AGRICULTURAL DEVELOPMENT IN THE WEST BANK

An economic and political study of the development of rain-fed farming in the West Bank

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Submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy

University of Bradford
Postgraduate School of Peace Studies
Studies in

1982

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ABSTRACT

The West Bank has a unique geography characterized by rough topography, eratic rainfall and scarcity of "available" irrigation water. About 96 percent of all cultivated area is dependent on rainfall, and because of severe restrictions on water use there is little scope for expanding irrigated agriculture in the near future.

Rainfed patterns of agriculture are characterized by low profitability, high risk margins and the need for large amounts of labour. This study has demonstrated that only a few patterns of rainfed farming (e.g. grapes, cantaloupe, sheep) are profitable at a commercial scale, where others command, at most, modest profit margins.

Development of West Bank agriculture is hampered by a severe conflict on local resources, especially land, water and labour. By exercising control on the West Bank's economic and institutional structures, Israel has been able to enact a wide range of policies bearing on land and water use, finance, marketing, and agricultural services, all serving Israel's interests, often at the expense of local inhabitants.

The argument for reactivating rainfed farming in the West Bank is justified more by political and sociological motives than by pure economic incentives. Accordingly, the cost for developing agriculture may be viewed as a national liability rather than an entrepreneurial activity. This entails strong commitments to provide ample finance at subsidized terms, establish stronger trading relations with Jordan, and provide more vigorous support to cooperatives, educational and research institutions.

This research describes a strategy for development of West Bank agriculture within a scenario of continued occupation, and describes institutional changes which are deemed necessary to facilitate agricultural development. It also contains a detailed list of projects and measures aimed at reactivating specific sectors of agriculture. The ensuing financial obligations for implementing the proposed developments are estimated at JD 20 millions, amortized over a period of three years. The researcher believes that anticipated returns warrant the projected costs.

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EQUIVALENTS

Measurements

1 kilometre	= 0.62 mile
1 metre	= 3.3 feet
1 kilogram	= 2.2 pounds
1 ton	= 1000 kilogram

Area

1 donum	= 1000 square meters
	= 0.1 hectare
	= 0.25 acre (approximately)
1 square kilometre	= 0.39 square mile

Currency exchange rates

1 Jordan Dinar	= 3.1 US Dollars
	= 1.4 Pound Sterling
	= 84 Israeli Pounds (average for 1979)

Currency components

1 Jordan Dinar	= 1000 Fils
1 Israeli Shekel	= 10 Israeli Pounds (Lires)

PART 1

CHAPTER I

CHAPTER I

INTRODUCTION

The West Bank is that part of mandatory Palestine which was annexed to the Hashemite Kingdom of Jordan in 1950, in the wake of the Arab-Israeli war of 1948-49 and the establishment of the State of Israel. The name is based on the fact that the said territory falls west of the river Jordan, whereas to the east of it lies the East Bank, the other part of the Hashemite Kingdom of Jordan.

The West Bank remained under the Hashemite rule for seventeen years until the Six Day War in June 1967 when it was totally occupied by Israel, in addition to the Gaza Strip, the Golan Heights and the Sinai Desert. Since 1967 the occupied territories have been governed by Israel through local military administrations affiliated to the Ministry of Defence in Tel Aviv.

During the course of the fourteen years under Israeli occupation, the West Bank has undergone a wide range of transformations which have touched on all its socio-economic institutions and facets of life. These changes have been so profound, pervasive, and unpredictable that they require comprehensive evaluation and constant monitoring by those Palestinian and international bodies which are concerned with the future of the West Bank and Gaza Strip. This study on West Bank agriculture is a contribution in that direction, since it deals with a sector which has a special significance in the country's economic, social and political life.

Agriculture is one of the most important sectors in the West Bank economy, whether in terms of its share of the Gross Domestic Product (often exceeding 30%) or share of the employed labour force (20-40%).

These criteria will be elaborated in a later section but it should be emphasized at this point that agriculture is by far the most important productive sector in the West Bank economy.

The importance of West Bank agriculture however, goes much beyond these indicators since it bears on important political and social considerations. This stems from the fact that agriculture is the largest reservoir and employer of the three most disputed resources on the West Bank: land, water and labour.

West Bank agriculture is characterised by the dominance of rainfed patterns of farming. This is most clearly exemplified by the fact that 95% of all cultivated land is rainfed, and only 4 - 5% is irrigated. The prospects of a sudden and substantial expansion in water resources available for Palestinian farmers is unlikely as long as Israel rules the occupied territories. This is one of the highly disputed issues on which Israel is unlikely to take, as long as it is not forced to, a flexible stand. Accordingly, the prospects for developing West Bank agriculture, at least in the context of a continued occupation, lie mainly in rainfed patterns of farming. This is why the researcher has focused his attention on this sector rather than on patterns of irrigated farming.

Objectives

This study is an exercise in development under a very unusual political setting. Over the past fourteen years Israel has had an almost free hand in the West Bank. It has instituted a wide range of measures and policies which are underlaid by two major motives: a gradual encroachment of land and water resources and an eventual major evacuation of local residents. Israel has gone some way towards achieving both of these objectives.

Conversely, Arab and United Nations interest in the Palestinian-Israeli conflict has been largely confined until a few years ago, to political rhetoric which has had very little impact on the realities of life in the occupied territories. But the situation changed in the late Seventies. In the first place a number of "voluntary" agencies, mainly American, started channelling modest funds, to agricultural and community projects, though in most cases these efforts were explicitly or implicitly resisted by Israel. In 1978 Arab leaders meeting in Baghdad decided to channel substantial volumes of aid to the occupied territories for the purpose of bolstering their "steadfastness". The assignment was delegated to an agency set up by those leaders under the name of the "Palestinian - Jordanian Joint Committee" (PJJC).

Another major move in the same direction was launched by the United Nations Development Programme (UNDP) which established a special Task Force representing the Economic Commission for West Asia (ECWA), the United Nations International Development Organisation, the International Labour Organisation (ILO), the Food and Agriculture Organisation (FAO), and the United Nations Development Programme (UNDP), with the assignment of "undertaking an initial identification of the social and economic needs of the Palestinian people and working out a list of national projects for meeting their needs in conformity with the General Assembly Resolution 33/147."

As soon as they commenced their activities, voluntary agencies, the PJJC, and United Nations bodies were all confronted with two major obstacles. First, Israel refused to cooperate and began to obstruct developmental effort which it considered conflicting with its own interests and policies in the occupied territories. Second, all

interested donor bodies were handicapped by weak communication channels concerning reliable sources of information and data. Israeli sources of information were either of a strictly statistical nature or were felt to be affected by political motives. Furthermore, conducting independent research required official approval, which was frequently conditioned by various pressures. Clearly enough, the development economist needs an accurate exposition of existing circumstances, problems and constraints, and actual needs and political pressures made this difficult to achieve.

Understandably, much of the interest displayed by Arab and international agencies has focused mainly on agriculture and rural development. Yet it is this sector which has suffered most from the lack of adequate studies and unreliable sources of information, for reasons which will be discussed under "methodology".

This study has come as a partial response to the afore-mentioned needs. Its primary objective is to ascertain and evaluate the problems and constraints which impede better exploitation of land and labour in rainfed areas. Consequently it attempts to put forth a developmental strategy which accomodates itself with the long-term national aspirations of the Palestinian people. Although it tries to provide ideas and courses of action conducive to a healthy and speedy development of rainfed agriculture, this study is not intended to be a substitute for more comprehensive feasibility studies of individual projects, nor is it conceived as a full-fledged developmental plan. These assignments are beyond the scope of this research.

To summarize, the present study is specifically addressed to achieve the following objectives:

1. An overall review of the role of agriculture in the West Bank

economy and social structure. This involves a critical evaluation of various transformations that have evolved since occupation in regard to production trends, land use, water resources and technological change.

2. Evaluation of infrastructure and institutional services bearing on agricultural development. Notable examples include agricultural extension, cooperatives, credit and marketing, and also voluntary agencies involved in rural development.

3. Diagnosis of problems which impede a more vigorous growth of agricultural production. This will include problems precipitated by natural constraints as well as those which have their roots in the more unusual setting of the West Bank as an area under occupation.

4. A profitability analysis of major patterns of rainfed farming. Such analysis will help to ascertain the relative profitability of selected farming patterns, identify the major cost components, and diagnose those production and marketing problems which hinder a more viable exploitation of available land and labour resources.

5. Formulation of an agricultural development strategy which takes into consideration the accumulated background information. The suggested strategy must be carefully coordinated to be consistent with the broader aspirations of the Palestinian people in establishing a viable and independent homeland in those parts of Palestine which might be evacuated by Israel in the context of a possible settlement.

6. Identification of those projects and measures which will be helpful in achieving strategic objectives of agricultural development. The proposed projects will only be presented and substantiated at a pre-feasibility level. More comprehensive feasibility studies would have to be conducted for individual projects prior to their implementation.

Much of the discussion along the points outlined above under objectives 1, 2, 3, and 5 will deal with the broader perspective of agriculture and rural development, whereas profitability analyses and development proposals will be confined only to rainfed patterns of agriculture. It is felt that irrigated farming sectors, though modest in acreage, are important and complex enough to deserve an independent study.

For the purpose of this study, rainfed farming includes all types of non-irrigated agriculture. As such it covers a wide range of fruit trees and field crops, as well as livestock and poultry, but does not deal much with citrus, banana and irrigated vegetables.

Methodology

In October 1979 the researcher temporarily left his post at An-Najah National University (Acting Chairman, Department of Economics) and joined the School of Peace Studies at the University of Bradford. He was registered there as a research student working for a Ph.D in rural development under the supervision of Dr Paul Rogers. A few months later, Mr Andrew Coulson of the Project Planning Centre at Bradford University was requested to help as a second supervisor.

During his first year of stay in Britain the researcher made a thorough review of pertinent literature and attended a number of courses. Besides making full use of the facilities available at Bradford University, the researcher visited several British universities and centres of oriental studies. During the course of the first year

he also made trips for similar purposes to the United States, Lebanon, Israel, and Jordan. (See Appendix 1 for a list of the visits undertaken for the purpose of this research in Britain and elsewhere.)

During his stay in Bradford the researcher managed to refine his proposed outline and then formulate questionnaires and schedules needed in the fieldwork. The questionnaires were translated into Arabic and field-tested on a small sample of respondents during the Easter vacation of 1980. They were then heavily refined back in Bradford and were put in the final form by the end of June 1980. Three questionnaires were used in recording responses of farmers interviewed in the profitability analysis survey, covering fruit trees, field crops, and livestock. English and Arabic versions of these questionnaires are reproduced in Appendix 2.

The second and perhaps the most important part of the field work consisted of interviews with a comprehensive sample of individuals who were well-informed on one or more of the sectors explored. This was envisaged to include extension agents, farmers, businessmen, academics, and members of local councils. For several practical and psychological reasons which will be discussed later it was decided to carry out these interviews without using a questionnaire form. Instead, a special list of questions was directed to each category of respondents and responses were recorded on plain sheets. The main theme which was sustained all through these interviews was the identification of technical, economic, and social problems facing certain forms of farming and hence the identification of those measures and policies which would respond to existing needs and constraints. (See Appendix 3 for a copy of each kind of question sheet used for the purpose).

The field work commenced in July 1980 and continued through August 1981, during which time the researcher was based at An-Najah University in Nablus. The contacts between the researcher and his supervisors were effectively maintained. In January 1981 he returned to Bradford for two weeks of consultation with his supervisors, and in April and July 1981 he was visited respectively by Dr Paul Rogers and Mr Andrew Coulson. In November 1981 the researcher visited again in Bradford for two more weeks of consultation.

During his year in the West Bank, the researcher proceeded in his field study more or less in accordance with set plans. His work was well received by all persons and organisations approached for cooperation. It was extremely gratifying to gain the confidence of respondents and solicit their cooperation in a particularly sensitive piece of research and under unusual circumstances. Being a local resident with a fairly well-known academic identity helped the researcher reach people and communities who would not otherwise be easily accessible.

Sampling

Sampling problems were encountered in two parts of the field work - profitability analyses and interviews of local experts. For reasons which will be explained below, in neither case was it possible nor advisable to adhere strictly to classical techniques of random sampling. In previous work the present researcher had used more authentic sampling techniques for at least two large scale surveys. In 1963-64 he conducted a poultry marketing study in Jordan involving a sample of 600 respondents. The sample was selected at random from a population properly stratified on the basis of location, income, and education.

The data was published in an M.Sc. thesis which was presented to

the Department of Agricultural Economics at the American University of Beirut in August 1964.[1]

In 1968 the researcher was commissioned by the Jordan Development Board to conduct a progress appraisal of the East Ghor Rural Development Project. With the help of eight field interviewers, it was possible to reach a sample of 220 farmers (about 7 per cent of total in the area). Sampled respondents were selected at random by picking every fifteenth name on the Land Registry list. The report on that study was published by the Cooperative Institute in 1968.[2]

In the present study, after a preliminary investigation of the relative significance of various types of rainfed farming it was decided to conduct profitability analyses for olives, almonds, grapes, wheat, barley, chickpeas, lentils, melons, sheep, cows, broilers and egg farms. Ideally it would have been preferable to select a sample which adequately accounted for variations in such attributes as size of farm, educational level of owners, and geographic distribution. But this was not strictly adhered to in this study. In the first place it was not intended to be a fully-fledged cost benefit study. It only aimed, in this connection, at presenting a fairly realistic picture of the profitability of those types of farming which constituted the backbone of West Bank rainfed agriculture.

More important, however, it was recognized that the selection of a

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1. Hisham Awartani, Marketing of Eggs and Broilers in Jordan, (M.Sc. thesis, American University of Beirut, 1964).
2. Hisham Awartani, Progress Appraisal of the East Ghor Rural Development Project, (Amman: Cooperative Institute, 1968).

large randomized sample lead to unusual problems arising from the fact that the Military Administration in the West Bank is excessively sensitive to all uncensored dealings with local communities. Conducting any form of social research requires a prior permit from the Military Headquarters, which is not, in practice, granted for an Arab. Infringements are likely to be taken seriously. A striking precedent was set in 1978 when a field interviewer (who was working for the present researcher) was detained for three months for "illegal activities".

In view of tangible security constraints, the researcher selected his sample of farmers in a way which would insure proper representation of just the dominant production trends in respective sectors, taking into consideration the obvious regional concentration of certain types of farming (over 90% of grains are produced in the Jenin disrict and 70% of grapes are grown in the Hebron-Bethlehem belt).

By the end of the summer of 1981 the researcher had interviewed for the profitability part of the study a sample of 120 farmers distributed as follows:

	Number of Farmers
I. Fruit Trees	
Olives	25
Grapes	15
Almonds	10
Total	50
II. Field Crops and Vegetables	
Wheat	10
Barley	5
Chickpeas	5
Lentils	5
Melons	10
Total	35
III. Livestock and Poultry	
Sheep (scavenger grazing)	10
Dairy Cattle	5
Broiler farms	10
Egg farms	10
Total	35
Grand Total	120

Notwithstanding security hazards, it would have been possible to reach a larger sample through the help of hired interviewers, but the researcher would then have been denied the opportunity of acquiring a deeper insight into the intricate and highly controversial profitability dynamics of West Bank rainfed agriculture. In the case of some less important types of farming (eg plums, apricots, and figs), the researcher procured profitability data from a study published by the Planning Section in the Department of Agriculture.[1]

Interviewing of local experts on the problems, constraints, and projected needs of their respective lines of farming did not involve sampling problems. During his fairly long stay and extensive travels in the country, the researcher was able to reach a large number of respondents representing all institutions and bodies involved in the process of agricultural development. Considerable attention was given to the technicians in the Department of Agriculture, cooperatives, and agricultural institutions. Commission agents and dealers of farm supplies also provided valuable information and interpretation of underlying trends. Heads of local councils, "mukhtars", and noted public figures provided useful information on the mechanisms and problems involved in channelling development funds from external sources to finance local needs. Several "sheiks " (Muslim authority figures) were interviewed on such matters as interest charges, female labour, and attitudes toward manual work.

The political setting of agricultural development was explored

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1. The Economics of Common Farming Enterprises (Beit Eil: Department of Agriculture, 1979).

with several Palestinian leaders inside and outside the West Bank. These politicians were interviewed on the subject of alternative settlement scenarios which they envisaged for the Palestinian-Israeli conflict. As argued later at length in Chapter X, it was decided to give priority to exploring the prospects of development under the present state of continued occupation. Development prospects under autonomy or independence do not command similar urgency and might duly be conducted through later independent studies.

Review of the Literature

This section contains a review of those books and publications which were of direct bearing on the topic addressed by the researcher. For the sake of clarity, cited literature is classified into various groups, whether in regard to its origin or purpose.

It is interesting to note that while university libraries are well endowed with studies on agricultural and rural development, even in some of the more remote countries of the third world, research on development problems in the West Bank and other occupied territories is scanty and inadequate for planning purposes. The problem stems essentially from the peculiar setting of these territories under a military administration which has strong reasons for restricting information on these territories, and more so for preventing any independent assessment of their development. In its endeavour to embargo "undesirable" research and publication activities, the Military Government has had many legal injunctions at its disposal, some of which date back to the British Mandate and the Ottoman rule of more than half a century ago.

Statistical references

West Bank statistics are handled exclusively by the Israeli Central Bureau of Statistics in Jerusalem (CBS), which commenced by conducting a census of population in September 1967[1]. The results of that census constitute the most comprehensive reference on the demographic and housing characteristics of the occupied territories, as they were shortly after occupation. Since then, the CBS has been entrusted with collecting and publishing a wide range of statistics on the West Bank and Gaza Strip. Collected statistics are published in two periodicals:

Administered Territories Statistics Quarterly and the Statistical Abstract of Israel. It should be emphasized, however, that in the researcher's opinion the validity of statistics collected by the CBS is not notably high[2]. Besides a lack of adequate staff and facilities, CBS personnel receive very little cooperation from a highly suspicious population. Nevertheless, the said publications remain the major source of statistics on the occupied territories, and most of their data are reliable enough to indicate general trends, which should then be further qualified through direct field contacts.

Much of the post-occupation data on areas and output of various types of farming and livestock statistics have been procured directly from the files and records available at the district office of the Department of Agriculture. Statistical information was also obtained from cooperative officials and agricultural schools.

1. Census of Population 1967, (Jerusalem: Israel Defence Forces and the Central Bureau of Statistics, 1968) - five volumes.

2. Sharp criticism of CBS data is also expressed by some Israeli researchers. A noted example is the Director of the West Bank Office in the Research Department at the Bank of Israel who expressed his critical views in a personal meeting with Vivian Bull. The latter related that remark to the researcher in a private meeting in the summer of 1980.

It should be noted that data obtained from Government offices were channelled despite strict orders not to release any information to anyone without prior consent of Israeli officials. Close personal relations with most workers in the offices of agriculture and cooperatives have been very helpful for the researcher in overcoming this difficulty. Needless to say, therefore, the researcher has a moral obligation not to identify, in writing, such sources of information. For this reason, it was decided to refer to the files of respective departments without a further indication to the source. Even this could entail some risk.

Pre-occupation data on the West Bank is available in reports released by Jordan's specialized government bodies, mainly the Department of Statistics and the Ministry of Agriculture. The former publishes an annual statistical yearbook and a large number of other specialized reports. Although population data was sufficiently detailed to give an overview of West Bank districts, economic data published by the Statistics Department was presented in a combined aggregate form which made it difficult to isolate the West Bank's data. Fortunately, this was not the case with production statistics released annually by the Ministry of Agriculture, which produced detailed annual data on acreage and output of all common types of farming in various districts. West Bank production data is available up until 1966.[1]

Israeli economic literature

The advent of Israeli occupation has stimulated a profuse amount of

1. Summarized in the Agricultural Atlas of Jordan, 1974, (Amman: Ministry of Agriculture, 1975).

economic research among Israeli intellectuals, journalists, and officials. This was particularly noticeable during the early years of occupation when many were attracted by the potentially far-reaching impact of occupation on the economics of Israel and the occupied territories themselves. Among the first pioneering studies in this field were those of Kanovsky[1] and Ben Shahar.[2]

The above mentioned reports dealt with the economic issues emerging after the 1967 war, with noted emphasis on their effects on Israel's economy under alternative political scenarios. Although of value to politicians and macro-economists, those studies command little value to researchers concerned with specific economic sectors, such as West Bank agriculture.

A prominent source of information on West Bank economic structure is the Research Department in the Bank of Israel, which has established a special office for monitoring the economics of the occupied area. The former director of this office, Arie Bregman, published a series of two reports in the early seventies under the title of "The Economy of the Administered Areas".[3] Bregman's reports were widely quoted and have become major references on the subject, especially for foreign researchers.

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1. E Kanovsky et al: The Economic Impact of the Six Day War, (New York: Praeger, 1970).
2. H Ben Shahar et al: Economic Structure and Development of the West Bank and Gaza Strip, (Santa Monica: Rand Corporation, 1971).
3. Arie Bregman, The Economy of the Administered Areas, (Jerusalem: Research Department in the Bank of Israel, 1973 and 1974).

Though more reserved than publications published by the Military Headquarters, Bregman's reports are also characterized by a somewhat propagandist image. His estimates of economic growth, supposedly around 18 percent per annum (at fixed prices) have been criticized for over-optimism. Van Arkadie, for example, believes that the real figure may not exceed 9 percent. (This point will be elaborated further in Chapter 5).

The least authentic sources of information on economic transformation in the occupied territories are those released by the Military Headquarters at Beit Eil. The Military Command appears obsessed with portraying its rule in the occupied territories as a historic blessing which has brought about a revolutionary advance in what previously was a backward economy with a retarded standard of living.[1] Much has been published on that theme by various specialized departments at Beit Eil and by the Israeli press. Among the least modest of all are reports published by the Department of Agriculture in the Military Command. A recent publication by the chief of the Planning Unit in the Department of Agriculture estimates a rate of growth in agriculture income during 1968-76 at 15.5 percent and proudly concludes that such a rate of growth is "unparalleled in the world."[2]

Foreign Literature

Foreign interest in the West Bank's economy has been much less profound than in its politics. Although a great many articles

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1. Example: "The years of Israeli administration have already produced the period of greatest prosperity in the history of the West Bank and the Gaza Strip". Source: Information Briefing 28: Facts about the Administered Areas (Israel Information Centre) p 24.
2. Moshe Levi, Development of Agriculture in Yehuda and Shomron, 1967-76, (Beit Eil: Department of Agriculture in the Military Headquarters, 1978), p 1.

have been written on the impact of occupation on the West Bank's economic resources (water, land and labour), the vast majority of work has been of a journalistic style, intended largely to substantiate the authors' judgements on the nature of Israeli occupation. But there are several exceptions, such as the work of Van Arkadie, Vivian Bull, Tuma and Drabkin, and Wilson.

Van Arkadie's book[1] was written in 1975 on the basis of some weeks of fieldwork in the West Bank. As spelled out in its title, it is concerned mostly with evaluating positive and negative consequences of Israeli occupation on the economics of Israel and the territories in question, the West Bank and Gaza Strip. Van Arkadie makes the important distinction between short-term and long-term economic consequences. While he demonstrates that economic benefits of occupation to Israel outweigh costs encountered, he points out that the impact on the occupied territories themselves is far more mixed and intricate. In the short term the two territories (West Bank and Gaza) have achieved rather high rates of growth although he believes growth was much less spectacular than Israel's claim (see later section on post-war economics).

On the other hand, the long-term impact on the territories, as viewed by Van Arkadie, is much less encouraging. For example, he points in the last chapter of his book to the following conclusions: "Because local industry does not enjoy the benefits of protection from Israeli competition, or access to Israeli subsidies, the

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1. Brain Van Arkadie, Benefits and Burdens: A Report on the West Bank and Gaza Strip Economics Since 1967, (Washington: Carnegie Endowment for International Peace, 1977).

growth of some sectors of the territories' economies will be stunted."[1]

"Purely economic interests of the two territories would be well-served by some major modifications in the prevailing network, and without such modifications and without reorientation of present trends, both territories' economies face a prospect of qualitative deterioration in some sectors."[2]

"Indeed the existing situation itself may be economically disadvantageous for the territories over the long-term for the reasons suggested in this study."[3]

Although Van Arkadie's critical evaluation of the occupation's economic consequences of the West Bank and Gaza Strip is expressed in various subtle ways all through his book, the reader is left with the impression that the writer would have had more to say had it not been for the constraints of "fairness" and "even-handedness" implicitly attached to his terms of reference by his American sponsor.* Furthermore, Van Arkadie could have produced a more illuminating study had he been able to reach primary sources of information.

Vivian Bull's book, "The West Bank - Is it Viable?"[4] is a re-written version of a Ph.D. thesis which she submitted in 1974 to New York University Graduate School of Business Administration. Going further beyond the question of viability, the author gives a brief

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1. Ibid, p 142.
2. Ibid, p 146.
3. Ibid, p 154.
4. Vivian Bull, (Lexington - Massachusetts; Lexington Books, 1975).

* Carnegie Endowment for International Peace.

exposition of the political history of the area and a description of various institutions bearing on the process of economic development.

Bull's views on the historical, social and cultural transformations are often sketchy, and sometimes inaccurate. For example, not many would agree with her categorical condemnation of workers in rural areas that they "have ingrained attitudes of distaste for manual labour, even if it is of a technical nature."[1] Her contentions about the impact of Islam on social and economic change are also questionable. She interprets Moslems' spiritual conviction that God is the ultimate Cause of change and Mover of man as "willingness to subscribe almost anything to the will of Allah."[2] In the researcher's opinion Moslems would consider this not only a wrong conception, but also insulting.

Bull's review of West Bank agriculture is the book's weakest spot. After she sums up change in West Bank agriculture during the early years of occupation as "the beginnings of an agricultural revolution"[3], she cites numerous examples based on casual observation, repeatedly describing the remarkable progress achieved under Israeli guidance, giving little attention to pre-67 developments or to post-67 weaknesses. Evidently, Bull drew heavily on the opinions she was offered by the senior officials in the Military Administration. In contrast, she made very little use of primary sources of information, such as farmers, businessmen and local officials.

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1. Vivian Bull, (Lexington - Massachusetts; Lexington Books, 1975).
2. Ibid, p 32.
3. Ibid, p 73.

Bull's analysis of economic viability is the best part of her book. She describes at length the inherently ambiguous definition of viability, and notes that:

"If economic viability refers to a basic independence of foreign aid, then few developing nations would be considered to be economically viable. If the term applies to the balance of payments deficit, again few countries would be viable."[1]

In the light of her argument on the noticeable ambiguity of viability concepts and their intricate connection with several other variables, Bull concludes that the West Bank (she makes no mention of Gaza Strip) may prove economically viable but not independent. Consequently, it will have to develop strong economic ties with its neighbours, especially with Jordan and Israel. In the very last paragraph of her book, Bull asserts that "the future of the Middle East lies in the establishment of peaceful regional development. A Palestinian region might be the first building block in such a scheme."[2] That appears to be a call for establishing a Palestinian state.

A less reserved view on the question of viability is expressed by Tuma and Drabkin, and Collard and Wilson. Tuma and Drabkin[3] have embarked on the formidable task of outlining a blue-print for a Palestinian state consisting of the West Bank and Gaza Strip. They argue that such a state could be made viable enough to support an eventual population size of about three million. With the aid of

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1. Ibid, p 12.
2. Ibid, p 152.
3. Elias Tuma and Haim D Drabkin, The Economic Case for Palestine (London: Croom Helm, 1979).

estimates derived from comparable international data, Tuma and Drabkin project the capital outlay needed for rehabilitating a Palestinian state of about 2.8 million inhabitants at £8.5 billion (1975 prices) over a transition period of five years following its inception.[1] This, they emphasize, is a modest price for reaching justice and peace in Palestine.

Elizabeth Collard and Rodney Wilson[2] adopt basically an identical argument, but shed more light on the repressive nature of Israel's economic policies in the West Bank and Gaza Strip. Much of their essay is devoted to giving ideas on what they conceive as major projects for stimulating vigorous development in the anticipated state. According to their projections, the capital outlay required for this purpose during a transitionary period of five years is in the range of £8000m ($16,000m) which they also consider within easy reach, should political constraints be removed. Wilson, and Collard, and Tuma and Drabkin believe that it will be relatively easy to shoulder the economic cost of a Palestinian state on account of a long-standing commitment of parts of the world community to do justice to a dispossessed nation, and in view of the enormous wealth of the Gulf states which have additional commitments toward the land of Palestine and its fellow Moslems.

Local Literature

Israel assumed full control on all public institutions in the occupied territories immediately after occupation. Consequently,

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1. Ibid, p 93.

2. Elizabeth Collard and Rodney Wilson, The Economic Potential of an Independent Palestinian State, (London: Middle East Economic Digest, Vol II, 1975).

all activities of public research institutions have been either severely curtailed or altered in ways which would render them ineffectual in meeting development needs of the territories themselves. And because of the relatively late emergence of local universities, the occupied territories had little research done by local experts throughout the first decade of Israeli occupation.

The late seventies witnessed the emergence of three universities in the West Bank. Initially, the new universities did little to meet the mounting research needs in various fields, because they were too deficient in qualified teaching staff to be able to initiate and sustain a rigorous research program. Although their recruitment position has improved over the last two years, research efforts of West Bank universities are heavily restrained by opposition from military authorities. Besides forbidding government staff from releasing any information or data without prior consent, senior Arab officials are explicitly instructed not to welcome outsiders to their offices for non-routine work. Not surprisingly, therefore, the contribution of West Bank universities in this field has been extremely limited and thus far it is restricted largely to a report on West Bank agriculture written by the present researcher and published by An-Najah University in 1979.[1] Although it helped to shed some light on several problems and issues, the said report was brief and lacking of supportive field research.

Most recently (September 1981) four papers were produced by local experts and were presented in a seminar on agricultural development sponsored by the Arab Thought Forum. These papers were by

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1. Hisham Awartani, West Bank Agriculture: A New Outlook, (Nablus An-Najah National University, 1979).

Abu Kishek[1], Awartani[2], Tayeh[3], and Abu Arafeh[4].

Although not of a particularly high quality, these papers provide a useful addition to a very limited library. The common theme in all of them is to describe the various forms of damage inflicted on West Bank agriculture as a result of Israeli occupation. Although they offer broad recommendations on ways and means which could help reactivate respective sectors, none of these papers provides an adequate basis for the purpose of initiating or accelerating growth in the West Bank agriculture. The danger is, in fact, that local researchers display an excessive desire to compile charges against Israel for its "wrong-doings" in the area, and thereby promote apathy. The present researcher believes that local researchers have a distinctive advantage in being present in the West Bank. As such they should undertake the more critical assignment of conducting problem-oriented research addressed to meet felt needs instead of diverting their scanty resources to rhetoric.

Arab Literature

Literature on the West Bank's socio-economic life during the Jordanian rule is extremely limited. This appears due largely to Jordan's opposition to any activity which would help nourish

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1. Bakr Abu Kishek, West Bank Land Problems and Development Prospects (Jerusalem: Arab Thought Forum, 1981).
2. Hisham Awartani, Water Resources and Politics (Jerusalem: Arab Thought Forum, 1981).
3. A H Tayeh, West Bank Horticulture - Present and Future (Jerusalem: Arab Thought Forum, 1981).
4. A R Arafeh, Livestock Sector of the West Bank (Jerusalem: Arab Thought Forum, 1981).

a resurgence of Palestinian identity in the West Bank. With the exception of some purely technical work done in agricultural research stations (mainly on irrigated vegetables), most developmental research was confined to the East Bank itself.

Jordan developed a new interest in West Bank's economy and resources after it was taken over by Israel in 1967. This responsibility was delegated to the Economic Department of the Royal Scientific Society (RSS), which has produced five papers during the past six years.[1]

With the exception of their publications on West Bank economic resources (see list in the footnote), all RSS publications on the occupied territories are merely interpretations of data released by the Central Bureau of Statistics (CBS). In this respect, they prove no less deficient than foreign researchers, in fact maybe more so, since they refrained from sending researchers to the territories and they made inadequate use of resident sources of information. Nevertheless, RSS interest in the economics of the occupied territories meets a felt need for politicians on the Arab side of the conflict, by providing them with a large volume of background information.

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1. a. M A'mireh, M, et al, The Impact of Israel's Economic Policies on the West Bank and Gaza Strip, (Amman: Royal Scientific Society, 1978).
   b. Anonymous, The Economics of the Occupied Territories, (Amman Royal Scientific Society, 1975).
   c. Anonymous, Economic Resources of the West Bank and their Impact on the Israeli Economy, (Amman: Royal Scientific Society, 1979).
   d. Anonymous, The Hostage Economy, (Amman: Royal Scientific Society, 1981).
   e. J Salem, Agriculture, Land and Water Resources of the West Bank, (Amman Royal Scientific Society, 1981).

Expectedly, the Palestine Liberation Organization (PLO) has displayed considerable interest in researching various development in the occupied territories. To help pursue this interest in a systematic manner, the PLO established its own Research Centre in Beirut. One of the most authoritative references on the West Bank's socio-economic transformations during the Jordanian and early Israeli rules is the book by Jamil Hilal which the PLO published in 1975.[1]

Hilal's analysis of the West Bank's demographic and economic transformations which were precipitated during Jordan's lop-sided and often oppressive rule is fascinating and has become a major reference on the economics and social history of the area during that period. Though his coverage of the post-occupation era is partial (1967-74) he has, nevertheless, produced a comprehensive analysis of developments taking place shortly following occupation. He describes at length the evacuationary character of Israeli occupation, which he believes is a distinctve feature compared with classical forms of colonialism. He therefore demonstrates that Israel's policies in the territories, especially those related to their economies, are intended in the end to achieve the Zionist dream of absorbing all the land of Palestine within the Biblical Eretz Israel.

Hilal's book is an original contribution to the political history of the West Bank, as viewed by a Marxist historian. The only

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1. Jamil Hilal, The West Bank: Social and Economic Structure, 1948-74, (Beirut: Palestine Research Centre, 1957).

reason why it has not gained wider publicity in the Middle East is that it is available only in English.

Notwithstanding Hilal's deep insight into the political background of West Bank economics, including the agricultural sector, it is clear that the book falls far short of analyzing the situation of individual farming patterns. Furthermore, as its author had been deprived of access to primary sources of information, he also has had to rely almost exclusively on Israeli data for his treatment of the post-occupation era. Accordingly, the usefulness of the book as a reference for planning agricultural development is limited, but it remains an invaluable reference on the West Bank's political economy during a sensitive period of its history.

Rainfed Agriculture

The researcher has had access to a large number of technical papers dealing with the various aspects of rainfed farming. Among the most valuable references in this respect were the papers submitted to the FAO Regional Seminar on Rainfed Agriculture, held in Amman in September, 1979. Through the courtesy of FAO's Regional Office in Cairo the researcher received copies of all 37 papers presented in that seminar. Some of them were very useful, whether as sources of information or new ideas. Prominent examples are:

N R Carpenter: An Outline Proposal for a Systematic Approach to the Development of Rainfed Areas of the Near East.

Ch Krishnamoorthy: Cropping Systems for Optimum Utilization of Resources under Semi-arid Concitions.

David Gibbon: An Approach to the Improvement of Rainfed Agriculture Systems in the Medeterranean Region.

A J Smith: The Integration of Livestock into Rainfed Agricultural Systems.

H M Sawaf: Attempts to Improve the Supplementary Irrigation Systems in Orchards in Some Arid Zones.

M C Simpson: Socio-economic Aspects of Rainfed Farming.

S Shamout: Jordan's Experience in Rainfed Agriculture.

Many other technical papers were procured from Israeli sources. Among the most useful were the papers obtained from the Centre for Horticultural Research at the Volcani Institute in Israel.[1]

Literature specific to olives is not scarce, though it rarely embodies tangible breakthroughs anywhere similar to those in, for example, irrigated agriculture or livestock husbandry. The West Bank Department of Agriculture published two extension papers on recommended cultural practices, which were translated from old Hebrew pamphlets. This is evident, for example, in their unwarrented recommendation for repeated ploughing of olive orchards, with total disregard to costs. Birzeit University has published a study which deals with socio-economic implications of olive culture in Palestine.[2] This report is rather journalistic and avoids discussion of technical details.

The most authoritative review on Palestine olives is certainly the book by Nasouhi Taher on The Olive Tree.[3] This book of over 300 pages was written in the forties by one of the most reputable

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1. Noted examples (all published by Volcani Institute, Bet Dagan, Israel):
   a. A Blumfeld et al, Ethylene Treatment and Abscission of Olive Fruits.
   b. S Lavee et al, Studies with Ethephron for Facilitating Olive Harvest.
   c. I Klein et al, The Effect of Nitrogen and Potassium Fertilizers on Olive Production.
2. Somaya Nasser, Palestine Olives (West Bank: Birzeit University, 1979).
3. Nasouhi Taher, The Olive Tree (Jaffa: Taher Library Press, 1945).

experts on olives. It contains an extensive volume of information on areas and production, varieties, cultural practices, common pests, pressing techniques and marketing problems. A large section of pages is devoted to describe its literary and religious values to Arabs, Moslems and Christians.

Despite its outstanding reputation which has lasted for many years since it was first published, Taher's Olive Tree has not been updated or revised since it appeared in 1945. In view of the massive technological advances in agriculture during the last three decades and drastic changes in the input/output price relationships, it has lost much of its real value as a reference on the technology and economics of olive culture, though, it certainly remains a respected landmark in the economic and cultural history of Palestine.

A particularly useful reference on the actual planning of rainfed agriculture is a series of district reports on the socio-economic feasibility of developing rainfed agriculture in Jordan. This set of studies was conducted by a team of highly qualified technicians under the auspices of the Arab Organization for Agricultural Development.[1] Evaluation tools were largely drawn from Gittinger's book on Economic Analysis of Agricultural Projects.[2] Many of the ideas envisaged by the AOAD team proved useful to the researcher in formulating specific schemes for developing the West Bank's rainfed agriculture.

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1. An example on this set is the following:
   A Technical and Feasibility Study of Rainfed Agriculture in Balqa and Irbid Districts, (Khartoum: Arab Organization for Agricultural Development, 1978).
2. J P Gittinger, Economic Analysis of Agricultural Projects, (London: The Johns Hopkins University Press, 1977).

CHAPTER II

CHAPTER II

THE GEOGRAPHY OF THE WEST BANK

A study of West Bank agriculture bears directly on many of its geographical attributes, since many of these attributes help define the physical and human resources which are deployed in this sector. The impact of the area's distinctive physical features on its agriculture, as we shall see later in this chapter, has always been crucial in determining the pace of agricultural development, especially when this is viewed on purely economic grounds.

Similarly, the process of agricultural development is influenced materially by a number of demographic and sociological attributes of population, such as growth rates, age and sex composition, and education. This chapter presents a brief exposition of the physical and human geography of the West Bank, with particular emphasis on their interaction with agricultural production. The earlier part on physical geography includes a discussion of the physical attributes of land and water resources. The political ramifications of both of these resources will be explored in chapter III in a discussion of the politics of development.

Physical Geography

Location

The West Bank is located in the interior middle regions of Palestine about 16-40 kilometers away from the eastern shores of the Mediterranean. It falls between longitudes $30^{\circ}5$ and $31^{\circ}4E$. Despite a relatively long Palestinian coast line the West Bank emerged in 1949 as a totally land-locked region. It is surrounded by Israel to the north, west, and south, and by Jordan to the east (see Map 1).

Map No. (1)

Regional location of the West Bank

Evidently, the location of the West Bank entails several economic difficulties and political hazards which will have to be tackled by any future Palestinian state consisting of the West Bank and Gaza Strip. On one side the two territories are separated by over 60 kilometers of "Israeli" land, while on the other, Jordan lies as the only gateway for their vital connections with the rest of the Middle East. The political implications of both facts are significant.

Area

The total land area of mandatory Palestine was 26,192 square kilometers. The United Nations Resolution No 181 of 1947 demanded the partition of that area into two political entities, one Arab occupying 43%, and the other Jewish occupying 56.5% of the total area.* However, Israel was able to occupy a wider area during the course of the 1948 war. Several months later, Israel was able to reach an agreement with Jordan, which was then the "custodian" of West Bank land and people, whereby the former stripped the West Bank of all its remaining coastal plains, estimated at an area of 450 km^2[1]. The area surrendered in this process was so rich in water resources and of such a topography that it would have increased irrigated farming in the West Bank by four times had it not been lost. Instead, it was left with a strikingly mountainous topography which, as we shall see later, may prove to be the most serious constraint for the development of West Bank agriculture.

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1. This agreement was reached in the famous Armistice Treaty between the two governments in 1949 on the island of Rhodes.

* The rest was to be left under U N mandate.

At the end of the armed hostilities and subsequent ceasefire talks in 1949, mandatory Palestine was divided into three separate political entities with the following areas:

	Square Kilometers	Percent of total
Israel	20,258[1]	77.3
West Bank	5,572[2]	21.3
Gaza Strip	362[3]	1.4

The area of the West Bank, as reported above, includes the area of East Jerusalem (67 square kilometers) which was annexed to Israel two weeks after occupation.[4]

In June 1967 Israel achieved a major victory in a brief war with Syria, Jordan and Egypt. In the aftermath of that war, Israel was able to stretch its borders considerably by occupying the Golan Heights, the West Bank, Gaza Strip and Sinai Peninsula. The new ceasefire lines encompassed an area of 89,359 square kilometers,[5] which is more than four times larger than the area of pre-67 Israel (see Map No 2).

Topography

The West Bank consists of two major topographic regions: the Palestinian Hills and the Jordan Valley. The Hill Region extends from Jenin in the north to Hebron in the south (see Map No 3).

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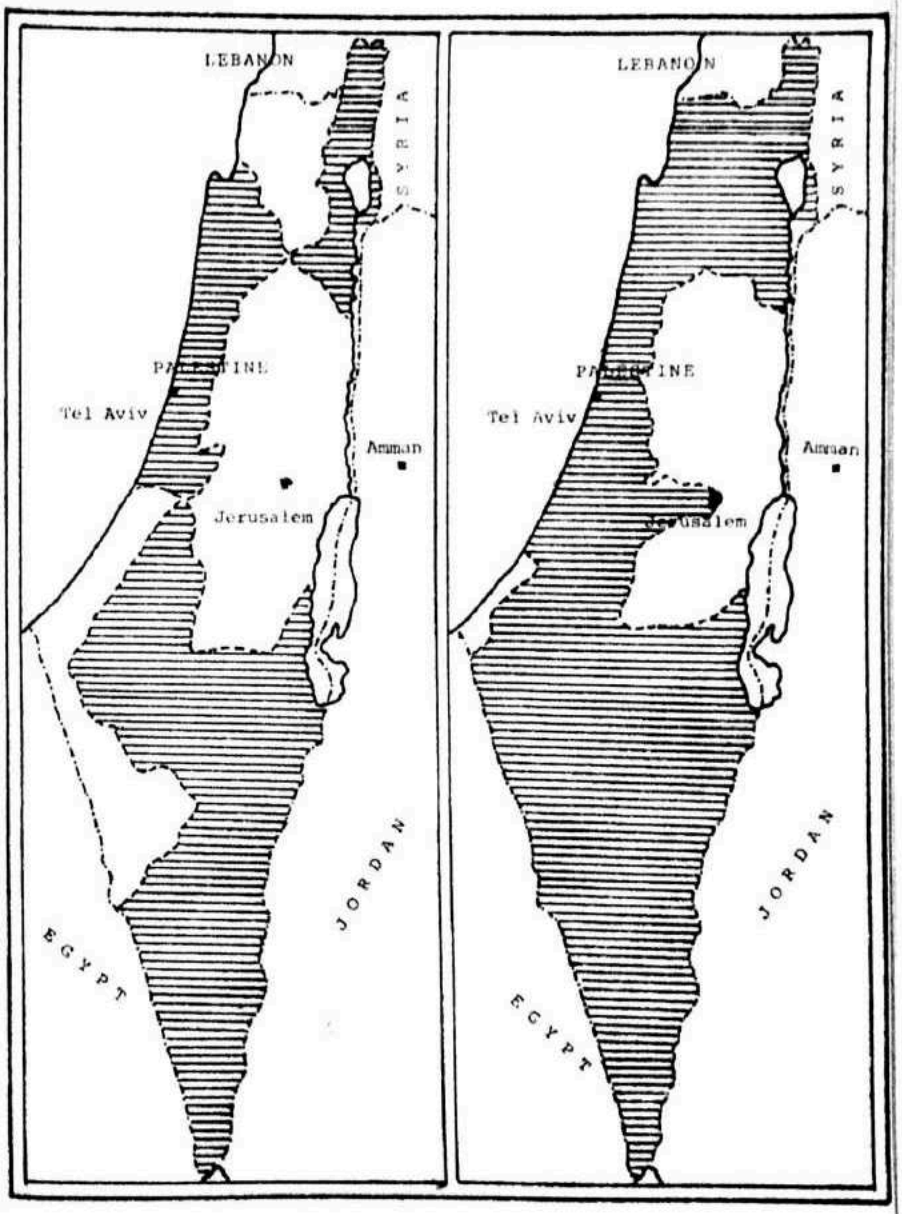
1. Statistical Abstract of Israel, (Jerusalem: Central Bureau of Statistics, 1980) p 16.
2. Ibid.
3. Census of Population, 1967 - West Bank and Gaza Strip, (Jerusalem: Central Bureau of Statistics, Publication No 1) p ix.
4. Census of Population and Housing, 1967 - East Jerusalem, (Jerusalem: Central Bureau of Statistics) p xi.
5. The Statesman Yearbook 1979-80, (London: The Macmillan Press), p 711.

Map No (2)

PALESTINE

Partition Plan



Post 1967 War

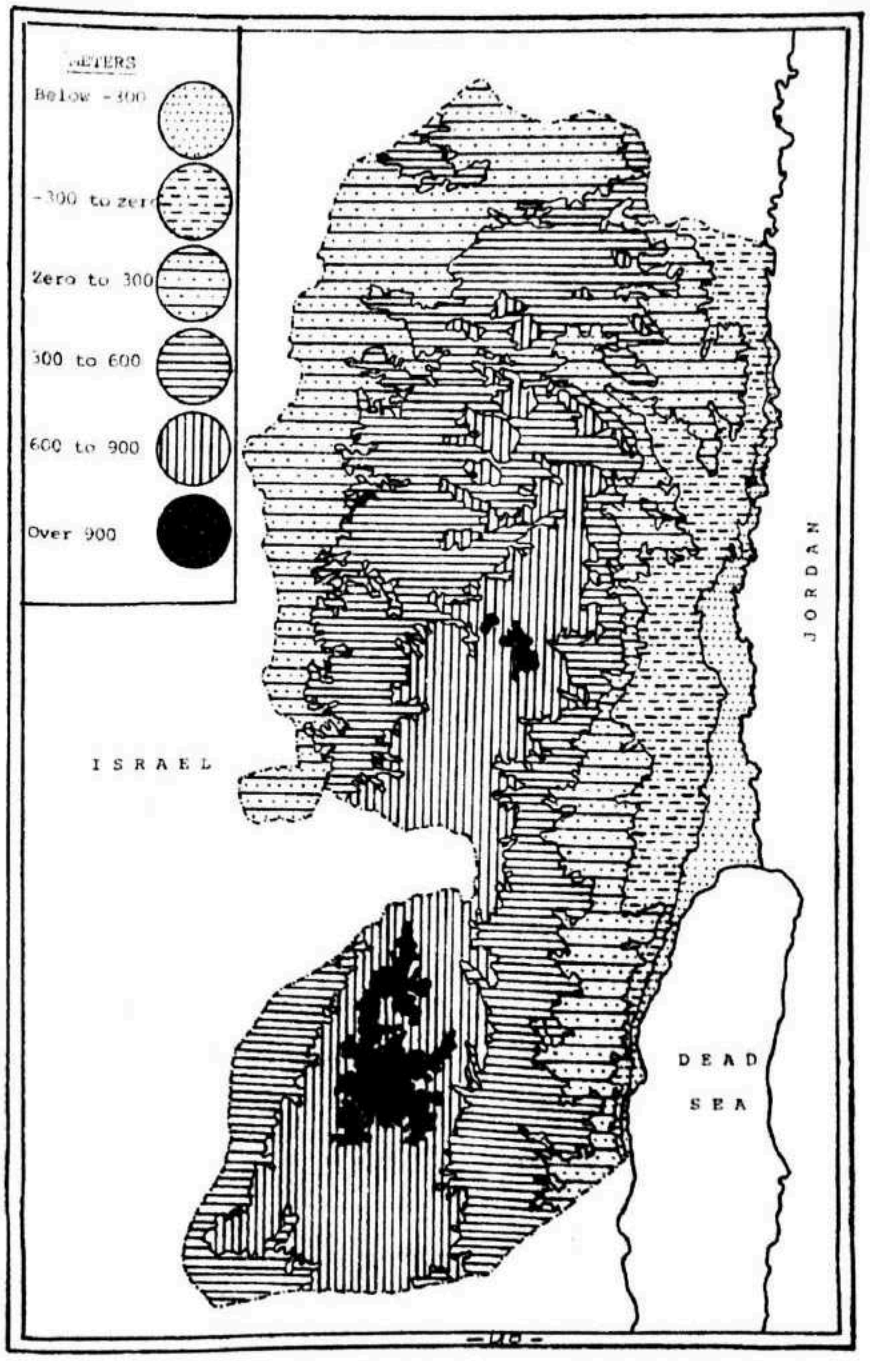
The northern part, known as Nablus Mountain consists of upfolds intertwined with internal basins, valleys, and isolated mountain blocks. Although this region is predominantly mountainous, tectonic uplifts of mountain blocks have resulted in the formation of relatively large stretches of plains extending between neighbouring hills. Notable examples are the plains of Libban, Howara, Sanour, Ya'abad, Deir Sharaf, and Anabta. The fertile soil (mostly terra rosa) and gentle slope of these areas permit patterns of farming which are much more intensive than that possible on adjacent slopes.

The structure of the southern hills, extending from Sinjel (midway between Nablus and Ramallah) to Hebron in the south, is more simple. It consists of a compact upfold or dome with only minor faults. Although no plains exist in the Hill Region, relatively large areas of gentle slopes extend over the plateau connecting Ramallah and Jerusalem. Hard limestone and dolomite rocks prevail in the higher parts of the hills, making commercial agriculture very difficult.

Western foothills are characterized by a gentle slope, softer chalky rocks, and a rainfall of 450 - 750 mm. This has permitted the use of modest indigenous forms of vegetation and animal life which help support a relatively dense population. It is such hills which constitute the bulk of cultivated land at the present and possess the potential for further expansion in agricultural production and rural settlement.

Eastern foothills are characterized by a much steeper slope and the impermeability of their chalky rocks. Absorption of rainwater by top rock layers is very low, which results in rapid surface runoff and active erosion. The flank of the upfold is broken by a number

Map No. (3)
Relief map of West Bank



of high steps along the parallel fault line intersecting the Rift Valley.

The eastern slopes fall in the rain shadow area, hence the rainfall decreases sharply from west to east. The north-eastern foothills are not noticeably arid, with a rainfall of over 250 mm in most years, which makes certain types of farming reasonably economical. A prominent example is found in the Tubas hills in the north which constitute a major grain and sheep production area. But rainfall decreases to less than 200 mm towards the south, which renders land fit merely for occasional grazing by goat and sheep flocks.

The Rift Valley lies along the eastern border of Palestine and it is a part of the great Syrain-East African Rift caused by uplifting and folding movements by the rock crust. The Jordan river passes through the middle of the Valley, connecting Lake Keneret and the Dead Sea. It was established during the British Mandate as the international borderline separating Trans-Jordan and Palestine.

The West Bank side of the Rift is a narrow strip 15 - 32 kilometers wide and 75 kilometers long. It drops in latitude from 270 meters below sea level in the north to 390 meters at the Dead Sea near Jericho. The Valley bottom is mostly covered with lissan marl deposited in the ancient Jordan Lake with many deep crevices and canyons.

Soil

Despite its small size the West Bank contains a wide variety of soils. In the upper hills of Hebron, Jerusalem, Ramallah and Nablus,

where surface rocks are of limestone origin, the dominant type of soil is the Mediterranean "terra rossa". Due to the high solubility of calcium, terra rosa contains only 5 percent or less of calcium, whereas it contains 50 percent of silica and 10 - 15 percent each of alumimium and iron.[1] This kind of soil is well suited for farming. But due to its marked vulnerability to erosion and the very long time it takes to generate (on the average, 1000 years to form one centimeter), cultivation on hills with a terra rosa soil requires elaborate protective precautions. This includes the construction of expensive retaining walls and the growing of deep-rooted trees rather than field crops and vegetables.

In areas with soft chalk rocks, "rendzina" soil is formed through weathering processes. This is noticeably different from the terra rossa soil, since it has a higher calcium content and a more friable structure, but it is inferior in fertility. In general, though, it is deeper than terra rossa and less affected by runoff. As such, the rendzina soil can support a wider variety of cropping patterns. This kind of soil is dominant in the western foothills of Jenin, Tulkarm and Ramallah.

Soils in the Jordan Valley are different from both previous types. Due to an extensive marl cover, the soil there is characterized by high salinity (gradually increasing southward) and a clearly alkaline pH. Salinity is made worse by the high salt content of shallow tube wells drilled by Palestinian farmers prior to occupation. But in those cases where it was possible to wash

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1. E Orni and E Efrat, Geography of Israel, (Jerusalem: Israel Universities Press, 1973), p 57.

out part of the soil content by ample use of "sweet" water, Jordan Valley soils proved extremely fertile and gave record yields. Due to its mild topography, abundance of underground water, and its exceptionally warm winter the Rift Valley was put, prior to occupation, under very intensive farming and had become Jordan's most important production area for vegetable crops, citrus and banana. For purposes of dry farming, however, this region is of little value given the present level of technology and market structure.

In general, soil quality in most rainfed hill slopes is of such marginal depth and fertility and is so vulnerable to runoff that much has to be done to avoid the hazards posed by these constraints.

Climate

By virtue of its geographical location near the equatorward border of the Mediterranean Zone, the West Bank is characterized by an extreme Mediterranean climate. This basically means a comparatively short rainy season of 3-4 months and a long rain-free summer. Seasonal variations in the length of day and night are moderate, ranging from 14 hours for the longest day (June 21) to ten hours for the shortest (December 22), as compared to 18 and 6 hours respectively, in London.

Insolation rates (duration of direct exposure to sunlight and intensity of sunlight) are particularly high. Insolation is further strengthened in the summer by almost completely clear skies.

These characteristics, together with high summer temperatures have important consequences for agricultural patterns, as we shall

explore at length in a later section.

Temperature

As a result of strong insolation, temperatures are comparatively high but they vary considerably from one region to another, depending on altitude, exposure to marine influence and wind directions.

There are generally three distinctive isothermic regions in the country: western foothills, the hilly plateau, and the Jordan Valley. The former registers an annual average of 20°C (68°F), the hills 17°C (63°F) and the Jordan Valley an average of 25°C (77°F). January is normally the coldest month and August is the warmest (see Table II-1).

Table (II - 1)

Monthly average temperatures in January and August

	January		August	
	°F	°C	°F	°C
Western foothills	53.5	12	77.0	25
Hills	48.5	9	75.5	24
Jordan Valley	55.0	13	87.5	31

Source: Orni and Efrat, op cit, p 135.

The impact on agriculture of high summer temperature, occasional heat waves, hail storms, and frost is very grave, particularly more so on olives and other rainfed fruit trees. This will be analyzed later under respective sections.

Wind

The East Mediterranean coast is influenced by a number of winds, cyclones, and anticyclones. Among the most hazardous to agriculture, however, are the "khamaseen" and "Sharav" winds.

The Khamaseens result from a barometric low over Libya or Egypt and they are characterized by a sudden rise in temperature (over 15°C) accompanied by a shapr drop in relative humidity (below 20 percent). Khamaseen heat-waves may start in April and recur several times through the summer without any fixed pattern. Their intensity and duration may vary considerably but they often last for two to three days, and sometimes for much longer. The Sharav winds, on the other hand, are caused by a high pressure developing over the area itself where the subsided air is compressed and heated. Their incidence is most common in the beginning and at the end of winter. Again, the Sharav winds may cause a sharp rise in temperature (by 15°C or more) and a substantial drop in relative humidity (by as much as 40 percent). Towards their peak, Sharav conditions are accompanied by fine dust and hot dry winds.

The Khamaseen and Sharav winds constitute a major problem for rainfed patterns of agriculture. Most dangerous in particular are the hot spells which occasionally blow in April, coinciding with the blossoming season of olives. Being small and very sensitive to weather abberations, a large proportion of olive blossoms and newly set fruits are vulnerable to desiccation under high temperature andlow humidity. As the danger period is fairly long, extending usually from April 10 to May 15, the damage caused by hot spells is almost unavoidable. The question, however, is one of severity, ranging from a mild, and probably useful, drop of a reasonable proportion of olive flowers, to a disastrous and nearly total desiccation of blossoms. While West Bank olive growers realize fully the hazards posed by hot spells setting in at the wrong time, there is little they can do in this regard.

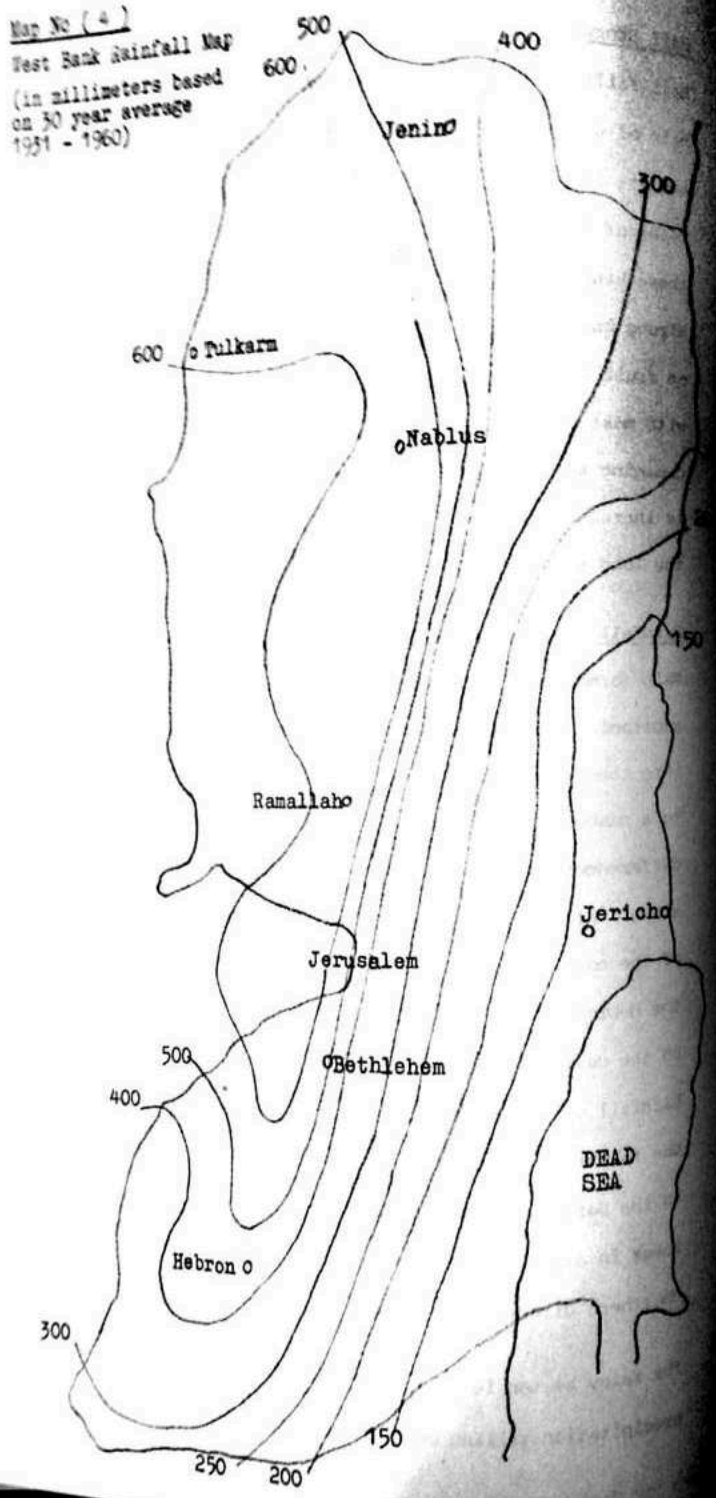
Hail Storms

Hail falls on the West Bank for four to seven days during the latter half of winter (February-March). Again the timing of hail fall and its intensity are of tremendous consequences for several types of fruit trees, notably almonds, apricots, and plums. As these kinds of trees blossom and set their fruits in February, a strong hail storm blowing at this time may inflict severe damage on fruit trees in the area. The hazards posed by hail storms as with most other phenomena discussed earlier, are particularly damaging to dry farming patterns. Irrigated farming, in contrast, is increasingly less vulnerable to weather problems in view of the long strides achieved in protected farming.

Rainfall

Rain formation in the West Bank follows the sudden change from the subtropical to the cyclone belt in autumn, and back again in spring into the former zone. Rain distribution and intensity is subject to a number of factors, such as proximity to the Mediterranean, differences in altitude, exposure to sea winds, and the angle of slope. All of these factors are reflected on the rainfall map of the country (see Map No 4). The exposure effect is clear in the Hebron plateau where rainfall increases from under 500 mm (20 in) on the coast to over 700 mm (28 in) on the peak of the plateau. Rainfall on the eastern slopes, on the other hand, decreases sharply due to the rain shadow effect, until it reaches around 100 mm (4 in) in the Jordan Valley near Jericho. The Nablus hills, though lower in altitude, receive about the same rainfall due to the "northern direction effect".

The rainy season is relatively short, with 70 percent of annual precipitation falling between November and February. London and



Jerusalem, for instance, both receive an annual average of around 550 mm (22 in), but the former over 300 days and the latter over 50 days. The number of rainy days ranges from 40 - 50 decreasing west to east and north to south.

Snowfall is often confined to areas of higher elevation in the Ramallah-Hebron plateau. Jerusalem receives on the average two days of snowfall per year, rarely exceeding 25 cm (10 in). On the whole snow is of little significance, whether for its water conservation potential or, conversely, its damage to drops - hail being far more important.

Agriculture production in general is heavily influenced by rainfall considerations. This relationship obviously is far more critical in the case of rainfed farming, the success of which is contingent on such rain attributes as the amount of precipitation during the rain season, pattern of rain distribution, and intensity of rainfall.

There are three parameters of rain which influence farming, namely, average annual rainfall, patterns of distribution within the rainy season, and intensity of rainfall.

In terms of average annual rainfall, the West Bank is relatively humid in comparison with most other countries of the Near East (see Table II-2). On average, two thirds of the West Bank land area receives over 300 mm of rainfall, which is widely considered as the threshold of aridity.

Table (II - 2)

Land classification according to average annual rainfall (percentage)

	Less than 100 mm	100-400 mm	Less than 400 mm	Over400 mm
Iraq	22	67	89	11
Jordan	51	47	98	2
Syria	-	90	90	10
Lebanon	-	10	10	90
West Bank	10	37	47	53
Near East	79	16	95	4

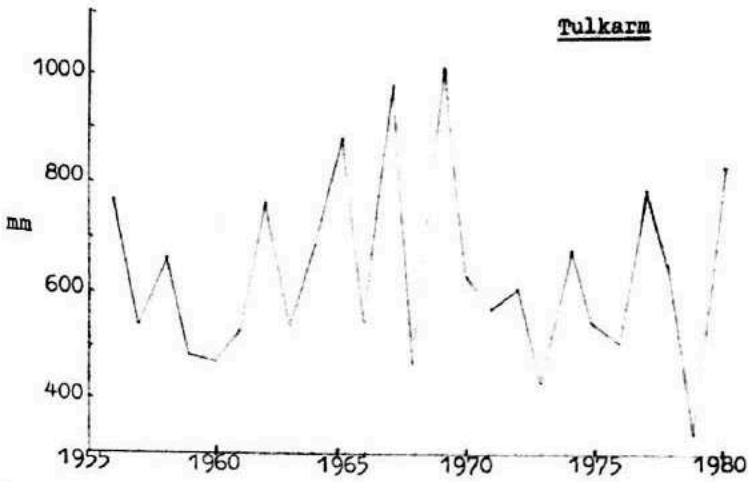
Source: Omar Draz, Rangeland Development in the Arabian Peninsula Based on Syrian Experience, a paper submitted to the FAO Regional Seminar on Rainfed Agriculture in the Near East, Amman 5-10 May 1979, p 3.

There are two main problems associated with the amount of rainfall: length of the rainyseason and seasonal variation in precipitation. The interval of the rainy season, as typical of the Middle East in general, is noticeably short extending mainly from December 20 to February 20, when usually 70 percent of total precipitation falls. By the end of March rain ceases almost totally and leaves the soil and its green cover to a baking sun for more than six months. The practical implications of this climatic constraint on cultural practices under dryfarming patterns cannot be overemphasized.

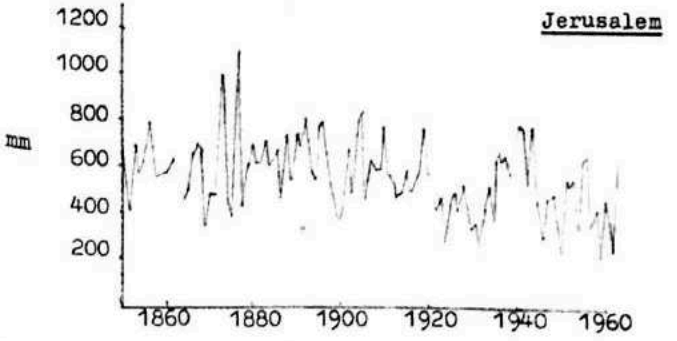
Seasonal variation in the volume of rainfall poses a more serious problem. It is noticeable that there is a very pronounced degree of seasonal fluctuation in the amount of rainfall. This is clearly illustrated in Chart (II-1) which indicates annual precipitation in Jerusalem and Tulkarm over a number of years.

Chart (II - 1)

Fluctuation in annual precipitation



Source: Records of Khadourie Agricultural Institute



Source: P Beaumont et al., The Middle East - a Geographic Study.

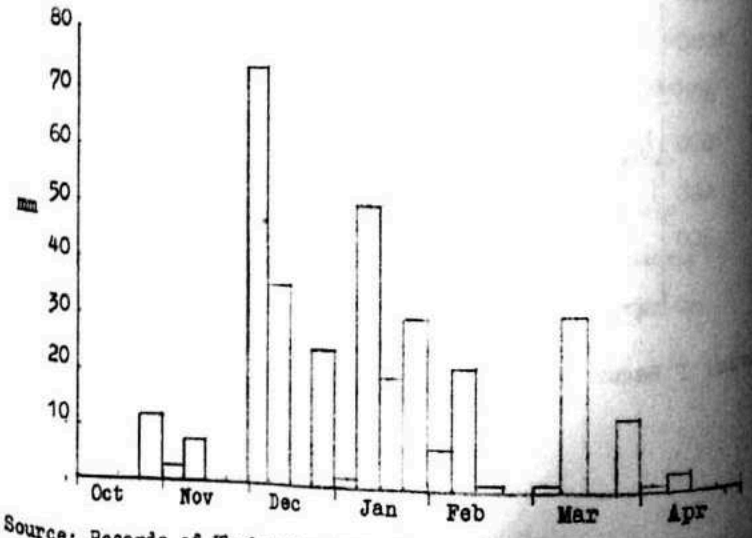
Violent seasonal fluctuations in rainfall entail a large degree of variability in yields of rainfed crops and induce a high margin of risk. This is, in fact, one of the key factors involved in "alternate bearing" of olives, which is a major problem facing West Bank agriculture. Besides, the incidence of drought has a drastic influence on grain crops, natural pastures, and livestock flocks.

Another feature of rainfall distribution is its marked fluctuation within the same season. While the bulk of rain usually falls in mid-season (January and February), there could be considerable irregularity in the pattern of rainfall (see Chart II-2). Again, this adds much to the hazards of rainfed farming, particularly when early rains are sometimes succeeded by prolonged intervals of dryness, which may result in serious losses to crops sown early in the season, following heavy initial showers.

Chart (II-2)

Amount of weekly precipitation (mm)

Tulkarm (1978-79)



Source: Records of Khadourie Agricultural Institute, Tulkarm.

A third detrimental aspect of rain is the intensity of its fall. As typical of semi-equatorial regions, rain may sometimes fall in torrential storms over short periods of time. Table (II-3) shows the incidence of days during the rainy season when more than 30 mm of rain falls in 24 hours. It is not unknown to have rainy days with more than 100 mm of precipitation.

Table (II - 3)

Number of days in which precipitation exceeds 30 mm

(Tulkarm, 1976 - 80)

	30-50 mm	50-100 mm	over 100 mm
1976	1	1	1 (135 mm)
1977	7	2	-
1978	2	-	-
1979	3	2	1 (118 mm)
1980	2	-	-

Source: Records of Khadourie Agricultural Institute, Tulkarm.

The damage inflicted by torrential rain on agriculture is enormous and it adds further to the risks undertaken by farmers on dry land. Besides sweeping trees and crops away, and destroying valuable stone walls, stormy rain also causes considerable erosion of the surface soil which may be only a few inches deep. Erosion is further aggravated by the relatively steep slope of most West Bank hills, which results in putting extensive areas out of production.

Another salient result of occasional torrential rain is the loss of most precipitation in run-off accumulating in ephemeral wadis. Instead of being stored in surface reservoirs, water flows mostly westward into Israel.

The loss of top soil and runoff water through erosion is a grave national hazard which is particularly serious for a country like the West Bank which already suffers a substantial and continuous drain in its land water resources as a result of occupation policies. Undue loss of such resources through natural phenomena is thus all the more regrettable.

Water reserves

The West Bank lies in the path of the rainy winds blowing from the east shores of the Mediterranean. As such it receives a fairly large amount of rainfall averaging at about 700 millimeters on the western foot hills and interior mountains and dropping down to less than 300 millimetres on the eastern slopes (see map 4 on page 48).

Although seasonal variation in the level of rainfall makesit difficult to project a representative volume of precipitation, a British hydrological team projected an estimate based on a two-year average (1964-1965). According to their study,[1] the West Bank received on the average around 2800 million cubic meters (mcm). But two thirds of the falling water is lost later through evaporation and transpiration. The usable reserve is estimated at about 850 mcm.

Springs

There are about 300 known springs in the West Bank, but most of them are of ephemeral and small flow, and onlyafew of them are of value for farming purposes. Springs are generally poorly managed and also suffer deliberate official negligence. In the experience

1. West Bank Hydrology, (London: Rofe and Raffety Consulting Engineers, 1965), p 15.

of the researcher, many of them have been severely damaged and depleted due to the powerful discharging capacity of deep-bore wells drilled by neighbouring settlements. Table (II-4) shows the number of major springs and their annual discharge during 1976-77.

Table (II - 4)

Number of springs and their annual discharge capacity

	No of springs	Annual discharge ($000m^3$)	% of total
Eastern slopes	24	49754	93
Western slopes	32	3572	7
	56	53325	100

Source: Hydrological Yearbook of Israel 1976-77, (Jerusalem: Israel's Water Commission, 1978), compiled from scattered pages.

Artesian wells

The West Bank has got at the present two groups of artesian wells, one owned by Arabs and the other by Israeli settlements. There are 314 Arab wells under actual operation, concentrated mostly in the coastal areas and the Jordan Valley (see Table II-5). Wells in the upper hills are few. This is one reason why these areas have been forced into almost total dependence on rainfall in their agriculture.

Table (II - 5)

Number of artesian wells and quantities of water discharged (1977-78)

Region	No of wells	Quantity discharged (,000 cubic meters)	% of total
Jordan Rift Valley	96	9932.7	26.2
Wadi Fara'a	23	2767.3	7.3
Western slopes	185	20204.8	53.2
Southern hills	10	5033.6	13.3
Total Arab wells	314	37938.4	100.0
Israeli wells (only those in the Valley)	17	14,144.8	

Source: Annual Report on the Monthly Discharge of wells 1977-78, (Beit Eil: Water Department in the Military Headquarters, 1979).

Cisterns

Due to the pronounced seasonal nature of rainfall and its irregular distribution, cisterns have been widely used in Palestine for storing run-off water for later use in the dry months.

A typical cistern is a cone-shaped hole which is about five metres deep and four metres wide (at the bottom). It holds about 80-100 cubic metres of water. Such cisterns have played a critical role in meeting water needs in practically all rural communities in the West Bank. However, their significance has declined over the last two decades due to the dissemination of modern water storage and delivery facilities. Hence, many of them have broken down.

The researcher believes that cisterns could possibly reassume an important role in the context of modernizing rainfed agriculture. Water stored in winter could be used to irrigate newly planted olive seedlings or in the spraying of weedkillers and other chemicals. Thus there may be a good case for reclaiming abandoned reservoirs in areas where certain modern techniques are recommended for developing rainfed agriculture.

Irrigation techniques

Despite the scarcity of available irrigation water, West Bank farmers had until recently practiced primitive irrigation techniques, which were both wasteful and labour intensive. Water was carried in long open earth ditches where it was subject to substantial evaporation and losses in deep infiltration. Some experts estimate the loss incurred in conventional delivery systems to range from one third to one half of the basic supply at the site of origin.[1]

1. Bonet and Blaide, Water Resources and their Exploitation in Judea and Samaria, (Tel Aviv: Mekorot Water Company 1981, p 13).

On the average the quantity of water per irrigated donum of land is about 50% higher than in Israel (112m^3 vs. 70lm^3 per donum)[1]. In addition, water distribution in the field may be too uneven, which ultimately leads to a lower productivity.

Irrigation techniques have rapidly improved over the past ten years. This trend has been stimulated by the high cost of water and labour, and by easy accessability of modern technology through Israeli intermediaries. It has been further accentuated by active financial and technical support provided to farmers by the Mennonite Central Committee. The pace of change has been particularly dramatic in vegetable growing, where drip irrigation pipes and sprinklers are gaining acceptance.[2] This has been accompanied by the rapid expansion in protected farming under nylon sheets. A recent study in the Jordan Valley has demonstrated that profitability of vegetables under drip irrigation and nylon protection is about seven times that of traditional farming.[3] More rapid expansion along this line is impeded by the high volume of investment needed for this purpose, estimated at about JD 100 per donum.

Land Classification

West Bank land is characterized by steep slope gradients and excessive rockiness. Both of these characteristics, as we shall see later in this chapter, impose grave constraints on the prospects for modernizing and intensifying agriculture.

1. Calculated from water consumption data in Table III-5 and on the basis of 80,000 donums of irrigated land in the West Bank, vs 1,980 thousand donums in Israel. (Source: Ststistical Abstract of Israel, 1980, op cit, p 9).

2. According to the Director of Agriculture in the Jordan Valley, 90 percent of vegetables grown in that area is irrigated by modern techniques.

3. Salim Tamari and Rita Giacaman, ZBEIDAT: The Social Impact of Drip Irrigation on a Palestinian Peasant Committee in the Jordan Valley, (West Bank: Birzeit University, 1980), p 25.

Agricultural land is usually divided with respect to its slope into four categories:[1]

1. Gentle to zero slopes 0 - 2%
2. Average slopes 3 - 10%
3. Steep 10 - 15%
4. Very steep over 15%

While the first three categories are considered fit for certain appropriate forms of farming, many reclamation experts would consider land of over 15 percent gradient as not fit for commercial farming.[2] Upon applying these criteria to the West Bank, the situation looks gloomy, since more than 60 percent of its land area has a slope gradient of well over 15 percent. The problem of steep slope is further compounded by the predominance of a large proportion of fixed bed-rock and stones.

Both of the above mentioned attributes, slope and rockiness, were taken as the basis for an aerial photographic survey of West Bank land which was conducted by an Israeli firm shortly after occupation. The results of that survey[3] produced a detailed classification of land area surrounding all West Bank villages. The results of that survey are summarized in Table (I-6), which shows that only 10 percent of land area is fit for irrigated farming, 63 percent fit for dry farming but with various degrees of restrictions, and 27 percent is not fit for cultivation altogether. Although it may be questionable from a Palestinian perspective, this classification is certainly indicative of the magnitude of land development problems which are to be confronted by development planners.

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1. M Wertheimer, Agricultural Land Reclamation Works in Hilly Areas Under a Xerotheric Climate, a paper submitted to the FAO Regional Seminar on Rainfed Agriculture in the Near East, Amman 5 - 10 May 1979, p 4.
2. Ibid, p 4.
3. Classification of West Bank land, an unpublished mimeographed report, Department of Agriculture, 1979, pp 1-6.

Table (II - 6)

Land Classification according to farming capability

Class	Area	Percent	Description
I	172, 292	2.9	Fit for irrigated crops and trees
II	439,774	7.5	Fit for irrigated agriculture with some restrictions
III	1,431,958	24.3	Fit for dry farming and parts of it for irrigation but with major limitations.
IV	2,262,717	38.5	Farming potential is very limited and reclamation processes are unecomonical
V	591,388	10.1	Fit for grazing but not for cultivation
VI	980,734	16.7	Fit for grazing with some restrictions

N.B. The area reported above includes, by mistake, the area of some Arab villages which lie beyond the pre-1967 borders.
Source: Department of Agriculture

The implications of topographic constraints on West Bank agriculture are probably more serious and less manageable than those related to rain. The following is a summary of the problems which have been repeatedly voiced by respondents, and clearly identified by the researcher:

1. Steep slope gradients receiving torrential rains falling after a hot and long summer leads to the twin problems of soil erosion and surface runoff. Both problems have been sharply accelerated since occupation due to the deterioration of stone walls and the non-feasibility of restoring them. The loss of an already shallow top soil requiring hundreds of years to accumulate represents an irrevocable loss and a grave national hazard. In addition to soil loss, it is estimated that 15 to 25 percent of badly needed rain water is also lost as surface-runoff on areas of steep slopes.[1]

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1. Wertheimer, op cit, p 4.

2. Excessive rockiness and high slopes impart profound constraints on the economic feasibility of agriculture on West Bank hills. Reclaiming land of a markedly rough topography requires vast capital outlays (often exceeding JD 100 per donum), which are not only difficult to raise but yield very low financial returns. Even when land is reclaimed, cultivation practices require intensive use of labour and draught animals, both of which are increasingly expensive inputs. This problem is further compounded by the inadequate amount of research aimed at adapting or devising forms of technology which are specifically suited for West Bank topography.

3. A major constraint ensuing from rough topography is the difficulty of constructing workable agricultural roads connecting farms with asphalted highways. This has complicated the process of modernizing production techniques and created a number of important marketing problems. The construction of agricultural roads is stalled by inadequate funding and implicit official opposition.

Given the rigidity of West Bank topographic problems, and considering the vulnerability of "deserted" land to Israeli acquisition, development planners will have to re-orient their priorities in the direction of more extensive exploitation of land resources. This admittedly, is one of the basic premises for the present research.

Land ownership

The average size of a farm holding is an important factor in determining its operational efficiency. The magnitude and direction of this relation, however, is not always clear. While there is

ample evidence to indicate that larger farm size in less developed countries often leads to lower productivity,[1] the converse holds true when the size of holdings gets too small. The definition of optimal size in a country, even as small as the West Bank, requires localized research involving a number of technical, economic and social attributes. In this section we shall only explore the basic features of land ownership and size of holdings.

Land ownership in the West Bank, as well as in most countries of the Middle East, is beset with two conflicting problems, feudal-size ownerships and excessive fragmentation. Averaging on the country as a whole, the size of holding in the West Bank is less than 38 donums.[2] This estimate is too crude, as it conceals wide differences in land quality and extreme variations in size of holdings.

Feudal land ownership had affected Palestine on a scale not much different from the other countries in the region under Ottoman rule for about four centuries. Due to a mixture of factors involving extreme poverty and Ottoman land bribes to favoured leaders and proteges (most of whom were Syrians and Lebanese), land ownership in Palestine developed along pronounced classical feudal patterns. By the turn of the century there were six families in Palestine who owned 23 percent of all cultivated land, while there were 16,910 families who owned only 6 percent of it.[3]

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1. Micheal P Mazur, Economic Growth and Development in Jordan (London: Croom Helm, 1979), p 6.
2. Census of Population 1967, op cit, Publication No 2, p XV.
3. A A'miri, Agricultural and Industrial Development in Palestine 1900-70, (Beirut: PLO Research Centre, 1974), p 53.

After the termination of Ottoman rule and the revived awareness of the political and economic implications of land ownership, the amassing of larger holdings became much more difficult. In contrast, a new trend set in which triggered the splitting of feudal holdings into ever smaller ones. This process was underlied mainly by the continual division of holdings among heirs, and by accelerated purchasing spurred by declining disparity among various income groups. As a result of these and other factors the number of large holdings (e.g. over 1000 donums) dropped sharply from 215 in 1953 to 30 in 1965 (see Table II-7). It is likely that their number has continued to decline since then, though probably at a slower pace.

Table (II-7)

Number of holdings and their distribution by size 1953 and 1965

Size groups (donums)	1953 Number	%	1965 Number	%
Total	61,750	100.0	54,978	100.0
Less than 10	16,816	27.32	27,406	49.84
10 - 49	25,497	41.29	18,932	34.44
50 - 99	9,769	15.82	5,719	10.41
100 - 199	6,193	10.03	2,211	4.02
200 - 499	2,801	4.54	757	1.04
500 - 999	459	0.74	105	0.19
1000 - 1999	117	.19	26	1.05
2000 - 4999	59	0.10	4	0.01
5000 and over	39	0.06	-	-

Sources: 1. Statistical Yearbook, 1957, (Amman: Department of Statistics) p 67.

2. Population and Employment in the Agricultural Sector, 1967 (Amman: Department of Statistics, 1968) Supplement No 1.

Despite a vigorous trend towards the splitting of large holdings into smaller ones, available evidence still points to a pronounced concentration of large areas in the hands of few owners. Table (II-8) shows that while 30 percent of all owners account for 10 percent of owned land, 12 percent of them own 66 percent of the total area in the form of holdings of 50 donums and above. Although this is a clear symptom of inequitable land distribution, the tangible consequences of this problem do not carry a relatively similar weight, since diversity of ownership is most pronounced in land of inferior quality. Unfortunately, the data in Table (II-8) does not make distinctions in land quality. At any rate, it is safe to conclude that land ownership is somehwat inequitably distributed, and the extent of the problem and its actual consequences on the process of agricultural development deserve further study.

Table (II - 8)

Distribution of agricultural land by size of holding

Size of unit (donums)	Total area (donums)	Percent of total area	Percent of total owners	Number of owners
Total	2,091,000	100	100	58,084
1 - 5	24,800	1	16	9,167
5 - 20	195,300	9	23	18,775
20 - 50	499,700	24	30	17,215
50 - 100	579,500	28	4	8,025
100+	791,800	38	8	4,902

Source: Monthly Statistics for the Administrated Territories, No 8, 1971, (Jerusalem: Central Bureau of Statistics, 1971)

The trend towards splitting of holdings into ever smaller sizes seems to have gone much beyond the point of diminishing returns, as could be inferred from Table (II - 9) which indicates a sharp

rise in the number of very small holdings (less than 10 donums). This points to one of the fundamental problems relating to land use, namely excessive fragmentation into ever smaller plots. The primary cause for this phenomenon lies in the verbatim promulgation of Islamic injunctions which call for equitable distribution of inheritance among all heirs. Another factor, though much less important in relation to cultivated land, is occasional parcelling of larger holdings for purposes of land speculation.

The division of nearly all parcels in one holding among eligible heirs has led to extensive dispersion of fragments in the same holding, which are often separated by long distances. Although there is no statistical evidence on the intensity of this problem on the West Bank, but counting on data available for the East Bank where inheritance laws are the same, the problem is certainly severe. For the East Bank as a whole, the overall average number of fragments per holding was estimated in 1975 at 2.3.[1]

The number of holdings showed a decline of 10 percent during the period of 1953-67, and 5 percent in the succeeding interval of 1965-67. The results in Table (II-9) indicate that while there have been slight increases in the number of holdings in Hebron and Nablus, the situation in Jerusalem district recorded a sharp decline. This may be explained in part by massive emigration of local residents from the Jericho area during and after the June War of 1967.

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1. Nazur, op cit, p 154 (calculated from 1975 agricultural census).

Table (II - 9)

Number and distribution of holdings in 1965 and 1967

	1965	1967
Total (including Jerusalem)	55,078	52,064
Hebron	9,815	9,887
Jerusalem (incl. Bethlehem and Jericho)	18,319	14,923
Nablus (incl. Tulkarm and Jenin	26,944	27,254

Source: 1. IDF Census, op cit, Publication No 2, p 18, XII

2. Population and Employment in Agriculture 1967, op cit.

Continuous division of land through inheritance has not only resulted in excessive fragmentation of holdings but also in the dispersion of tiny plots in the same holding over long distances. This has precipitated serious problems and constraints in the process of agricultural development, notably the following:

1. It reduces holdings to sizes which are too small to provide sufficient income for the farm family. This weakens the heirs' incentives to develop their farms and paves the way for many of them to desert their land and change profession.

2. The mechanization of farming operations is rendered increasingly difficult, both for technical and financial reasons.

3. The proliferation in the number of disinterested land owners creates additional problems of communication for auxiliary infrastructures such as agricultural extension, credit, and marketing institutions.

4. The dispersion of plots in a holding over a wide area adds to the difficulty and cost of reaching them and reinforces the lack of interest among owners in attempting commercial patterns of farming.

As will become apparent this research has not led to a concrete conclusion as to the ideal size of farms in a West Bank setting. It is clear that there is such a wide diversity in prevailing farming patterns that detailed farm management studies are needed for this purpose.

Patterns of Land Use

Studies on land use in the West Bank are limited and largely conjectural. A recent study by Tuma and Drabkin presents a crude breakdown of land use which depicts that only 340 square kilometers (km^2) are used for human settlements and non-agricultural purposes, there is 2000 km^2 of agricultural land, 1000 km^2 of unusable land and 2200 km^2 of land reserve which is fit for cultivation and other uses (see Table II-10)

Table (II - 10)

Aggregate forms of land use

	Subtotal (km^2)	Total area (km^2)
Agricultural uses		2000
Human settlement:		
Urban	40	140
Rural	100	
Other uses:		
Roads	70	
Natural preservation	50	
Natural resources	30	
Historical sites	50	200
Unusable		1000
Land reserve		2200
Total		5540

Source: Tuma and Drabkin, op cit, p 58.

Patterns of tenure

According to the Census of 1967, 43 percent of all West Bank households (47% of total population) were found to own farms (see Table II-11). The percentage was highest in Tulkarm and Jenin districts and lowest in Ramallah and Bethlehem.

Table (II - 11)

Percent of households and persons with farms

	Persons		Households	
	% with farms	Total no	% with farms	Total no
Total	47.0	603,392	42.8	119,171
Hebron	48.1	119,317	43.2	22,904
Jerusalem, (incl Ramallah, Jericho and Bethlehem)	41.2	176,909	38.2	36,476
Nablus	46.1	153,429	43.5	29,927
Tulkarm, Jenin	53.8	153,737	47.7	29,864

Source: Population Census, op cit, Publication No 2, p 18.

There is no reliable evidence on developments which may have taken place in patterns of tenure following occupation. Data of the 1965 census indicate that more than two thirds of all holdings are owned by operators, and only 10% are cultivated by tenants. (see Table II-12)

Table (II - 12)

Patterns of land tenure (1965)

District	Totally owned	Rented or share-cropped	Partly rented & partly owend	Total
Total	1,350,918	165,292	368,703	1,884,913
Distribution (%):				
Hebron	80.9	7.1	12.0	100.0
Jerusalem	82.1	5.5	12.4	100.0
Nablus	67.8	9.7	22.5	100.0
Jenin	51.4	14.4	33.8	100.0

Source: Agricultural Census, 1965, (Amman: Department of Statistics) Supplement No 2 and 3. Quoted from Jamil Hilal, p 158.

It should be emphasized, however, that tenancy is much more important than that indicated by the above mentioned data. During the course of his interviews with farmers and concerned officials, the researcher discovered that more than half the number of holdings under intensive cultivation in Tulkarm, Jenin, and Jericho districts are cultivated by tenants - mostly on a cash rent basis. Besides, a certain form of tenancy is very common in olive production where owners delegate picking of the crop to "tenants" against a given share in the yield of fruits - currently at a round one third of it.

Despite having no law governing tenancy, West Bank agriculture does not suffer from serious inefficiencies as a result of tenure problems, in contrast to agriculture in most less developed countries. Disputes between land owners and tenants are rare, and in the vast majority of cases the leases are renewed automatically. In fact, it could be assumed that tenancy has even helped to improve productivity in areas of intensive agriculture by handing over scarce land and water resources to professional farmers who have acquired considerable expertise over recent years.

Disputes among owners, however, are fairly common, mainly due to conflicts arising between heirs, or ambiguity of titles in areas which have not been surveyed by the cadastral office. Disputes of this sort can be characterized by such ferocity that they may even eventually result in bloody feuds! Land ownership, evidently, is characterized by a profound emotional attachment which almost over-rides all other sentiments.

Communications

The West Bank towns are connected by a reasonably good main road system which was laid down during the early days of the British

Mandate. During the Jordanian rule, very few additions or improvements were introduced, partly because of serious topographic difficulties, but mostly as a result of official discrimination in favour of the East Bank. By June 1967 the West Bank had only around 500 kilometres of main road (0.09 km per one square kilometre of land area), and not one road had more than two lanes (see Map No 5).

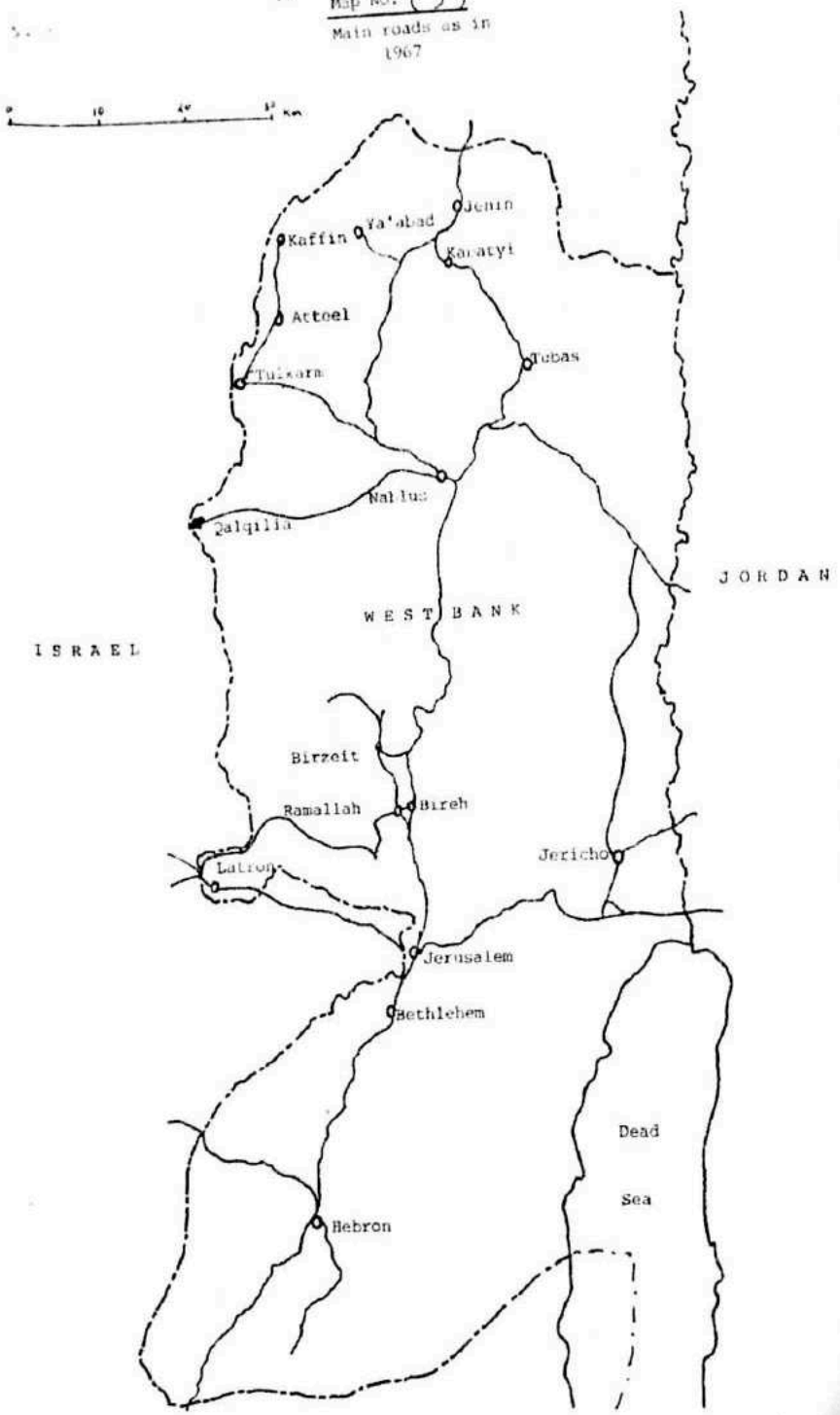
But the most striking weakness in the road network lay in rural areas. Although roads connecting villages with neighbouring towns were reasonably passable, very few asphalted roads were constructed between villages and surrounding farm areas. This resulted in very serious problems in regard to handling of produce, especially of such perishable products as grapes and tomato.

During Israeli occupation major additions in the road system were introduced. Many long roads of good quality were opened in the early days of occupation for the purpose of security, and later many more were constructed for serving Israeli settlements. Unfortunately, it is not possible to lay down on a map all roads built by Israel, because no adequate information is available.

In spite of their length and good quality, Israeli West Bank roads serve very limited purposes for local citizens, and especially agricultural production purposes. This is due mainly to their remote location, and sometimes to restrictions imposed by settlers.[1] Furthermore, the Military Administration has displayed a restrictive and

1. A prominent example is the lateral road connecting the Allon road with the Nablus-Ramallah highway and passing by the Shillo settlement. All the land used by the settlement and the road belong to the residents of Sinjel, whose Arab residents are prevented from making use of the new road except when going on foot.

Map No. (5)
Main roads as in 1967



cool attitude towards all efforts to develop the road system in rural areas presumably for fear of expediting urban expansion or more vigorous land uses.

Transportation by air has also been severely curtailed since occupation. Jerusalem Airport was "confiscated" and passengers had to go through Ben Gurion or Amman airports. Nevertheless, air cargo has never been an important vehicle for West Bank farm produce.

Being land-locked, the West Bank has no direct access to a sea port. Prior to occupation businessmen and farmers had to rely heavily on the ports of Aqaba and Beirut, both around 400 kilometres away. Although Haifa (in Israel) is much nearer, it is not used extensively in agricultural trade because the bulk of exports are destined for shipment by trucks to Jordan and the Gulf states. At the present, therefore, the lack of port facilities is not an important handicap for agricultural development.

Telecommunications pose important problems for West Bank businessmen and farmers. The telephone service is still primitive and extremely time wasting in most regions, especially in northern districts. Telex services outside Jerusalem are not available due to restrictions imposed by the Military Administration. Lack of direct communication channels with Jordan and Arab countries cause serious difficulties to exporters. Improvements in telecommunications are very slow due to severe constraints imposed by both Israel and Arab countries for a variety of political reasons.

Demography

The West Bank population is primarily that part of the Palestinian Arabs who have continued to dwell in their homeland following the establishment of the State of Israel. Ethnically, they are fairly homogeneous, originating from Semitic Arab tribes, mostly from northern Arabia. In this section we will try to assess changes in population growth, ascertain basic demographic characteristics, and evaluate their impact on economic development and technological change.

Population growth

The West Bank population has undergone dramatic changes since it was first disrupted in 1948. Table (II-13) presents a summary of those changes as assessed from several sources.

Table (II - 13)

Major shifts in the size of West Bank population

1948	Prior to War	475,400[1]
1948	Post War	750,000[1]
1952	Two years after annexation to Jordan	742,000[2]
1961	First population census	805,450[3]
1967	Prior to the June War	843,000[1]
1967	Post occupation (IDF Census)	664,494[4]
1980	End of year	820,600[5]*

Sources:

1. Jamil Hilal, op cit, p 18, 81.
2. Housing Census of 1952, (Amman: Department of Statistics, (1953) Table No 1.
3. First Population Census of Jordan, 1961, (Amman: Department of Statistics, 1962).
4. Census of Population 1967, (op cit, Vol 1, p X. This figure includes the population of East Jerusalem estimated at 65,857.
5. Administered Territories Statistics Quarterly, Vol XI, No 1, 1981, op cit, p 1. Includes 117,000 for East Jerusalem.

* The real size of the West Bank population might be well higher than the figures quoted by the Central Bureau of Statistics. A recent article in Davar (March 20, 1980) quotes a secret report by the Ministry of Interior which estimates the population in the West Bank and Gaza Strip at 300,000 higher than CBS estimates.

The original size of the West Bank indigenous population before the 1948 war is estimated at 475,400, which amounted to 36 percent of total Arab population in Palestine (1.33 million). But considerable changes took place during the course of the war which broke out following the termination of the British Mandate on June 15, 1948. A major objective of the invading Israeli forces was the seizure of the maximum land area while trying every possible means to evacuate their local Arab residents. By the end of the military hostilities in 1949, around 625,000 Palestinians were refugees[1], amounting to 47% of all Arabs in Palestine. Only 156,000 (around 12% of Palestine's Arabs) continued to stay in the newly established State of Israel.

The exodus of Palestinian refugees caused major shifts in the size of population in the remaining West Bank and the Hashemite Kingdom of Jordan. In less than two years the West Bank population increased by 65% and that of Jordan by 29%.

Population shifts continued at a marked pace during the fifties and the sixties and they were primarily motivated by depressed economic activity and a low standard of living. This resulted in a vigorous wave of emigration of the emerging Gulf states which were in great need of the skilled Palestinian labour force. Furthermore, many West Bankers opted to migrate to the East Bank in response to what was considered to be the biased economic policy of Jordan.

As a result of several push and pull factors, emigration proceeded at a pronounced pace all through the Jordanian rule and it included residents from all strata, refugees and non-refugees, urban and

rural dwellers, Christians and Moslems. On the eve of occupation in June 1967, the West Bank population was estimated at 843,000, about 200,000 less than the figures projected by the relevant natural rate of increase. In contrast, Palestinians in the East Bank increased rapidly until they reached 40 percent of the total population in 1961 and 58 percent in 1972.

The June War witnessed a repetition of the intricate evacuation tactics which were successfully tested in 1948. During the few days of actual combat and in the few subsequent weeks, about 178,000 people left their homes seeking shelter in the East Bank.[2] In September 1967 the population of the West Bank was ascertained in a general census conducted by the Israel Army and the Central Bureau of Statistics and was reported at 664,494 (see reference in Table II-13).

Population growth during Israeli occupation proceeded at erratic and very low rates (see Table II-14). The scale of population drain could be properly perceived in view of the unusually high rate of live births in the country, which averaged during the seventies at around 4.5 percent and a rather modest mortality rate of about 1.5 percent. By the end of 1980 the West Bank population (including East Jerusalem) amounted to 820,600 which is 88,000 less than the population projected at the modest annual net increase of 2.5 percent. This indicates that emigration during the period 1968 - 79 exceeded 10 percent of the projected West Bank population for 1980.

Table (II - 14)

Population increase 1968 - 78

	Population at end of year (,000)	Annual increase (%)
1968	581.7	
		0.7
1970	603.9	
		1.5
1972	629.0	
		1.9
1974	661.6	
		2.4
1976	670.9	
		0.9
1978	690.4	
		1.4
1979	699.6	
		1.3

Source: Statistical Abstract of Israel No 30, 1979, p 717. Above figures exclude East Jerusalem, whose population by the end of 1979 is estimated at 106,000.

Census of Population 1967 (Jerusalem: Central Bureau of Statistics) Publication No (1), p IX. The figures reported above do not include those of East Jerusalem.

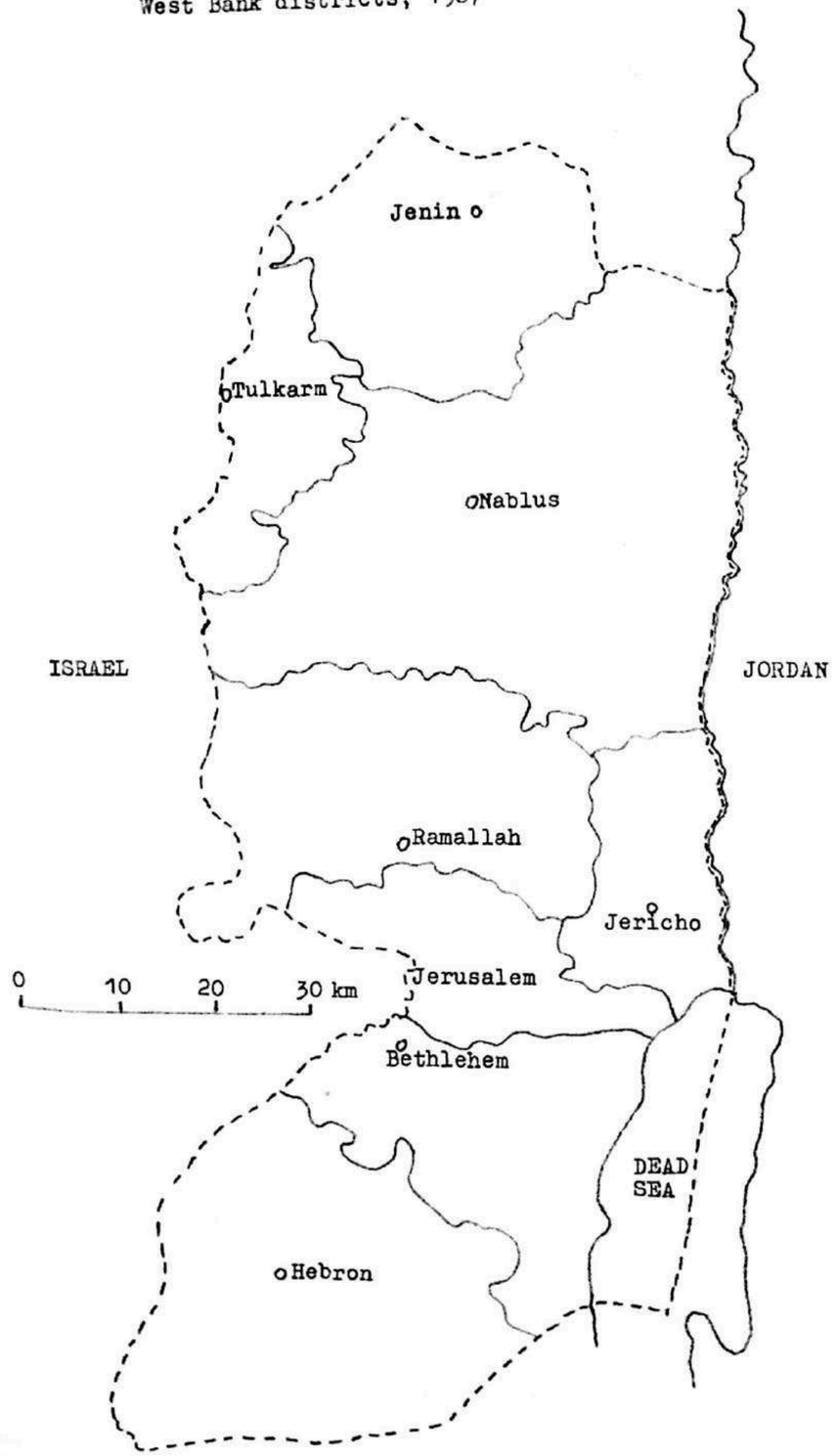
The basic motives for emigration were again economic, particularly after 1972 when Israel moved into economic recession and steadily rising inflation rates. Furthermore, the official policy was being particularly effective in driving out educated young people who were not attracted by the only open employment opportunity, manual labour in Israel. Consequently, graduates found themselves obliged to emigrate in pursuit of employment in the expanding economies of Jordan and the Gulf States.

Geographic distribution of population

The West Bank population is distributed among seven districts. The boundaries of these districts have been noticeably altered by Israel following occupation, in response to various security and political motives. (See Map No 6 for 1967 boundaries of various districts). Table (II-15) shows distribution of population (by district) and area of districts as revealed in the IDF census of 1967. By then, Hebron district had the largest

Map No (6)

West Bank districts, 1967



population, while Nablus had the largest area and Tulkarm was of the highest population density.

Table (II - 15)

Population, area, and population by district

(September 1967)

District	Population		Area (km^2)	Density (per km)
	Number	Percentage		
Total	805.6	100.0	5,572.0	144.6
Jenin	107.7	13.4	571.7	188.3
Tulkarm	121.0	15.0	332.0	363.4
Nablus	128.0	15.8	1,587.4	80.6
Ramallah	114.0	14.2	770.3	148.0
Jericho	11.3	1.4	338.1	33.4
Jerusalem	106.0	13.2	351.1	301.9
Bethlehem	77.0	9.5	565.2	136.2
Hebron	140.6	17.5	1,056.2	133.1

Source: IDF Census, op cit, p IX.

Considering the scarcity of cultivable land (around 200,000 hectares) and irrigation water (less than 90 million cubic meters per year) the population density in the West Bank is quite high. This adds an important constraint to the potential role of agriculture in economic development and dictates policies which are sensitive to peculiar socio-political needs, sometimes, as we shall see later, at the expense of purely economic criteria.

Types of settlement

In terms of size of settlement, the West Bank population is predominantly rural, since 70 percent of it inhabit villages of

less than 10,000 each and only 30 percent live in urban settlements, (see Table II-16). Refugees in camps constitute 8.5 percent of total population and 32 percent of them are classified as urban because of their proximity to major towns. Nomads and other settlers amount to 1.2 percent of the overall population.

Table (II - 16)

Population by type of settlement*

	West Bank	East Jerusalem	Total	Percentage
Total	598,637	65,857	664,494	100.0
Urban settlement-total	155,235	44,369	199,604	30.1
Refugee camps-urban	19,217	-	19,217	2.9
Refugee camps-nonurban	37,221	-	37,221	5.6
Large villages	41,697	5,701	47,398	7.1
Small villages	337,531	15,787	353,318	53.1
Nomads	1,888	-	1,888	.3
Living outside settlements	5,848	-	5,848	0.9

* Settlements were classified urban if numbered 10,000 or more, large villages if numbered 5,000 - 10,000, and small villages if containing 50 - 5000 inhabitants.

Source: IDF West Bank Census, op cit, p X.
IDF East Jerusalem Census, op cit, p XII.

The excessively small size of settlements is illustrated in Table (II - 17) which shows that in the fall of 1967 there were only ten large villages of 5000 - 10,000 inhabitants and only three of them had a population exceeding 15,000, namely, Jerusalem (44,000), Nablus (41,800), and Hebron (38,300). Sizes of towns will have changed since 1967 but probably not noticeably so due to the modest increase in population figures. No estimates of population in individual settlements have been made since the IDF Census of September 1967.

Table (II - 17)

Number and types of settlements, by district

		Villages		
	Towns	Large	Small	Refugee camps
Jenin	-	2	53	1
Tulkarm	-	1	41	2
Nablus	1	1	95	6
Ramallah	1	1	70	2
Jerusalem	1	-	36	2
Jericho	-	1	3	4
Bethlehem	1	2	25	2
Hebron	1	2	65	2
Total	5	10	388	21

Source: IDF Census, op cit, pp 60-117

The unusually large number of nuclear rural communities in the West Bank entails important guidelines relevant to socio-economic development. While it points to the crucial significance of mobilizing abundant rural human resources, it illustrates on the other hand the need for efforts to be expanded in disseminating public utilities and basic infrastructures over a large number of scattered communities. The urgency of this effort stems from the rapid mobility and migration of village dwellers to urban communities in search for better standards of living - a process which has been enhanced by the thrust of rural communities towards college education. Evidently, the migration of the educated rural elite has precipitated serious demographic and economic constraints on the patterns and pace of rural development. Among the most important objectives set forth in this study is the curtailment of

rural migration through the adoption of programs which improve rural standards of living, while simultaneously expanding exploitation of abundant resources.

Sex and age distribution

West Bank population is characterized by a markedly young age composition and the preponderance of women in the age groups ranging from 25 - 50 years of age. Table (II-18) shows that 45.1% of population is below fourteen years, as compared with

Table (II - 18)

Population by sex and age (in percentages)

December 31, 1979

	West Bank			Israeli Jews		
Age group	Females	Males	Total	Females	Males	Totals
Total	100.0	100.0	100.0	100.0	100.0	100.0
0-14	42.8	47.3	45.1	29.5	31.4	30.4
15-29	27.8	29.8	28.8	25.3	26.3	25.8
30-44	13.7	9.8	11.7	17.2	17.0	17.1
45-64	11.8	9.2	10.5	17.9	16.2	17.0
65+	3.9	3.9	3.9	10.1	9.1	9.7

Source: Statistical Abstract of Israel, 1980, op cit, pp 54, 678.

only 30.4% for Israel's Jews. Whereas the percentage of the population in the productive age groups ranging from 30 - 64 years drops considerably below that of Israeli Jews (22.2% vs. 34.1%), which is a clear indication of the high rate of emigration by males of this age in pursuit of employment abroad. Another important cause of the young composition of population is the very high rate of births in the West Bank, estimated at 44.9 per thousand, vs. 22.0 for Israeli Jews.[1]

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1. Statistical Abstract of Israel, 1980, op cit, p 4, 679.

The distribution of population by sex reveals a clear feminine majority in the age group of 30 - 44, which is another reflection of the massive exodus of West Bank males in search of employment.

The excessively young nature of the population and the femininity of the working age group entail significant socio-economic consequences which are of direct relevance in agricultural development in the West Bank. Although available figures do not reflect differences in those attributes relative to types of settlement, it is generally felt that the severity of the youth feature and the predominance of females is particularly acute in rural areas due to a much more vigorous emigration, whether for employment or education. The dynamics of the rural labour market will be explored further in a later section.

Education

Palestinians are well-known in the area for their high standards of education. This is clearly designated in such criteria as relatively low illiteracy (e.g. West Bank 26 percent, 54 in Iraq and 37 percent in Syria) and high ratio of population enrolled in schools at various levels (about 37 percent of population).[1] But the picture is most noticeable in the case of college education. According to UNESCO reports, the ratio of college students to the total West Bank population is among the highest in the world, supposedly ranking only second to that of the United States (3000 and 3471 students, respectively, per 100,000 of population).[2]

1. Computed from Administered Territories Statistics Quarterly 1980, op cit, p 155.

2. Corresponding ratios for some other countries: Egypt 565, Pakestan 278, France 1239, Israel 1488.
Source: UNESCO, 1968-69. Quoted from Sami Mar'i, Higher Education of the Palestinians - with Special Reference to the West Bank, published in the Palestinians and the Middle East Conflict (Israel: Turtledove Publishing, 1977) p 436.

Pre-college education is handled by UNRWA and private institutions - mostly of a religious affiliation. Elementary education through the sixth grade is compulsory for boys and girls.

High school education is characterized by the dominance of purely academic subjects. Less than 10 percent of all pupils in the secondary cycle are enrolled in vocational schools.[1] The rest are enrolled in "literary" or "scientific" streams of study whereby they are basically prepared to pursue higher education after they pass their Tawjihiyah* national examination. High marks in the Tawjihiyah are looked upon with tremendous desire and respect because they help facilitate admission to prestigious lines of college education, namely, medicine and engineering. Of 8845 pupils who had successfully passed their Tawjihiyah in 1979[2], 4530 of them scored over 70 percent, which theoretically qualifies them for university education, that is if they manage to secure admission somewhere.

College education is accessible in institutions inside and outside the country. A large proportion of high school students is absorbed in local universities and higher institutes of education. In 1981 there were three accredited universities: Birzeit, An-Najah and Bethlehem. There were also six teacher training institutes, one polytechnic, three junior colleges, and a para-medical college. The total absorption capacity of all these institutes is in the range of 2500 - 3000 students. This is considerably smaller than the number of pupils who pass their Tawjihiyah every year, usually

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1. Computed from Administered Territories Statistics Quarterly 1980, op cit, p 155.

2. Ibid, p 155.

* The common name of the certificate awarded at the successful completion of secondary education.

over eight thousand. Consequently, a large number of students is still obliged to seek higher education abroad.

The situation of higher education in the West Bank is a source of some paradox. Notwithstanding its attractive aspects, the role of higher education in developing the West Bank itself and accentuating the commitment of the Palestinians to their land is certainly unsatisfactory. Against a background of limited investment opportunities and discriminatory economic policies during the past fifty years, college education of West Bank youth has become a pre-requisite for their subsequent emigration to other countries where their services are in demand.

This problem has been effectively facilitated by the quality of higher education pursued by West Bank students. Due to a number of complex factors the largest proportion of them go into social sciences and literary subjects. This has entailed very serious consequences on the recruitment potential for such sectors as agriculture, handicraft industries, and service professions, which are left largely with school dropouts and pupils who could not, for various reasons, make their way to any form of college education. Consequently, the nation with one of the highest rates of college education in the world has had no more skilled man-power in its productive economic sectors than an average under-developed country. This is a striking indication of an educational system which is specialized in meeting the needs of other countries for educated man-power, with a disregard for its own needs. And unless a quantitative and qualitative re-orientation in the West Bank's educational system is envisaged along criteria which are more sensitive to local economic and political needs, then the very presence of the Palestinians on their land may be at stake.

Religion

West Bankers are of two major religions, Islam and Christianity. According to the 1967 Census, Moslems constituted a majority of 93.3%, while Christians amounted to 6.1%.[1] Christians are mostly concentrated in urban centres, mainly in Ramallah, Bethlehem, and Jerusalem. There are, however, several villages where Christians constitute a majority of population. Prominent examples are Beit Sahour, Beit Jala (Bethlehem District), Birzeit, Jifna, Taibe, Aboud (Ramallah District), and Zababdeh (Jenin District). In total the Christian rural population hardly exceeds 30,000, which is less than 7 percent of the total rural population in the West Bank.

Religious and social constraints to agricultural development

The process of agricultural development in the West Bank bears heavily on a wide range of religious, social, and demographic factors. Some of these values may facilitate development, whereas others may be indifferent or hostile to it. In this section we shall evaluate the interaction of two social structures on economic and agricultural development; the role of the Islamic faith in development motivation and the attitudes of local communities to manual professions. In later sections we shall discuss the role of women in agricultural labour and the impact of demographic attributes on the dynamics of the labour market.

Islam and development motivation

The role of religion in the development process in underdeveloped countries is complex and controversial. Empirical evidence, for instance, shows that poverty and underdevelopment are pronounced

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1. IDF Census of 1967 for West Bank (p XII) and East Jerusalem (p XIII).

in Latin America, Asia, and the Middle East, where adherence to religions is strong. This is in sharp contrast with the high rates of development and affluence in European and American countries, which have a lesser role for the churches.

Obviously the interaction between religion and development, whether in poor or rich countries is too complex to permit any easy conclusions. This is an area where there is room for further research, particularly in Moslem countries. For our purposes, however, it is fitting to examine briefly the impact of religious affilitation on development efforts in the West Bank, especially in rural areas.

Western economists and thinkers do not hesitate to refer much of the economic and social ailments of Moslem countries to their religious beliefs. Most of them would subscribe to Vivian Bull's assessment that "Islamic tradition appears to offer little to support the necessary preconditions for development."[1] Truly enough, the casual reader of the Koran will find plenty of connotations which degrade material well-being and conceive of worldly life as merely an interim test period for the human being. Believers who pass the test are rewarded with an eternal life in "paradise", and those who do not are to be punished in "hell".

While it is true that Koranic injunctions place excessive emphasis on observance of patterns of behaviour which would qualify the "good" Moslem for his other life, it is equally true that Islam has utterly forbidden its followers to devote their lives to practising religious rituals. This message is clear in many

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1. Vivian Bull, op cit, p 32.

Koranic injunctions which call on Moslems to "conduct thy spiritual rituals but not forget your share in this life." Mohammad is reported in the "Hadeeth" to have said "live your second life as if you are dying tomorrow, and your first as if you are immortal."

Islam has in fact banned priesthood as a profession or way of life, demanding of all Moslems to work for their living while simultaneously attending to their rituals. Islamic economic guidelines leave ample room for private ownership and initiatives within few constraints, most importantly, a ban on cheating, stealing, monopoly of necessities, and usury. Unconditional accumulation of wealth through legitimate means is respected as long as income earners pay their "zakat" income tax.

Empirical evaluation of the impact of Islamic faith on economic life in the West Bank (and in most other Moslem countries) lends no evidence to a negative correlation. Farmers, shop-keepers, artisans and small businessmen are noted for their enterprising spirit and hard work, while at the same time most of them may be overly pious. Commonly, they make their pilgrimage to Mecca and observe their prayers regularly while attending to their work. Farmers and rural residents tend to be noticeably closer to religious practices, while at the same time they are the harder workers. In fact the close observer can detect a sense of missionary fanticism in their attitudes toward farming. This could be illustrated in the famous proverb rationalizing growing olive seedlings, which says "they(forefathers) planted and we eat, we plant and they eat (coming generations)". Again the Prophet is said to have kissed the hands of a farmer and noted that "those hands will not be touched by fire in the Doomsday."

Contrary to theoretical arguments, the secularization of Moslem

communities through higher education and acculturation along Western prototypes may have in fact drastically undermined the unusually dedicated spirit to farming and manual professions. This will be discussed in the next section, but it is safe to conclude this section by emphasizing that Islamic beliefs and practices do not constitute a deterrent to development, particularly in agriculture.

Attitudes to manual professions

A common feature of Middle Eastern societies is their marked bias for white-collar jobs such as medicine, engineering, law, teaching, and the government service. Professional occupations requiring manual skills are rarely taken out of choice, but more often due to failure to get a "cleaner" job. Undoubtedly, this attitude has deterred faster economic development, to the extent that it has impeded the mobilization of competent manpower to production sectors such as farming, industry, and handicrafts. Hence these sectors are frequently left mostly with mediocre workers.

Contrary to arguments presented by some writers, this attitude towards manual professions has little bearing on Islamic teachings. Instead, it seems to have its roots in the nature of Turkish, British, and Jordanian rule of the West Bank, when tangible experience demonstrated starkly the superior social and material remuneration which was accessible through certain types of professions. Thus, the popular preference for such jobs seems to have been a totally rational decision on the part of youth mindful of their future careers. Their priorities, naturally, bear directly on the quality of education which they would like to pursue - should they become free to do so.

The situation in the West Bank, in regard to prevailing attitudes towards manual professions has changed slowly following occupation. Again, the change has been the result of considerable restructuring in the jobs market in favour of manual professions. This trend may be healthy and desirable, but it should go at a much faster pace if economic development in the West Bank is to proceed at the rates envisaged in this study. The ramifications of this transformation in the system of education were discussed under the section on Education.

Labour

Transformations in the labour market following occupation are so profound and comprehensive that they require a number of studies dealing with their economic, social and political ramifications. This, of course, is much beyond the scope of this study. In this section, however, we will describe the basic features of the labour market and provide an assessment of their impact on the process of agricultural development.

Size of labour force

The West Bank population in 1979 averaged at 689.6 thousands, of which 384.4 were of working age (55%). The size of the labour force, on the other hand, was estimated at 134.1 thousands,[1] which points to a markedly low participation rate of 19.2 percent, as compared with 33.3% in Israel,[2] 25% in Syria, 29% in Iraq,[3] 47% in Britain and 51% in Japan.[4]

1. Statistical Abstract of Israel 1980, op cit, p 690.
2. Ibid, pp 3-5, note that this percentage includes only civilian manpower.
3. Available Demographic Socio-Economic Date for Countries of ECWA Region, (Beirut: Economic Commission for Western Asia, 1976).
4. Kamel Abu Jaber, et al, Conditions of Working Women in Jordan, a paper submitted to the Seminar on Population, Employment, and Development - Amman, 1971.

The relatively low participation of West Bank population in active labour reflects several inherent constraints, most important of which are the following:

1. Preponderance of children in the non-working age group (14 years and below) who make up around 45% of all the population, as compared with 30% for Israel's Jews.

2. High enrolment rate in schools, estimated at around 37%. The situation is particularly dramatic in the case of higher education which, as we shall see later, absorbs a substantial portion of the population in the age group of 18-30 years.

3. Female labour is grossly under-estimated, mainly due to inadequate coverage of their participation in farming operations.

4. Massive and sustained emigration of a large number of workers, largely men, estimated at about 15-22 thousand a year.[1]

Sectoral distribution of labour

Table (II-19) shows pre and post occupation trends in regard to the size of labour force, employment ratios and sectoral distribution of employed workers.

1. Estimates of the Executive Office for the Affairs of the Occupied Territories, quoted in "Resources of the West Bank - Their Significance to Israel", op cit, p 35.

Table (II - 19)

Trends in employment and sectoral distribution of the labour force

	1969	1979
Total labour force*	108.3	134.1
- Number of employed persons (in the West Bank and Israel)	103.9	132.8
- Percent employed	95.9	99.0
Sectoral distribution (%)**		
- Agriculture	47.8	31.5
- Industry	15.2	15.9
- Construction	12.0	11.8
- Services	25.0	40.8

* Includes hired and self-employed workers.

** Of workers employed in the West Bank.

Source: Statistical Abstract of Israel 1980, pp 690 and 696, and 1970 Abstract, p 633.

The results shown above reveal important shifts in the size of the labour force, level of employment and vocational division of employed workers. It is clear that there has been only a slight increase in the number of workers employed in agriculture and construction, which was caused mainly be a sharp contraction in both sectors. Many of the surplus workers were absorbed in service sectors on the West Bank itself, and the rest have either sought work in Israel or abroad.

Despite a natural population increase of over 3%, the size of the labour force has increased in ten years by only 23.8%, i.e. just about 2% a year. Again, this is further quantitative evidence on the acute problem of labour emigration to neighbouring countries.

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1. Administered Territories Statistics Quarterly Vol X No 1-2, op cit, p 128.

The question of unemployment is much more complex than is revealed in Table (II-19). While it is true that unemployment has practically disappeared in recent years, there are annual waves of college graduates, estimated at about 3000 a year, of whom only about 10% succeed in getting employed. The vast majority of them are forced to seek employment abroad, and hence miss being recorded among the unemployed. So the situation of employment is now structured in a way which is specifically favourable for the unskilled and semiskilled blue-collar workers. Workers in these categories appear to find no problem in getting absorbed in West Bank or Israeli labour markets whereas college graduates and skilled technocrats stand little chance of being employed at home (and of course not in Israel); hence they are forced to leave.

Female labour

Women constitute 52 percent of the working-age population, yet their participation rate, as reported in official statistics is very low and rarely exceeds 10% of women in the working age, as compared with 60% for men.[1] Taken at face value, women's participation in the labour market compares well with most LDC countries (e.g. 3.51% in Jordan 5% in Kuwait, 6% in Syria) but much less so with more developed countries (30% in the US, 33% in Britain, 44% in the USSR)[2] On the other hand, women's share of the employed labour force, as reported in official statistics, is estimated at 18%[3], compared with 16% in Jordan[4] and 36% in Israel.[5]

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1. Administered Territories Statistics Quarterly Vol X No 1-2, op cit, p 128.
2. Kamel Abu Jaber, op cit, p 2.
3. Statistical Abstract of Israel 1980, op cit, p 690.
4. Yousef A Haq, Economic Planning and Development in Jordan, a PhD thesis - Ein Shams University, Egypt, 1979, p 132.
5. Statistical Abstract of Israel 1980, op cit, p 5.

Women's share in agricultural labour, though difficult to quantify, is much more important than is indicated in official data. Technicians and officials who were interviewed in the course of this study have estimated women's share in the aggregate labour supply which is mobilized in agriculture at about 75%, as compared with only 20% in Jordan and 3.9% in Israel.[1] A similar proportion as that reported above was calculated from the responses of farmers who were sampled in this study. Furthermore, it was indicated by both groups (technicians and farmers) that about two thirds of female labour input is contributed by members of farm families on a seasonal basis. This explains the difficulty of accounting for female labour in official data.

Employment in Agriculture

Employment in agriculture has declined steadily and substantially during the occupation era. Counting on the basis of several conjectural estimates, it is believed that shortly before occupation, agriculture employed some 37-40% of West Bank labour. Admittedly, there was a slow but steady drop in agricultural labour since the 1961 Census which then estimated agricultural employment in Jordan at 40%,[2] and it could have been higher for the West Bank alone.

The situation of agricultural employment started to change rapidly as of 1969 when West Bank labourers were permitted to seek employment inside Israel. The number of agricultural labourers (excluding those working in Israel's agriculture) reportedly declined by 41% during the period of 1969-79 (see Table II-20)

1. Statistical Abstract of Israel 1980, op cit, p 316.

2. Lower estimates reported in the IDF Census of 1967 are due to the exclusion of the large number of labourers who emigrated during the War and shortly after. For many reasons, emigration from rural areas was more pronounced.

Put differently, the percentage of workers employed in agriculture relative to total employed labourers has dropped from 49 to 29.1 percent.

Table (II - 20)

Secular trends in agricultural employment

	Total employed	Employed in agriculture*	
Year	(000)	Number (000)	Percent of all employed
1969	109.9	49.0	44.6
1971	116.8	36.7	31.7
1973	126.4	30.0	23.8
1975	132.3	31.8	24.0
1977	127.4	30.7	24.1
1979	132.8	29.1	21.9

* This includes only those employed in West Bank agriculture. The number of workers and their percentage were computed from data provided in the original reference.

Sources: Statistical Abstract of Israel 1980, p 696 and 1970, p 633.

Labour mobility out of agriculture is underlied by a number of dynamic factors which were set in motion by the advent of occupation. This not only curtailed the number of hired workers in agriculture but it also forced out of it an increasing number of peasant farmers. According to official data, the number of farmers leaving agriculture during 1970-74 was more than four times larger than the decline in hired labourers.[1]

The crux of the problem lies in the sharply declining profitability of most patterns of farming, which in turn is attributed to complex variations that have boosted production costs without inducing

1. Computed from Table G, in West Bank Agriculture 1973, (Ramallah Directorate of Research and Extension, publication no 147), p 9.

comparable rises in the prices of farm products.[1] The impact of declining profitability is especially pronounced in rainfed agriculture due to its intensive use of labour and the higher risks ensuing from excessive dependence on climatic factors.

The push-effect induced by reduced income from farming has been further accentuated by a soaring consumer price index and rising standards of living in rural communities. This has forced thousands of farmers to leave and choose the apparently more lucrative option of becoming hired labourers - largely in Israel.[2]

It is hard to ascertain with reasonable precision the influence of accelerated mechanization on the labour-absorptive capacity of West Bank agriculture. This is a field where much more work is needed. Tentatively the researcher believes that mechanization has not saved much on labour requirements, because of the extremely limited potential for modern labour saving machinery in the context of West Bank topography.

The repercussions of declining employment in agriculture are very grave, both economically and politically. Very briefly this process accelerated the desertion of land and its eventual transfer to Israeli control, undermined the productive potential of a major economic sector, and transformed a large segment of deeply rooted Palestinians into roaming "mercenaries". An important objective of this study is to seek ways which would help stop this drain, and possibly reverse it.

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1. This issue will be scrutinized at length in the chapters on economics of production.

2. During 1970-73 the number of owner-operators has declined from 33,800 to 26,000. (West Bank Agriculture 1973, op cit, p 9). No more recent details are available.

A comparison of agricultural employment with other countries (see Table II-21) shows that the West Bank is lower in this regard than most countries of the Middle East, although still much higher than industrialized countries.

Table (II - 21)

Percent of labour force in agriculture in selected countries

	%		%
Egypt	50	Israel	7
Iraq	43	United States	2
Jordan	21	United Kingdom	2
Syria	32	West Bank	(22)

Source: World Development Report 1981, op cit, pp 70-71.

Composition of the agricultural labour force

Besides a marked decline in its aggregate size, the agricultural labour force has undergone several transformations in its composition. This study has identified the following trends:

1. The majority of farm workers are owner-operators. The ratio of hired labourers was reported in 1974 at 21%[1] and it appears to have dropped much further since then. Evidently, the proportion of owner-operators is considerably higher than paid labourers.

2. Women are estimated to provide around 75% of total agricultural labour supply (see section on female labour). Around two thirds of female farm labour is contributed by members of farm families, usually on a seasonal basis.

3. In addition to women, school children and old members of farm families provide important amounts of labour input. According to sampled farmers and technicians the share of this group amounts to 10-15% of all agricultural labour supply.

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1. West Bank Agriculture 1974, op cit, p 8.

4. The contribution of family heads in their farm operations is confined largely to weekends and peak seasons. The rest of their time goes to other careers such as employment in Israel, or in the West Bank itself.

The above mentioned adaptationsin the composition of agricultural labour have helped farmers to avoid much of the impact precipitated by unfavourable transformations in the labour market. Experience acquired in regard to adaptation mechanisms in meeting farm labour needs provides useful indicators to planners of West Bank agriculture.

CHAPTER III

CHAPTER III

POLITICS OF RESOURCE CONFLICT

Palestine is one of the few countries in the world whose ancient history continues to play a major role in shaping its present and future. For this reason it is important to understand some of the fundamental historical transformations whose impact still affects the lives of the population groups inhabiting Palestine. Obviously, the history of Palestine is far too complex to be reviewed in detail in this synopsis. Therefore the emphasis will be placed on revealing the economic ramifications of political change-overs during the past 40 years. The latter section in this chapter deals with the dynamics of resource conflict in the wake of Israeli occupation in 1967.

Arab tribes inhabited Palestine long before the rise of Islam. But a turning point in their presence was marked by Islamic conquest, which resulted in the taking over of greater Syria from the Romans in 636. Shortly after its occupation by Moslem Arabs, Palestine became an integral part of the Islamic Empire, whose capital was located only a few hundred miles away, either in Damascus or Baghdad. The interest of Moslem Caliphs in Palestine was originally motivated by religious beliefs,[1] but it was later immensely deepened by its strategic location as a central junction between the two wings of the Islamic Empire.

After the collapse of the Abbassyte dynasty in Baghdad, the Ottoman Turks had sufficient power to take over moslem countries including Palestine. Their rule extended for about four centuries (1517-1918) during which they managed to extend their empire still further.

1. Jerusalem was cited in the Koran as the third most holy place in Islamic heritage, after Mecca and Medina, both in Saudi Arabia.

But despite their considerable military victories and firm commitment to the Islamic faith, the Ottomans' rule of non-Turkish moslem regions was of a colonial character.

Direct exploitation of economic resources of other countries accelerated in the later years of Ottoman rule with Turkey falling into political and economic decline. The Ottoman Empire disintegrated in the wake of World War I and new occupation powers stepped in, dividing among themselves what was the Islamic Ottoman State.

The economy of Palestine under the Ottomans was characterized by extreme poverty and class exploitation. In their endeavour to rally support of tribal leaders and the wealthy bourgeois, Turkish rulers began to offer their favours to local proteges. The best they had to offer for that purpose was land, the vast majority of which was regarded as "emirate", i.e. owned by the Emire (prince), or in other words, state-owned. By the end of Ottoman rule, most of Palestine's arable land was bestowed on wealthy families, many of whom were in fact Lebanese and Syrian. Palestine was hence affected by feudalism on a scale comparable to that of Iraq and Syria.

Palestine was occupied by British forces in 1918 and was put, shortly after, under British mandate by the League of Nations. That came only one year after the British government made their famous Balfour Declaration in which they "viewed with favour the establishment in Palestine of a national home for the Jewish people and will use their best endeavours to facilitate the achievement of this object".[1]

1. Vivian Bull, op cit, p 19.

During forty years of British mandate, during most of which Palestine was run by pro-zionist governors, the British promise was duly honored. Through enormous support from the Mandatory Government, the Jewish population in Palestine rose from 84,000 (11 percent of total) owning 2 percent of land area in 1922 to 608,000 (33 percent of total) owning 8 percent in 1946.

On November 29, 1947 the United Nations General Assembly passed a resolution recommending the partition of Palestine into two states, one Arab occupying 42 percent of the total area and another Jewish alloted a share of 57 percent. Jerusalem and Bethlehem were to remain under U.N. administration.

Arabs and Moslems outside Palestine were vehemently opposed to the partition plan, which stimulated their generally unstable regimes to pledge their "brotherly" support to hopeful Palestinians. Consequently, armed hostilities erupted. In May 1948 Britain withdrew from Palestine and the Jewish National Council declared the foundation of the State of Israel. The subsequent months witnessed a series of military failures for the Arab forces.

At last, and after Israeli forces extended their control well beyond the partition plan, the war was stopped and bilateral armistice treaties were signed with Israel at Rhodes in 1949. Being the custodian of the eastern front, and in response to British pressure and promises, King Abdullah of Trans-Jordan gave to Israel at Rhodes 450 square kilometres of the area under his control, which by then had come to be known as the West Bank.

By 1950 Palestine had been dismantled into three separate political entities; Israel, the West Bank, and Gaza Strip. The West Bank

was annexed to Jordan, so fulfilling King Abdullah's ambitions for a viable kingdom. The Gaza Strip, on the other hand, was put under Egyptian mandate awaiting further developments.

The West Bank economy prior to 1950

The economy of the country under the British witnessed a limited growth in the service sectors connected with the government, agriculture and handicraft industries. However, it was clear that resources allocated for development purposes in Arab communities were far smaller than those allocated to Jewish communities. Consequently, there was a growing trend towards a division of labour whereby Jewish immigrants took over most industries, international trade and banking. Arabs, on the other hand, were left largely with peasant forms of agriculture, small businesses, public service and workshop industries.

The economy of the interior part of Palestine, which was to become later the West Bank, was more retarded than that of other parts. Its population density was considerably higher, since it encompassed one third of Palestine's Arab population inhabiting only one fifth of the total area. Furthermore, land in that region was of poor topography and least endowed with water resources.

On the whole, therefore, West Bank society prior to 1948 was characterized by a subsistence peasant economy which was heavily dependent for its survival on its economic ties with more prosperous parts of Palestine.

Transition to Jordan

Due to its integral affiliation with other parts of Palestine, the West Bank faced major problems when it was suddenly severed

to form an entity of its own. The economic consequences of this change were particularly grave. The West Bank lost an important market for its domestic produce and a source for a wide range of inputs. It lost access to all Mediterranean ports and had much of its transportation and communication systems disrupted. Wide areas of fertile land owned by West Bankers were lost inside the newly established Jewish state and thousands of jobs were also lost.

The net economic impact of these drastic transformations was severe, but the situation worsened further due to ensuing demographic shifts. The West Bank received about 43 percent of all displaced Palestinian refugees in the late 1940s, estimated at 620,000. This almost tripled the population density on agricultural land, raising it from 200 to 580 persons per square kilometer, and it created excessive strain on scanty resources. The impact was particularly severe during the crisis interval of 1948-52 when the West Bank was plagued by extreme poverty, famine and outbreaks of epidemic diseases. The situation could not have improved much with annexation to Jordan, which itself was until then an extremely impoverished desert kingdom.

Against this background, West Bank Palestinians embarked on two adaptive survival mechanisms, emigration and higher education. Both phenomena proceeded at a considerable pace and have later become instrumental in shaping the socio-economic life in the occupied territories. The Hashemite rule for 18 years gave additional impetus to both phenomena.

Political and economic life under the Hashemites (1949-67)

Palestinians and Jordanians constituted one nation until 1918 when they were seperated into two entities, essentially in

anticipation of the eventual establishment of Israel in Palestine. However, following the installation of Prince Abdullah as ruler of Trans-Jordan in 1921, he developed a long-term aim of annexing those parts of Palestine which would be eventually left for Arabs after the formation of the Jewish state. This, together with competition with Palestinian leaders, resulted in four years of oppressive rule of the West Bank (1948-52) ending with his assassination in 1952 and a further deepening of the rift between the Hashemite monarchy and the Palestinian people.

Jordan's rule of the West Bank during 1950-67 was permeated with anti-Palestinian policies.* The regime was opposed to manifestations of Palestinian identity, on the premise that Palestine no longer existed and loyalty should go the merged state. But the Jordanian leadership appeared to develop deep insecurities arising from the potential hazards posed by ruling a nation which had a history of opposition during the eventful years of British mandate. Consequently, the Jordanian government adopted strong measures for controlling opposition. To help it do so, the Jordanian regime was able to utilise a stratum of Palestinian leaders who actively co-operated with the government in Amman in their capacity as "representatives" of the Palestinian people, exacerbating tensions on the West Bank.

In brief, the Palestinians in Jordan remained until 1967 largely deprived of any genuine form of free expression or any opportunity for expressing an independent identity.

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* Jamil Hilal's book (op cit) has provided an elaborate documentation of Jordan's policies in the West Bank. Some examples on economic and social discrimination will be cited later in this section.

Official prejudice against West Bank residents went beyond political control. The economic policies of successive Jordanian governments were aimed at transforming the West Bank's economy in ways that would make it subservient to that of the East Bank. Public and private investment in industry, trade, services and agriculture were linked into East Bank sectors in compliance with inequitable developmental policies.

A clear indication of the impact of Jordan's discriminatory economic policies is given in Table (III-1) which shows a remarkably faster expansion in East Bank industrial development, as measured by the number of industrial firms and the size of the employed labour force.

Table (III - 1)

Comparative Industrial Development in Jordan 1954-1963

	West Bank		East Bank	
	1954	1963	1954	1963
Number of firms with 4 workers or more	254	353	171	461
Number of employed workers	3562	5504	4512	12710

Sources: 1. Census of Mining and Manufacturing Industries in Jordan, 1954, (Amman: Department of Statistics, 1955).

2. A Survey of Employment in Institutional Firms, 1963, (Amman: Jordan Development Board, 1965), derived from Tables 3 and 4.

The differences in industrial development were not only in the number of employed workers but also in the average size of firms. A survey conducted by the Jordan Development Board revealed that the number of firms with 50 workers or more was, in 1963, 20 firms in the West Bank against 38 in the East Bank.[1]

1. A Survey of Employment in Institutional Firms, op cit, quoted from Jamil Hilal, op cit, p 180.

Discriminatory policies were sustained through the pre-1967 era so that by 1967 the West Bank's share of the government's investment in economic ventures amounted only to 8 percent of its total investments.

Jordan's discriminatory economic policies led to severe ramifications on the West Bank's economic and social life. Unemployment and under-employment rose sharply and were ameliorated only by massive emigration. Thousands of emigrants settled in the East Bank, where the economy was growing at a higher rate, but most of them went to the Gulf states. Wage levels in the East Bank were also considerably higher, eg. 70 percent higher in Amman than in Jerusalem. Per capita income in 1966 amounted to £245 in the West Bank against £322 in the East Bank.[1] This was reflected in sharply different standards of living in both parts of Jordan as evidenced, for instance, by rates of electrification, availability of running water, and ownership of major household appliances (see Table III-2). It is reasonable to assume that differences between East and West Banks increased further by the mid-sixties.

Table (III - 2)

Comparative Standards of Living (1961)

	Percentage of total
Houses connected to electric power	
- All Jordan	17
- West Bank alone	13.3
Availability of running water	
- All Jordan	21.3
- West Bank	11.7
Ownership of refrigerators	
- All Jordan	2.6
- West Bank	1.4

Source: Population Census, 1961 - derived from Tables 3/8, 4/8, 5/8.

1. Jamil Hilal, op cit, p 181.

In 1964 the Palestine Liberation Organisation was founded as a "junior spokesman" for the Palestinians, in addition to Jordan. During the subsequent few years the PLO failed to attract serious attention but the situation changed following the disastrous Arab defeat of 1967 which lead to bitter disappointment in the minds of Arabs and undermined the credibility of many of their regimes. In contrast, Palestinians and Arabs began to view the emergence of armed Palestinian resistence with respect and even admiration, and hence provided such groups with massive material and moral support. Within two years of the June War, Palestinian commandos (whose major force was Fateh) had become a threat to Israel's security.

Despite assaults from Israel and tragic confrontations with some Arab regimes, Palestinian armed groups grew in ability and succeeded later in coordinating their fight under the umbrella of the Palestine Liberation Organisation. In 1974 the PLO culminated its political struggle for identity by its recognition at the Rabat Arab Summit as the "legitimate and sole representative of the Palestinian people." During the 1970s the PLO succeeded in gaining stronger international support and recognition, until it came close to being a de facto regime in exile.

The 1970s also witnessed an important structural change in the Israeli ruling hierarchy. After almost thirty years in power, Israel's Labour coalition lost the 1977 Knesset elections to the right-wing Likud opposition, headed by Menachem Begin. This provided ultra-religious groups and Zionist extremists with their opportunity to attempt to create a greater Israel.

Another major development came in the fall of 1977 following Sadat's surprising visit to Israel. In 1978 Egypt, Israel and the United

States signed the Camp David Accords calling for Israel's phased withdrawal from Sinai and normalization of relations between Egypt and Israel. On the Palestinian question, Israel and Egypt were supposed to reach an agreement which would give Palestinians in "Judea and Samaria" full autonomy, pending final agreement on the future of that territory five years later. The PLO and all other Arab regimes (except Sudan) were opposed to the unilateral Egyptian-Israeli peace treaty. Despite American and Egyptian promises of "full autonomy", most Palestinians believed that Begin held a completely different view, and that autonomy meant to him no more than a means to legalize occupation. This would overcome Palestinian resistence and diffuse the international consensus against Israel. According to the dominant Palestinian view, Israel interpreted Camp David as giving it more control in the West Bank and other occupied territories. It immediately launched an aggressive settlement policy to which Americans and Egyptians expressed no more than verbal opposition. In the view of the Palestinians, they were to pay the price of returning Sinai to Egypt.

The political background for the resource conflict

The West Bank was caught by Israeli occupation in a state of extreme vulnerability and fragility, both in its political and socio-economic structures. This, as we shall see later, has proved of assistance to Israel in fulfilling its own ambitions in the occupied territories. The West Bank was subjected under Israel to forms of exploitation which were distinctly different from those practiced under Jordan.

Notwithstanding certain differences, the official policies regarding the occupied territories of successive Israeli governments have all

aimed at achieving the following objectives:

a. Eventual annexation of most or all occupied regions. In June 1967 Levi Eshkol's government annexed East Jerusalem after a decision was taken to expand its municipal boundaries by several areas. In December 1981 Begin's government annexed the Syrian Golan Heights. There is speculation at the time of writing (April 1982) that Begin might take the anticipated step of annexing the West Bank in the near future, shortly after withdrawing from Sinai.

b. Colonial exploitation of economic resources available in relatively abundant quantities in the occupied territories. Although over-shadowed by more volatile political issues the exploitation of these resources has led to far-reaching consequences on Israel and the occupied territories themselves. Annexation measures and exploitation policies will be discussed in Chapters III, IV, and V.

c. Controlling efforts which might eventually facilitate the emergence of a Palestinian state. This bears not only on Israel's foreign policy but further permeates its day to day practices in the occupied territories.

There are substantial differences among all major Israeli political parties in regard to their long-term policies in the occupied territories.* The ruling Likud coalition and the Labour opposition are both convinced that the entire territory encompassed by Mandatory Palestine falls entirely within the boundaires of Eretz (greater) Israel, but they differ significantly in the methods they use to realize their objectives. The Labour party is deeply apprehensive

* The Communist Rakah party (with four members in the Kenneset out of 120) and Shelli (with two MK's) are the only parties which recognize the rights of the Palestinians to self-determination and statehood. The mood among Israeli voters, however, is overwhelmingly opposed to both ideas.

of the demographic and social consequences which might result from incorporating so many Palestinians into Israel itself. The ensuing dangers, they believe, more than justify surrendering the densely populated parts of the West Bank and Gaza Strip. They would like to see those regions return under Jordanian sovereignty within an arrangement which secures Israel's basic interests. Among the most famous versions of this proposal are the Allon Scheme and the Federal State Scheme proposed by King Hussein in 1972. Both were floated and then stalled for various reasons. But there are clear indications that the Labour party still adheres to the same principles of territorial concessions advocated in Allon's scheme.

The ruling Likud coalition, being strongly committed to a scriptural basis, is more adamant on annexation issues. Mr Begin has consistently described the new territories as "liberated" and not occupied. His record for the past five years indicates clearly that his claims are not pure rhetoric. His government's policies regarding the West Bank, including his understanding of Camp David Accords, demonstrate his determination to annex the West Bank region. The demographic imbalance does not seem to worry the Likud and right-wing groups (most notably Gush Emonim), because they are confident that Israel will be able to exercise measures which will encourage Palestinian residents to leave. This, in the researcher's experience, is what Begin's government has attempted to do since its accession to power in 1977. Many of the measures taken in this regard will be discussed and evaluated later in this thesis.

Land

Land is probably the most important requisite in the process of agricultural production, particularly in underdeveloped countries,

where peasant farming is markedly land and labour intensive. In addition to its economic significance, the land question lies at the heart of the Palestinian-Israeli conflict.

It is evident that Israel is working towards eventual absorbtion of all West Bank land within its borders as part of Eretz Israel. The evidence in this regard is overwhelming. A particularly dramatic document is the newly released "confidential" Droblis Plan which calls for the addition of 46 settlements (16,000 families) in the West Bank at the cost of IL 32 billions (see map on next page for the cluster grouping of existing and suggested settlements). It is clear from this map that Israel's settlement policy is motivated more by annexation hopes rather than by the claimed security hazards.[1]

Conversely, Palestinians consider their sovereignity on the West Bank and Gaza Strip as the minimum that they might agree to in the context of a political settlement.* With Israel having control of the occupied territories since 1967, it has been concerned with realising its long-term aims. This section discusses some of the measures employed in this regard and their ramifications on the West Bank agriculture.

Post-occupation trends in land use

Analysis of secular trends in land use reveals that significant transformations have taken place since 1967. Table (III-3) presents a summary of these trends as derived from Israeli statistics.

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1. Jerusalem Post, May 8, 1981, p 1.

* Although this is not stated officially, the PLO has made its intentions clear by its implicit acceptance of the Saudi "Fahd Peace Plan", which calls for the recognition of Israel in return to the establishment of a Palestinian State in the West Bank and Gaza Strip.

A particularly worrying fact for Palestinians in the West Bank, where de facto land use is more powerful than legal claims, is to see that less than one third of its land area is under cultivation. Still worse, Table (III-3) indicates a drop of some 50,000 donums in the area under cultivation during 1968-78. In fact the actual drop in area under active cultivation is certainly many times larger, since official figures make no reference to vast areas of deserted tree orchards which, nominally, are still in production.

Table (III-3)

Trends in land use, 1968-1978

(thousand donums)

	1968	1978
Total area	5572	5572
Uncultivated for all reasons	3889	3937
% of all are	69.8	70.7
Area under actual cultivation	1683	1635
% of total area	30.2	29.3
Area under irrigation	57	90
% of cultivated area	3.3	5.5

Source: Mose Levi, Judea and Samaria Agriculture, (Beit Eil: Department of Agriculture in the Military Administration, 1978), p 8.

Surprisingly, Table (III-3) shows a rise of 55 percent in the area under irrigation. Although there is no accurate data, the researcher believes that, based on his own field work, the physical area under irrigation has probably stayed about the same. The drop in area caused by the decline in the number of artesian wells and closure of large stretches in the Jordan Valley is just

about offset by rising efficiency in water use. Alternatively, the recorded rise in area under irrigation is probably induced by a sharp increase in multiple cropping, made possible by the introduction of modern farming techniques.

Land politics

Looking at the entire West Bank land from a political perspective, one immediately notes that it lies at the heart of the Palestinian-Israeli conflict. Notwithstanding economic and security considerations advocated by both sides, the West Bank happens to contain the largest concentration of religious sites cherished by Christians, Moslems, and Jews. Following its victory in 1967, Israel had launched an "assault" on West Bank land of such a sweeping nature that it has been rightly described as the "great land barrier to Palestine peace."[1]

Israel has taken advantage of several discrepencies in the prevailing forms of land ownership in order to achieve territorial expansion (see Table III-4). It started first by proclaiming itself as the legitimate heir to all state land. This gave it automatic control over some 12 percent of all land area. It then assumed control on land (and other property) owned by absentee Palestinians. Subsequently, it approved and encouraged transfer of West Bank land into Israeli hands, even through processes of forged deals.[2]

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1. The Great Land Barrier to Palestine Peace, by David Lennon in the Financial Times, October 29, 1979, p 12.

2. A recent example is the sale of 569 donums in the village of Bill'in (Ramallah district) which was effected by two local people using forged documents. The deal was invalidated by a court order on September 20, 1981 (Ref: Al-Qods Daily, September 21, 1981). But a few days later (September 28th) the Military Administration defied that order by proclaiming the same piece of land and three thousand donums more as "training" area, hence forbidden for civilian use. (Ref: Al-Qods Daily, September 29, 1981).

Table (III - 4)

Distribution of land by form of ownership

(in thousand donums)

Type of ownership	Area	% of total
Total	5,856	100.0
Privately owned	3,200	54.7
Absentee owners	430	7.3
State land	696	11.9
Land without clear title	1,500	25.6
Owned by Jews (prior to 1948)	30	0.5

Source: Israel's Ministry of Defence, quoted by David Lennon in the Financial Times, October 29, 1979).

But more significantly the Military Administration has confiscated or closed extensive areas of privately owned land, initially for "security" reasons, but turning them later into civilian settlements. At other times confiscation is explicitly effected for the purpose of establishing settlements and constructing needed roads, all for "public interests".

It is very difficult to give accurate estimates of the areas which have been requisitioned by Israel through various means, especially in that the first Begin Government was particularly aggressive on West Bank land during its last year in office. But a relatively old and conservative estimate puts this figure at 1,488 million donums (34 percent of total area) distributed as follows:[1]

donums	
61,000	Privately owned and confiscated for military necessities
80,000	"Purchased" by Israelis
42,151	Expropriated for public purposes
970,000	Closed for military purposes
696,000	State land
30,000	Previously owned by Jews

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1. David Lennon, op cit.

Adding to these figures the area of land with unclear title (1.5 million donums), which Israel decided recently to classify state-owned, and the area owned by absentee owners (430,000 donums), this puts under Israeli control around 65 percent of all West Bank land area.[1]

Israel's assault on land resources in the occupied territories has had a deep and multi-faceted impact on West Bank agriculture. The major consequences of these policies are outlined below:

1. Putting large areas of land out of production through confiscation and security closures. Up to 1979 some 13 percent of all agricultural land was lost through such measures.[2] The situation has been particularly grave in the Jordan Valley and adjacent hills in the north, where 40 percent of arable land is farmed by 2000 Israeli settlers and 22,000 Palestinians are alloted the remaining 60 percent.[3]

2. Israel's arbitrary and sweeping land harrassments have left mounting fears among farmers regarding the security of their holdings. Most farmers have developed a stronger reticence towards all projects which demand large capital outlays in the form of long-term fixed assets. A prominent example of such projects is the reclamation of hilly land and maintenance of stone walls. This trend has been further reinforced, as we shall see later, by a sharply rising opportunity cost of labour and capital and gradual shift in the price structure against farm produce.

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1. Ibid.
2. Economic Resources of the West Bank and their Impact on the Israeli Economy, op cit, p 11.
3. David Lennon, op cit.

Water

Water resources and politics occupy a particularly significant position on the agenda of the Palestinian-Israeli conflict. Both sides realize the far-reaching consequences of measures taken in regard to the utilization and control of available water reserves. This subject, evidently, is so important and complex that it needs continuous monitoring through specialized studies dealing with its technical, economic, and political attributes. This section, however, deals only with the politics of water use and explores Israel's water policies in the occupied territories. More will be written on water resources and their use in a later section.

Estimates of consumption

Total water consumption in the West Bank is estimated at about 100 million cubic meters (mcm) per year, of which 90 percent is used in agriculture.[1] Averaged on a per capita basis, overall water consumption in the West Bank is less than one third of the level in Israel (see Table III-5). Disparity in domestic consumption is even more dramatic.

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1. Hisham Awartani, Water Resources and Politics, op cit, p 18.

Table (III - 5)

Water consumption in the West Bank and Israel

(in million cubic meters)

	West Bank[1]	Israel[2]
Agriculture	90	1325
Industry	(included below)	95
Domestic purposes	10	300
	100	1720
Per capita consumption (cubic meters):		
Overall	142	537
Domestic purposes	13	86

Source: 1. Awartani, op cit, p 23
2. KIDMA, Israel Journal of Development, No 13/1977, p 4.

The amount of usable reserves varies considerably from year to year, but on the average it is estimated at about 850 mcm[1], distributed as follows:

	million cubic meters
Used by Israel, mostly through surface run-off and West-bound through underground acquifers	550
Used by West Bank Arabs	100
Usec by Israeli settlers[2]	50
Potential surplus which can be exploited[3]	150

The above-mentioned figures highlight three fundamental features of water politics, namely:

a. Low share of water exploited by local residents (about 12 percent of total usable reserves).

1. West Bank Hydrology (London: Rofe and Raffety Consulting Engineers, 1965), p 15.

2. According to Bonet and Blaide (see reference below) 53 mcm will be required for irrigation purposes Israeli settlements in the Jordan Valley, of which 37 mcm should be obtained from West Bank reserves.

3. Y Bonet and U Blaide, op cit, p 17.

b. Very high share exploited by Israel (about 70 percent of total).

c. The presence of an attractive usable surplus of about 160 mcm.

Israeli water policies

Israel's water policies in the West Bank are underlied by three fundamental motives, namely:

1. Preservation of the West Bank as a catchment area for a major part of Israel's water supply. It has been indicated that about one third of Israel's renewable reserves[1] (i.e. around 550 million cubic meters) originate in the West Bank, mostly through the Cenomanian/Turonian acquifer flowing westward underneath West Bank hills toward the coastal areas inside the pre-1967 border. Israel is certainly anxious to safeguard what it conceives as its water rights in the West Bank, apparently with only little deference to the water needs of the Palestinian residents.

2. Israel faces a large and growing shortage in its water supply. Additional amounts of water are needed to support more intensive agriculture in the Negev, where large areas could be put under irrigation, and also for serving its growing industrial and domestic needs. The deficit is further aggravated by Israel's settlement policy, both in the occupied territories and inside Israel itself. According to the Water Commissioner, Israel is expected to face a deficit of 450 million cubic meters by 1985.[2]

Israel has tried with only little success to meet its additional

1. Barbara Smith, The Politics of Water on the West Bank, published in the Middle East International, London, 1980, p 26.

2. Ha'arets, June 5, 1978, quoted from Davis, op cit, p 5.

water needs through such means as desalination plants, reclamation of sewage water, and raising efficiency of water use.[1] Consequently, there is a growing conviction in Israel that the only real opportunity to solve Israel's "grave" water problems lies in tapping new resources lying beyond its borders, namely in the West Bank and South Lebanon.[2] Conforming with this policy, Israel is beginning to exploit surplus reserves in the West Bank which, as indicated earlier, amount to more than 150 mcm per year, concentrated mostly in the eastern drainage basin. A large part of this surplus will be exploited in meeting the rapidly growing needs of West Bank Israeli settlements.

3. In pursuance to its opposition to the establishment of a Palestinian state, Israel appears keen on preempting the economic viability of such a state should that be considered as a solution to the Palestinian problem. Even in the event that a Palestinian entity is eventually established, Israel seems intent on undermining its productive base and maintaining it subservient to its own economy. Constricting water supplies available to West Bank agriculture would be an effective step in that direction.

With the onset of occupation, Israel had its main opportunity to achieve these objectives. It immediately assumed total control of all water resources and started to promulgate policies and measures which serve its interests. A cornerstone of Israel's

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1. For a comprehensive evaluation of Israel's water crisis and its alternative solutions, the reader is referred to Uri Davis, et al, "Israel's Water Policies", Journal of Palestinian Studies, Vol IX, No 2, Winter 1980.

2. This is clear enough in the famous statement made by Ben Gurion ... "We should remember that the continuity of the Jewish state necessitates that the water of Litani and Jordan rivers be included within our borders". Ma'ariv, April 18, 1972.

water policies in that direction is the ban imposed on further drilling of tube wells for agricultural uses (only one has been drilled since 1967), and attempts to minimize the discharging capacity of existing wells.

The Water Department has installed meters in all wells and imposed a ceiling on quantities to be discharged. Violations of overpumping are taken to military courts. Conversely, Israeli settlers have drilled many deep-bore wells with a considerably stronger discharging capacity. While Arab wells tap only a shallow acquifer, Israeli wells go three times deeper (around 500 meters) where they reach much richer acquifers. This has inflicted serious damage on neighbouring Arab wells and springs, causing many of them to go completely dry.[1]

The number of Israeli wells and their annual discharge is not published. According to official data for 1977-78 there were 17 wells in the Jordan Valley which discharged during that year more than one third of the quantity produced by 314 Arab wells (see Table II-22). However, the actual number of Israeli-owned or controlled wells is certainly larger. There is evidence that there are at least 27 wells owned directly by Israeli settlements (i.e. the Mekorot Water Company). In addition, seven other wells are supposed to be utilized for domestic purposes by Arab communities but owned by the Water Department in the Military Administration. The ultimate proprietorship and utilization of

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1. Two examples are those of Bardala (North Jordan Valley) and Auja (near Jericho). The former had its two wells and 11 springs dried out after a neighbouring settlement drilled a deep-bore well in 1977. Auja springs and wells had similar problems in the summer of 1978.

these wells is certainly questionable, given Israel's need for additional amounts of water to meet the needs of its growing settlements in the West Bank.

Surface water resources, on the other hand, are also neglected. The Military Administration hinders efforts to modernise water carrying techniques or the construction of collection dams. A good example is its attitude regarding the project proposed by the Wadi Fara'a Committee which aims at replacing the 16 kilometers of open concrete canal with metallic pipes. A study conducted by a leading major engineering firm has demonstrated a markedly positive feasibility for the proposed project. Consequently, ANERA* agreed to support it and earmarked for this purpose $100,000. The Israeli government, however, refused to permit ANERA to pay its grant to the said project and refused to allow Wadi Fara'a Committee raise funds from other sources.

Labour in Israel

One year after occupation, and in response to a labour shortage emerging in Israel, the Israeli government permitted residents in the occupied territories to seek employment in Israel. This may have been the most important single development on the West Bank from a socio-economic point of view.

In less than four years after occupation the percentage of West Bank labourers employed in Israel climbed to around 40 percent of the total active labour force. Table (III-6) shows that their percentage has since then stabilized at 32-35 percent. The actual figure may in fact be 5-10 percent higher due to inadequate statistics for labourers employed without going through the Labour Exchange.

* American Near-East Refugee Aid

Table (III - 6)

Distribution of labour force by place of work

	Number of Workers (000)			Percentage		
	1970	1975	1979	1979	1975	1979
In the West Bank	99.8	91.9	93.0	87.2	69.3	70.0
In Israel	14.7	40.4	39.8	12.8	30.7	30.0
Total	114.5	131.5	132.8	100.0	100.0	100.0

Source: Statistical Abstract of Israel 1980, op cit, p 696.

The immediate stimulus for the powerful mobility of West Bank workers into Israel was spurred initially by the wide gap in wages which then existed between the two territories and to the very low rate of economic activity in the West Bank during the two years following occupation. Due to closer links between the labour markets in both territories, however, wage levels in the West Bank have been forced up rapidly until they have become very close to those earned by West Bankers employed in Israel, if other non-monetary benefits are taken into account (see Table III-7).

Table (III - 7)

Comparison of wages in the West Bank and Israel

(IL - per day)

West Bankers employed in:	1970	1975	1979
West Bank	7.9	39.6	166.0
Israel	11.8	44.6	198.7

Source: Statistical Abstract of Israel 1980, op cit, pp 697 & 700.

The consequences of labour migration into Israel on the West Bank economy are profound and of a mixed character. The most visible impact on the positive side has ensued from the significant contribution of wage remittances to the West Bank

economy, which has amounted to 25-30 percent of its GNP.[1] This has undoubtedly helped to cause a significant rise in the standard of living of West Bank families, particularly among under-privileged income groups. Even more significant is the possibility that the employment of west Bankers in Israel has prevented what could have been a massive population exodus to Jordan and the Gulf states, this being largely restricted to well educated people not required in Israeli labour markets.

The negative consequences of this process, however, are no less significant though they may be less immediate. Most importantly it is feared that the labour drain into Israel initiated and sustained a severe stunting effect on the indigenous production base of the occupied territories. While it is true that labour flow to Israel has virtually eliminated unemployment among unskilled and semi-skilled labourers it has, on the other hand, stimulated a massive drain of farmers, artisans, and small businessmen into hired labour. This has accelerated the desertion of farming in marginal land and resulted in the dismantling of many small businesses which, in contrast to Israeli firms, do not have the financial and technological resources needed to absorb a sharp rise in prevailing wages. Consequently, local markets were flooded with Israeli goods purchased largely by wage earnings from Israel. This has minimized the "multiplier effect" of those earnings since they are quickly re-syphoned into Israel. In the meantime the occupied territories have been turned to a non-productive consumer society whose relative "prosperity" hinges on the continuity of their labour connections with Israel.

The potential political hazards of the high remittances/high consumerism formula are obviously grave. But they could be

1. Van Ardakie, op cit, p 64. More recent figures on national accounts do not make distinction between wage earnings in Israel and the West Bank.

even more catastrophic should Egypt and Israel go far enough in the "normalization" of their relations to the point when Egyptian workers are permitted to seek employment in Israel, hence displacing Palestinain workers employed there. Such risks should be seriously considered when formulating a strategy of agricultural development.

In strictly numerical terms, the relative share of West Bank and Gaza Strip labour in the aggregate Israeli work force is not great, rarely exceeding 7 percent. But their significance to the Israeli economy, however, is far out of proportion to their size. This could be perceived through a number of illustrative indicators, such as the following:

1. Labourers from the occupied territories are evidently much cheaper than comparable Israeli workers. According to Bregman Palestinian labourers earn around 50 percent less than their Israeli counterparts doing the same kind of work.[1] An analysis of aggregate wage earnings by the National Insurance Institute reveals an even more dramatic gap between wages of both groups (see Table III-8).

Table (III - 8)

Number of posts, total wages, and average monthly wage per post (Israel - 1979).

	Number of jobs (000)	Total wages (IL mill)	Average wage IL/post
Including workers from the territories	1,153.1	14,322.9	12,420
Excluding workers from the territories	1,103.7	14,050.3	12,730
Workers from the occupied territories	49.4	272.6	5,518

Source: Statistical Abstract of Israel 1980, op cit, p 339.

1. Arie Bregman, Economic Growth in the Administered Areas 1968-73, (Jerusalem: Research Department in the Bank of Israel, 1974) p 37.

2. Labourers from the occupied territories are heavily concentrated in the construction sector (48%) and in other manual occupations which are shunned by Israeli workers because, in general, they consider them dirty or poorly remunerative. This trend is further accentuated by the constant availability of cheap workers commuting to Israel from the occupied territories. Despite turbulent labour relations in Israel and rapidly rising inflation rates, cheap Arab labour has helped buttress rapid development in Israel's huge construction sector.

3. Labourers from the occupied territories are characterized by a high spatial and inter-factory mobility. Because they are denied any form of collective bargaining, they can be hired and fired at will, and in the process seek alternative jobs in different locations or occupations. This has provided Israeli firms with marked security against a background of chronically tense relations with Jewish labour unions.

4. The higher wages and standards of living in the occupied territories have stimulated a substantial boost in the purchasing power of their residents. The benefits of this consumption surge are reaped largely by Israeli manufacturers who provide the two territories with about 90% of its imported goods (see section on Trade in Chapter V).

On balance, Israel has gained substantial economic and political benefits by integrating the Palestinian labour force into its economy, particularly more so that these labourers commute daily to their home towns. And in order to facilitate this process and bolster its "positive" effect, the Military Administration has opened many recruitment offices and a number of vocational training centres. These centres offer short training courses in

manual occupations demanded by Israeli firms which, "merely perpetuates the bias that confines Palestinian workers to the role of manual labourers in the Israeli economy.[1]

Conclusions

The basic elements of the continuing conflict over major West Bank resources could be summarized as follows:

1. Acquisition and control of land is the focal point in the conflict. Israel strives in various ways to claim as much as possible of the occupied territories. In addition to fostering direct measures to facilitate achieving this objective, Israel appears determined to curtail to a minimum all such forms of land use which would enable local residents to expand the area they utilize. This applies most importantly to those forms of land use which involve visible and long-term attachment to land, such as urban uses and certain forms of agriculture (eg. fruit trees).

2. Israel considers the West Bank water resources as an integral part of its own. By minimizing water supply available for use by local residents, it helps reduce their attachment to land, weaken their economic base, and either increase their integration with Israel's economy, or even facilitate emigration.

3. Israel's labour policy in the West Bank aims at two major objectives. The more desired objective is to minimuze the size of local population by facilitating emigration. But Israel would like to see those who stay become subordinated to its own economy instead of expanding their production base at home.

1. Van Arkadie, op cit, p 63.

CHAPTER IV

CHAPTER IV

THE CONFLICT IN SUPPORTIVE INSTITUTIONS

Chapter III was aimed at discussing the fundamental dimensions of the conflict on West Bank resources, mainly, land, water and labour. It was argued then that Israel followed a wide range of policies which aimed at the widest possible acquisition of land, and at exploiting surplus water and labour resources. The long-term objective is well defined: eventual annexation of all the West Bank.

In fulfilment of its aims Israel appears to be limiting service institutions and infrastructures in ways which are most condusive to its interests. This chapter pursues the "conflict" theme described earlier, but this time with reference to those institutions bearing on the process of agricultural development.

A - Agricultural education

Vocational training in agriculture is provided through two schools, the Khadourie Agricultural Institute and A'rroub Agricultural School.

The Khadourie Agricultural Institute was founded by the British Mandate in 1930 and it has produced since then some hundreds of agricultural technicians.

In the half a century since its establishment, Khadour has undoubtedly achieved some success in meeting the needs of Palestine and Jordan for white-collar agricultural technicians, mainly as teachers of agriculture and biology, or as extension agents in the department of agriculture. Consequently its curricula have gradually evolved to produce academically-oriented graduates, instead of field motivated practitioners. Throughout its long

history, perhaps less than two dozen Khadourie graduates have entered farming as a full-time profession. Ironically, it still goes on producing teacher trainees, most of whom end in Jordan and the Gulf states.

A'rroub Agricultural School was established in 1962 (near Hebron) with the twin objectives of producing qualified farmers, while simultaneously qualifying graduates to continue their college education if they wish to do so. This confused recipe of objectives proved to be a failure and the school developed a poor reputation.

Following occupation, the situation at Khadourie and A'rroub has deteriorated. Graduates of both schools are largely redundant at home, and the vast majority of them are forced to emigrate. The Military Administration, on the other hand, is opposed to all improvements which may entail additional budget demands[1] or, for that matter, may help graduates take farming as their profession.

Although there is not yet a college of agriculture in any one of its three universities, the West Bank is certainly not deficient in graduates of agriculture. A large number of students study agriculture in foreign universities, almost always because of their failure to study a more attractive profession, such as medicine or engineering. And because of a clearly slanted theoretical orientation in neighbouring colleges of agriculture, their graduates are biased against practicing farming. This attitude is further deepened by total absence of institutional sources of credit. Upon their graduation, therefore, West Bank

1. Interview with Khadourie's principal, May 20, 1981.

agriculturalists are preoccupied with their desire to seek a paid job in the government service or other public institutions. And if they fail to do that they emigrate to neighbouring countries.

B - Agricultural extension and research

Agricultural extension was undertaken prior to occupation by two exclusive institutions, the Department of Extension (in the Ministry of Agriculture) and service technicians employed by dealers of farm supplies. More respondents to the researcher's enquiries involved in commercial types of farming, such as poultry, vegetables and citrus, seem to agree that servicemen or advisers from private firms have played a major role in meeting their technical demands. In fact their role in certain sectors, notably poultry, was considered to be far more significant than that of official extension agents. Their effectiveness was further accentuated, as we shall see later, by the important role played by agricultural firms in providing their customers with generous seasonal credit facilities.

As most agricultural companies were based in Amman, their extension and credit services came to an abrupt end immediately after occupation. This left all extension assignments to an ill-prepared and war-shattered department of agriculture. Like all other civil service institutions, the Department of Agriculture fell under the direct custody of the Military Administration in the Ministry of Defence.

Agricultural policies of the Military Administration

During the 3 to 4 years following occupation, the Department of Agriculture in the Military Administration pursued an active role in modernizing West Bank agriculture. This interest was translated

into several ambitious policies and practices, starting with the addition of some 18 agronomists to the staff of extension agents. Demonstration plots on new crops and techniques were organized with such an intensity that they practically covered all farming areas. Credit facilities and food aid were advanced to pioneering farmers at concessional terms. Marketing of produce into Jordan was aggressively promoted through a liberal export-subsidization scheme. The flow of farm produce to Israel was permitted, although at a small scale and when it did not compete with local produce. As a result of official enthusiasm, production practices were markedly modernized and certain patterns of agriculture undoubtedly achieved high rates of growth.

But official interest in West Bank agricultural development proved to be short-lived. Favourable policies were gradually superseded by noticeably depressive policies. This change seems to have been motivated by a number of economic and political factors. In the first place the Israeli economy itself was rapidly entering a severe recession which was accompanied by a drastic curb in public expenditure which included heavy cuts in the budget of agriculture.

Still more importantly Israel began to realize that it should address itself to countering arguments advocating the establishment of a Palestinian State, mainly by pre-empting the production base of its potential components: the West Bank and Gaza Strip. Furthermore, Israel's economic policies in the occupied territories appear motivated partly by a colonial intent, whether in terms of exploiting their resources or cultivating their sizeable consumption potential. Expansion in local production would,

from Israel's point of view, jeopardize the flow of Israeli goods to the occupied territories and might depress prices in Israel itself.

Against this mixed background, the agricultural policy of the Military Administration seems to rest, at least for the present, on the following guidelines:

1. Reducing the area under active cultivation to a minimum size in an effort to facilitate quiet transfer of land to Israeli hands. This, as explained in the section on land resources, has been accomplished by a wide range of land confiscation and closure policies.
2. Curtailing all patterns of farming which entail visible and long-term attachment of farmers to arable land. Foremost, this applies to olives, grapes, and almonds. In contrast, the Department is far more interested in promoting annual field and vegetable crops. Lop-sided sectoral emphasis is spelled out clearly in the Annual Plans prepared by the senior Israeli officials in the Department of Agriculture.[1]
3. Controlling all water resources and restricting water use in Arab agriculture to the minimum, other usable reserves going to Israeli settlements.
4. Expediting the mobility of labour from rural communities into Israel or, alternatively, to neighbouring countries.
5. Exploiting untransferable abundant resources, particularly immobile labour (eg old men and village women), in producing

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1. Examples: All pest control demonstrations for olives have been stopped since the early seventies; distribution of seedlings requires approval by senior officials; seed oils and Spanish olive oil are permitted in at concessional terms.

commodities contracted by Israeli firms. Notable examples are onion seeds, cantaloupes, and medicinal crops. The Department of Agriculture acts as an active liaison between farmers and Israeli exporters.[1]

6. Restraining growth in the territories of capital and technology-intensive sectors, since these are conceived by policy makers as Israeli specialities. This includes such sectors as poultry, livestock, and high-value crops.[2]
7. Cirumventing Arab boycott regulations by facilitating exportation of local produce and thereafter meeting local consumption needs from Israel. Most important examples are citrus, banana, and vegetables.[3] This practice helps to avoid sending across the frontier bridges goods of Israeli origin.

Structural Organization

The translation of the above-mentioned policies into practice is entrusted to a committee representing the Coordinator of the Occupied Territories, the economic adviser of the General Governor, the Minister of Agriculture, and the Officer-in-Charge of Agriculture at the Military Headquarters. No Palestinian is involved in the initial planning process, despite the existence of what is officially described as the Planning Unit, staffed by two senior Arab technicians.

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1. This is so much emphasized by the Department of Agriculture that the Officer-in-Charge of Agriculture declared the coming agricultural year as the "Export Year" and mobilized the entire official machinery to bring about stronger connections between farmers and Agresco (Ref: The Agricultural Journal, No 2, Sept 1981, p 7).
2. According to Annual Plans for 1980-81, extension agents are instructed to restrict their services to farmers in these sectors to verbal advice, and only when approached by farmers themselves. (Ref: Annual Plans for 1980-81, Department of Agriculture, pp 3-4.
3. The Military Administration paid (until 1978) generous subsidies on exports to Jordan in a way which spurred infiltration of Israeli produce, disguised by a West Bank label.

The implementation of the agricultural policy formulated at the top by the afore-said planning committee is delegated to a small unit of Israeli officers in the Military Headquarters. The director of this unit, described as the Officer-in-Charge of Agriculture, is entrusted with the status of Minister of Agriculture, supposedly as defined in Jordanain laws. Actual contacts with farmers, on the other hand, are performed through six district offices of agriculture staffed by Arabs. Each district office includes 6 - 10 extension agents and a minimal number of supporting staff. The total number of college-educated extension agents is 46 serving 400 villages and seven agricultural stations. Table (IV-1) shows the distribution of all technical staff in the Department of Agricultural Extension and Research, as it was in March 1981. Each district office is supervized by an Israeli adviser who acts as their liaison with the head-office at Beit Eil* and, more importantly, makes sure that work proceeds according to policy. In 1980, Israeli district advisers even asked for counter-signing of all official mail in their respective districts, but their request was met with unanimous objection from local Arab officials.

* The location of the headquarters of the Military Administration, 2 kilometers to the north of Ramallah.

Table (IV - 1)

Number and distribution of technical staff

(March 1981)

District	College graduates	Agricultural high schools	Non-diplomate	Total
Total	46	24	12	82
Tulkarm	6	7	-	13
Jenin	5	4	1	10
Nablus	5	4	2	11
Ramallah-Bethlehem	13	3	3	19
Jericho	8	1	2	11
Hebron	7	5	4	16
Planning unit	2	-	-	2

Source: Files of the Department of Agriculture.

Agricultural research prior to occupation was undertaken by the Research Department of Amman through several experimental stations representing all major farming regions. The department was started in 1958 through massive US AID financial and technical support, which enabled it to make rapid progress in building fully-fledged and modern research infrastructures, serving both parts of Jordan. On the eve of occupation the West Bank had one major research station in the Jordan Valley (Wadi Fara'a) and five smaller ones located in other important production regions and serving localized needs. According to available records, Wadi Fara'a Station had in 1962 a resident technical staff consisting of 3 PhDs, 4 MSc's, and 6 BSc's.[1]

1. Files of Wadi Fara'a Station.

Following occupation, the situation started to deteriorate. Early on, the activities of Wadi Fara'a Station (only four miles away from the Jordan River) were drastically curtailed for security reasons. Furthermore, all research activities were put under the direct supervision of Israeli researchers, mostly of the Volcani Institute. The results were published in Hebrew and were scarcely accessible for local users.[1] Recognizing the Volcani Institute as serving West Bank research needs, the Military Administration passed to it the largest part of the West Bank research budget for the purpose of setting up a modern laboratory for olives and grapes.

In order to facilitate the process of technical "annexation" the Military Administration established what it called the Research Office in Ramallah as a coordinator between Volcani technicians and local extension agents. Although it may be argued that this formula has probably helped accelerate technological change, yet it has also undermined the local research base in the West Bank itself.

The situation deteriorated much faster after 1979, essentially due to more stringent budget restrictions. All research stations were turned over to commercial production and their "surplus" staff were either transferred or dismissed. In seven stations there were left only four college-educated technicians (see Table IV-2). The Research Office in Ramallah was closed and its director,

1. The researcher was able to visit the Olive and Grape Research Institute at Volcani only after lengthy contacts. He was given copies of several research studies on olive fertilization and picking hormones. All reports were in Hebrew or English, and they were published in a form which neither ordinary farmers nor extension agents could understand. The author has failed to find any one of these publications on the West Bank itself, even at the Department of Research in Ramallah. This casts further doubts on the usefulness of Volcani research to West Bank agriculture.

a long-time FAO expert, was dismissed. By 1980 agricultural research on the West Bank itself was practically abolished and entrusted instead to Israeli hands.

Table (IV - 2)

Number of college graduates on West Bank research stations

Name of station	1978	1980
Total	12	4
Beit Kad	2	1
Kabatia	1	-
Tulkarm	1	-
Askar	1	-
Arroub	2	1
Jericho	2	1
Para'a	3	1

Source: Files of research stations.

Evaluation of the Department's Record

The services extended by the Department of Agriculture were rated as poor by all farmers and leaders of rural communities who were interviewed in the course of this study. The same feeling was reiterated by directors of district offices and extension agents themselves. This prompted the researcher to explore this issue with various concerned people. The following is a summary of their responses regarding the factors responsible for current stagnation in the Department of Agriculture:

1. Very low salaries of Arabs working in the Department. The purchasing value of salaries has fallen steeply with soaring inflation rates, and it generally covers no more than 60 percent of subsistence requirements for a medium-size family. Israeli civil servants, in contrast, receive more than twice

their Arab counterparts.[1] This situation has forced a large number of qualified technicians to leave their jobs and seek employment elsewhere abroad. The researcher has recorded 15 resignations of agricultural engineers over the last three years alone, which makes up about one fourth of all engineers employed at the Department of Agriculture in 1978. Many more are hoping to leave. Not one vacant post has been added or substituted since 1976. On the next page is a photocopy of the letter circulated to all district offices of agriculture in which they are told to freeze all appointments, even of unskilled workers employed on a daily basis, as of September 4, 1981.

2. The morale of workers in the Department of Agriculture has further deteriorated by arbitrary sacking and transfer measures adopted by the Military Administration following the accession of Mr Begin into power in 1977. At least five senior technicians were dismissed in a gesture of exemplary toughness. Arab workers in the Department are repeatedly warned against unauthorized contacts with voluntary agencies or persons interested in extending aid or conducting research. This became clear when the directors of both the Cooperative Department in Hebron and Agricultural Research in Ramallah were dismissed, reportedly for their excessive contacts with American and British aid agencies.

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1. By inquiring with senior accountants at the Department, the researcher learnt that Israeli officials earn, relative to West Bank counterparts, 50% more in take-home salary, 100% more on mileage allowance, and 100% more on per diem allowance.

(A translated summary)

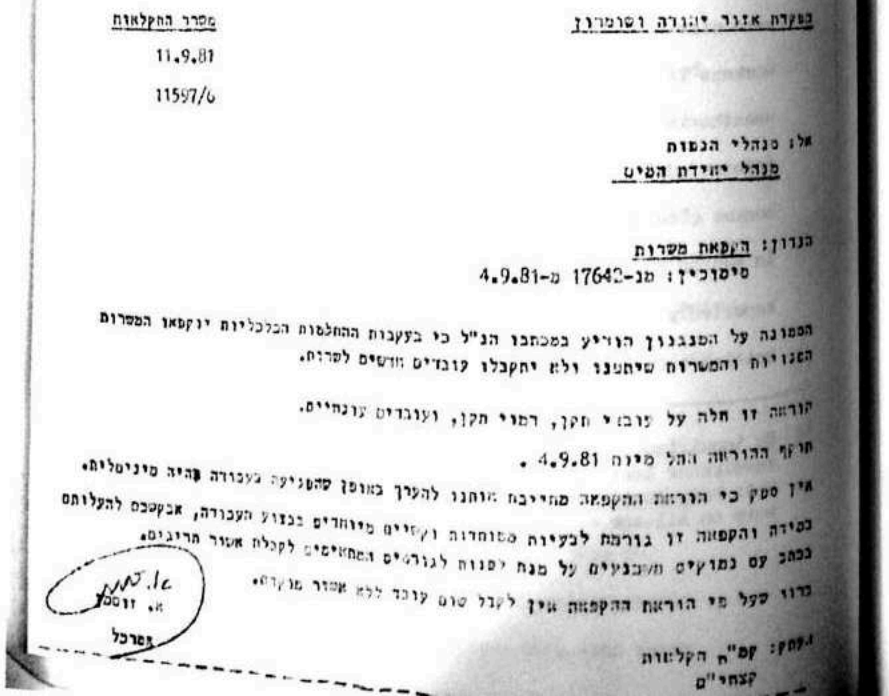
From: Chief of Staff in the Department of Agriculture.

To: Directors of Agriculture and Water Department.

Date: Sept 11, 1981.

We were advised by the Chief of Government Personnel Office that in view of recent economic measures, it was decided to freeze all new appointments, whether for currently vacant posts or others which may be vacated in the future. This order covers all kinds of employees, including those paid on a daily basis as well as seasonal workers. The decision is effective as of Sept 4, 1981.

We wish to rearrange ourselves in a way which minimizes damage. If there is an urgent need for a new post, please advise us so that we try to get a special approval.



3. The budget for agriculture was severely limited to just enough to cover salaries and fixed expenses. Its numerical value has stayed almost constant over the past three years, despite inflation rates of well over 100 percent. Unavoidably this has led to the almost total abolition of appropriations for promotional activities such as demonstration plots, exhibitions, field days, and educational leaflet distribution. By analyzing the budget for 1981 - 82 (see photocopy on next page), it is noticed that the allocations for "extension and training" amount to 0.5 percent of total budget, whereas salaries and administration account for 95.6 percent.

With such a static budget, extension staff are left with little to do, which in turn gives reasons to exercise further cuts in their numbers.

4. Extension and research technicians have been denied real training opportunities since the beginning of occupation. Jordan opted not to establish such contacts, presumably for fear of normalizing their relations with the occupation on a status quo basis. The Military Administration, on the other hand provided opportunities of in-service training only in Israeli institutions. The situation could have substantially improved following the revived interest of US AID and the British Council in supporting higher education programs in the West Bank. But the problem is that the Military Administration is often unwilling to let its Arab staff make use of these opportunities hence forcing some of them to resign for that purpose. Undoubtedly, the lack of adequate training opportunities has reflected badly on the professional level of extension

staff, and furthermore it has seriously undermined their morale and motivation for productive work.

5. The division of power in the hierarchy of the Department is confused and affected by political factors. Directors of district offices (all Arabs) are accountable not only to the Officer-in-Charge at the Military Headquarters, but also to local Military Governors. Decisions on proposed projects and activities are scrutinized with Israel's political and economic policies. To make things more difficult for directors of district offices, Israeli advisers are authorized to take part in all administrative and technical decisions, often in much more than an advisory capacity.

An administrative machinery like that described above for the West Bank Department of Agriculture is not only professionally emasculated but also vulnerable to corruption. The implications of that unhealthy situation on the prospects of reactivating agricultural development in the West Bank are obviously grave and render this assignment increasingly difficult. The development of agriculture can be difficult enough when fostered by a paternal national authority. But, such an assignement is rendered immensely more difficult when it has to be achieved in the face of an occupation force which has little or no interest in seeing agriculture help people adhere to their land.

Department of Agriculture

A summary of budget for 1981/82

1. Headquarters and district offices	Shekels (millions)	Jordan Dinars* (thousands)
Salaries for Israelis and locals	19.670	393.4
Research stations and forestry	0.860	17.2
Veterinary services and materials	1.440	28.8
Extension and training	0.150	3.0
Maintenance of machinery	0.200	4.0
Agricultural fair	0.220	4.4
Less sales of produce	1.000	20.0
Less charges for veterinary services	0.616	12.3
Total	20.924	418.5
2. Administration		
Office expenses	0.220	4.4
Office rent and maintenance	0.510	10.2
Post and telephones	0.300	6.0
Transportation and car allowances	6.813	136.3
Total	7.843	156.9
Grand total	28.767	575.4

Source: Letter no 1/11601, dated Sept 14, 1981 - signed by Chief Staff in the Department of Agriculture at the Military Headquarters.

* Conversion was made at the average exchange of I.S. 50 per Dinar.

C - Agricultural cooperatives

The West Bank has a fairly long history of cooperatives. Several cooperatives were established in the thirties and forties, and by 1948 there were more than 42 registered cooperative societies in what came to be known as the West Bank.[1] The majority of these cooperatives were engaged mainly in providing seasonal loans to peasant farmers.

In 1952 the Government of Jordan decided to reactivate the cooperative movement as part of its effort to solve its acute economic problems, particularly in rural areas. Due to extreme poverty and scarcity of capital, the emphasis was placed on providing seasonal loans to needy farmers, mostly through rural credit cooperatives that were modelled after the German Raiffeissen credit societies.[2] In 1959 the Government established the Jordan Central Cooperative Union (JCCU) as an apex federation serving all its member cooperatives, mainly providing them with loans through its banking department. In 1963, and through a grant from the Ford Foundation, the Government and the JCCU established the Cooperative Institute as an educational centre of in-service training, serving all cooperative bodies in Jordan.[3] In 1964 a third major step was taken, namely, the establishing of the Cooperative Audit Union as the official auditor of all cooperatives. With that the cooperative movement in Jordan was prepared structurally for a vigorous development stage. But unfortunately, all developments came to an end in June 1967.

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1. A K Tayeh, The History of the Cooperative Movement in Jordan, (Amman: Cooperative Institute, 1969), p 2.
2. Ibid, pp 1-3.
3. Files of the Cooperative Institute. The researcher joined the said institute through 1966-71.

A review of pre-occupation cooperatives

Despite a fairly long history and active official and international support, the cooperative movement in Jordan achieved only a modest success. This can be ascertained through several yardsticks, most importantly, size of membership and scope of cooperative services. Table (IV-3) presents a statistical review of West Bank cooperatives as they were by the end of 1966.

Table (IV - 3)

A preview of West Bank cooperatives

(as on December 31, 1966)

Type	Number of coops	Number of members	Share capital (JD)	Loans to coops (JD)	Coop loans to members (JD)
Agriculture, total	176	8,951	102,050	333,804	457,283
Credit and thrift	143	6,431	44,244	21,738	342,051
Others	33	2,520	57,806	312,066	115,232
Non-agr, total	62	5,426	125,316	157,139	89,824
Housing	12	630	60,516	87,644	51,492
Consumer	10	1,278	7,203	518	195
Others	40	3,518	57,597	68,977	38,137
Total	238	14,377	227,566	490,943	

Source: M Arrafah et al, The Cooperative Movement in Jordan, (Amman Jordan Cooperative Organization, 1977) p 5.

The data in Table (IV-3) do not reveal an important feature of the West Bank cooperative movement, namely, that the vast majority of agricultural cooperatives in 1966 were inactive and awaiting official liquidation.[1] This includes more than 90 percent of credit cooperatives and a large proportion of other kinds of cooperatives.

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1. Tayeh, op cit, p 5.

It was clear that farmers viewed credit cooperatives as a source of easy loans and that their affiliation to their cooperatives did not go much beyond the mechanics of distributing the funds made available to their societies. Loans to members were usually distributed in cash, instead of in the form of production inputs or technical service. This helped raise bad debts and delinquency to very high rates compared to other sources of seasonal credit, such as suppliers of farming inputs.

Even if the figures on the number of cooperatives and membership are taken at their face value, it is still noted that the number of farmers who were members of cooperatives was relatively small, since it did not exceed 10 percent of all farmers.[1] Besides, the average size of loans advanced to members was only JD 51 per farmer (computed from Table IV-3), which was considerably smaller than the needs of farmers for seasonal credit.

All these indicators point to a modest performance, even by the standards of 1966. Other sources of agricultural credit were much more important in meeting development needs. The Agricultural Credit Corporation, for instance, had by June 1967 an outstanding volume of loans in the West Bank of about JD 1.7 million[2], which was about five times the amount of loans advanced to cooperatives. Agricultural companies, in fact, were far more instrumental in meeting credit needs of farmers, mainly in the form of deferred payment of farm supplies. The two poultry feedmills which were

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1. Ibid, p 5.

2. An interview with the Deputy Director General of the Agricultural Credit Corporation, September 15th, 1981.

in operation in 1966, for example, had by the end of 1966 outstanding credit sales of JD 0.3 million.[1]

A major source of problems faced by cooperatives prior to occupation was the Jordan government's police of exercising what might be described as paternal attitudes towards cooperatives. The government maintained the cooperative movement under its implicit control and had run it in the light of its own priorities and internal politics.[2] This seriously undermined the democratic nature of cooperatives and curtailed their proficiency.

Conversely, the record of Jordan's agricultural development through the middle sixties demonstrates clearly that it owes much more to individual initiatives and private firms than to formal cooperative societies and public institutions.

Post-occupation developments

The sudden onset of Israeli occupation had immediate and far-reaching consequences on West Bank cooperatives. The head office of the Jordan Cooperative Organization ordered a freeze on all activities of registered cooperatives, although it approved of the re-opening of its three branch offices in Hebron, Jerusalem and Nablus. Israeli authorities did not object specifically to that, but they made it clear that they wanted no real activity to take place.

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1. Personal interviews at Jordan Provimi and Feedina Feed Companies.

2. According to the Cooperative Law no 17 of 1956, the Director of Cooperatives in the Ministry of Social Affairs is the ultimate reference on all important decisions taken by cooperatives, irrespective of majority rulings. More recently, the cooperative movement has been integrated even more closely to the official bureaucracy by linking the Jordan Cooperative Organization directly with the Prime Minister's Office.

By the mid-1970s, the Israeli and Jordanian sides eased their embargo on cooperatives. Some new cooperatives were registered and a few others were revived. In its search for a leadership other than the PLO, the Military Administration discovered that cooperative activities could possibly play an important role in the future, especially if cooperatives were kept under their stringent control.

As for Jordan, it also started to funnel some grants and loans to a small number of cooperatives, mostly for housing purposes. By 1978 the total funds channelled from Jordan amounted only to JD 82 thousands distributed among 25 cooperatives.[1]

In the late seventies, three major developments emerged which helped to accelerate the activities of cooperatives. First, the formation of the Palestinian-Jordanian Joint Committee (PJJC) in the Baghdad Summit Conference of 1978. The said committee was entrusted with all efforts to bolster the "steadfastness" of Palestinian residents in the occupied territories. Second, a number of foreign voluntary agencies (mostly American) embarked on a relatively aggressive developmental effort. The PJJC and voluntary agencies envisaged a primary role for cooperatives in expediting their programs. Third, the Military Administration evidently reaffirmed its earlier belief that the reactivation of cooperatives - as long as it was done under its strict control - might offer Israel attractive political and economic gains. In addition to syphoning large amounts of money, most of which could end up in Israel, the Military Administration learnt that by

1. Adnan Obeidat, The Cooperative Movement in the West Bank - its Present and Future (Amman: The Jordan Cooperative Organization, 1979) p 6.

using its right to register new cooperatives or permit them to receive aid, it could give extra leverage to its internal tactics and politics. The ramifications of these variables will be evaluated later in this section.

In response to the revived interest in cooperatives, many new ones were registered and the West Bank in effect witnessed a surge of cooperative activity. By the end of 1980 there were 321 registered cooperatives. Table (IV-4) shows the vocational distribution of these cooperatives, their functional status (operational or frozen)[1] and date or registration relative to occupation.

Table (IV - 4)

West Bank cooperatives

(December 31, 1980)

	Number of cooperatives			Date of registration	
Type	Total	Functional	Frozen	Pre-occupation	Post-occupation
Total	321	131	190	220	101
Agricultural-total	202	42	160	177	25
Credit and thrift	142	1	141	141	1
Livestock	16	10	6	7	9
Olive presses	11	11	-	9	2
Multi-purpose	33	20	13	20	13
Non-agricultural	119	89	30	43	76

Source: Files of the Department of Cooperatives.

The above data point to important features in the present setting of West Bank cooperatives. It shows, for instance, that more than two thirds of all cooperatives are of an agricultural nature

1. Frozen cooperatives are those which have stopped functioning but are still officially registered, pending reactivation or legal liquidation.

and that only one fifth of agricultural cooperatives are functional - the rest are frozen. The number of cooperatives registered after occupation is 101, of which only 25 are agricultural, which indicates greater emphasis on non-agricultural cooperatives.

Evaluation of agricultural cooperatives

The performance of West Bank agricultural cooperatives is much more modest than might be indicated by previous data. A recent study has revealed that the number of active agricultural cooperatives is in fact 30 encompassing 4222 member farmers, and that the efficacy of their services is only minor in comparison with the tasks laid before them.[1]

Counting on 500 West Bank villages and some 35000 workers employed in farming, agricultural cooperatives cover less than 7 percent of all villages and reach 9 percent of agricultural workers. The total number of full-time workers employed in this kind of cooperatives was 79.[2] According to available data on the finance of 22 active cooperatives, their average share capital was JD 9264, ie. JD 76 per member farmer.[3] In general, the Oxfam study portrays a poor picture for the West Bank's agricultural cooperatives and demonstrates that their role in developing agriculture is limited at the present.

The modest performance of agricultural cooperatives is the outcome of several complex variables, some of which are incidental, and others are more deep-rooted. Many researchers on the cooperative

1. N Khraisheh and Jon Ebersole, West Bank Agriculture Cooperatives, (Jerusalem: a study sponsored by Oxfam, 1980) p 13.
2. Ibid, p 27.
3. Derived from the same source.

movement in Jordan, including the present researcher, have come to the conclusion that group work is not necessarily favourable nor a particularly successful activity in local communities in the West Bank. Rural folklore, as manifested for example in proverbs and literature, casts suspicions on group work, while on the other hand it explicitly favours individualistic approaches to solving problems. This conviction is further accentuated by the frequent failures in cooperatives, which are caused mostly by conventional problems of poor management, shortage of finance, and governmental interferance. It was not surprising therefore to notice that the record of cooperatives prior to occupation contained far more failures than successes. In contrast, private initiatives in agriculture (and in other lines of business) were far more successful.

The onset of occupation gave cooperatives a distinctive comparative advantage, in that cooperatives became the most practical option available to governments and organizations interested in reviving the local productive base in the occupied territories. Alternative options, which usually exist in a sovereign state, have simply become inaccessible. On the other hand, occupation has generated a new set of problems which are still more serious and less manageable than cooperatives had to cope with prior to occupation. The crux of the new situation is that cooperatives, and ironically in compliance with Jordanian rules, are subject to thorough official control. By regarding itself as the legitimate heir of the Government of Jordan, the Military Administration has been keen on exercising its "inherited" rights to their limit. Furthermore, West Bank cooperatives have also to cope with other kinds of

problems arising from their inevitable connections with Jordan (see problem No 2 below).

The afore-described dual affiliation of West Bank cooperatives has precipitated many problems and constraints which are summarized as follows.

1. Very slow and noticeably selective registration of new cooperatives. New applications remain "under consideration" in the Department of Cooperatives and Labour (at the Military Headquarters) for 1-3 years.[1] In the meantime, the Military Government tries to gain much desired leverage in pursuing its policies. Applications presented by "moderate" farmers are approved and openly promoted.[2] The implicit aim appears to be to cultivate a new cadre of leaders whom Israel would eventually recognize as the legitimate representatives of the Palestinians in the occupied territories, in lieu of the Palestine Liberation Organization.

Another factor which Israeli authorities consider in evaluating new applications is their potential impact on the Israeli economy. Cooperatives which would help producers compete with their Israeli counterparts or enhance the local production base are not welcomed,[3] whereas those which either augment Israel's economy or merely raise the standard of living of their members are generally considered.

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1. Interview with the Director of Cooperatives in Nablus district, July 5, 1981.
2. In 1981 the Military Administration dismissed the Director of Cooperatives in Hebron district and replaced him with the brother of Mustafa Dodeen, the leader of the "village leagues".
3. For example, poultry farmers and cooperatives are discouraged in various ways, mainly by having to compete with subsidized Israeli produce, whereas a strawberry cooperative in Gaza is strongly supported because it sells all its produce to Israeli firms.

2. Lengthy registration procedures of new cooperatives by the Jordan Cooperative Organization (JCO) in Amman. This step is demanded by the government of Jordan and the Joint Committee as a pre-requisite for providing any assistance to a new cooperative. Obviously, this entails additional complications and loopholes which put the ordinary farmer(s) at a clear disadvantage. Registration in Amman is easier and more accessable to certain types of leaders who, in many cases, are equally favoured by the Israeli authorities.

3. Strict and selective control of finance. The Military Administration has issued repeated instructions forbidding any cooperative (or municipal authority) from receiving funds from any source without procuring its prior approval.[1] This has proved to be the most formidable obstacle in the effort to promote existing cooperatives. Approvals are very slow to come, if at all and the whole process is judged, in the final analysis, by its impact on Israel's own interests. With the increasing dependence of cooperatives and municipal authorities on foreign funds (mostly from the Joint Committee), the Israeli authorities have developed a new and very effective tactic which they can manipulate at will.

In August 1981, for example, the new Begin government decided to exert further pressure on municipal councils and cooperative societies by imposing a total ban on the flow of funds from the Joint Committee. Based on previous experiences, it is likely that this ban will be selectively relaxed in the future.

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1. The researcher read several letters in that connection which were received by district cooperative offices from the Officer-in-Charge of Cooperatives at Beit Eil (Military Headquarters).

Even in the event that cooperatives are permitted to receive "foreign" aid, the actual disbursement of funds received in still subject to last-minute approvals.[1] Each cooperative has to provide extensive details to Officers-in-Charge in the Military Headquarters, just to make sure that everything is in accord with Israeli policies.

4. Inadequate service infrastructures. The status of auxiliary cooperative infrastructures deteriorated sharply after occupation. The services of education, training, research, and auditing all came to an end due to a sealing off of the West Bank for the services rendered by the Cooperative Institute and the Audit Union, which both have their headquarters in Amman. The number of staff employed at West Bank branches of the Jordan Central Cooperative Union declined from 22 on the eve of occupation to 10 in early 1981. Cooperative staff have been denied training opportunities, which has caused further worsening in their morale. With such a low level of auxiliary services, the mediocre performance of cooperatives is not unexpected.

Development guidelines

Agricultural cooperatives have not assumed a primary role in West Bank agriculture, before or after Israeli occupation. Their role in accelerating agricultural development while the West Bank is still under occupation is untypically complex and involves diametrically opposed interests. Despite important reservations arising from Israel's control of all cooperative activities, those parties interested in assisting Palestinians under occupation cannot

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1. Jenin Agricultural Cooperative, for example, failed to collect any of the JD 160,000 it was granted by the Joint Committee, because it failed to have its projects approved by the Military Administration.

overlook the fact that cooperatives are among the very few channels available for funelling aid. This, therefore, entails three fundamental guidelines in their dealings with cooperatives, namely the following:

1. Providing all possible assistance to existing cooperatives, but with attention to the political ramifications of their activities.

2. Improving the efficiency of cooperatives and auxiliary infrastructures through a concerted effort bearing on existing constraints, most importantly by upgrading the calibre of management in the major marketing cooperatives.

3. Searching for alternatives, other than cooperatives, as means of implementing development plans. Foremost, this might include direct dealing with individual farmers or small groups of farmers.

These general proposals will be elaborated in more practical terms in the chapters which discuss about development measures.

D - Voluntary agencies

Being the focus of intensive international interest for such a long time, and because of their transitionary status under Israeli occupation, the West Bank and Gaza Strip have witnessed during the last decade a marked surge in the number and scope of activities of what are described as voluntary agencies (VA's). The number of these agencies at the present is about 17, but those engaged in rural development in various forms are just six, namely:

1. Mennonite Central Committee (MCC)
2. American Near East Refugees Aid (ANERA)
3. Community Development Foundation (CDF)
4. Catholic Relief Service (CRS)
5. International Churches Committee (ICC)
6. CARE

Each of these agencies has its own objectives, sources of finance, and terms of operation. All of them were surveyed individually through an in depth study conducted by the researcher during the course of this work. This section, however, includes only some general remarks regarding their current activities on the West Bank and guidelines for the role they might play in developing West Bank agriculture.

a. Size of aid funds

Although they tend to earmark fairly "large" sums of aid in their opening budgets, a striking observation in this regard is that the actual amount of aid extended by voluntary agencies is small. Several years after they commenced their operations, the combined volune of aid the VA's advance has not yet exceeded 3 million dollars a year,[1] covering both the West Bank and Gaza Strip.

This is a negligible sum when compared to the thousands of millions of dollars going into countries which have been much less hurt by the chronic Arab-Israeli conflict, notably, Israel and Jordan.

1. This estimate was assessed through interviews with the staff of all major agencies.

As far as their activities in the agricultural sector are concerned, ANERA is the largest donor, followed respectively by CDF, MCC, CARE, CRS and ICC.

All aid advanced by voluntary agencies is in the form of grants which are usually balanced by funds from recipients themselves. Grants advanced by VA's have often been critically important for initiating projects and carrying them to completion.

b. Source of funds

ANERA and CDF derive more than 70 percent of their funds (CDF all of it) from US AID, which is an integral organ of the US State Department. The rest of the voluntary agencies receive their funds from a variety of religious and philanthropic organizations, not excluding the possibility of link-up with US AID or other political entities.

c. Objectives

ANERA restricts its services mainly to agriculture and it deals with cooperative societies and public institutions (eg. municipalities and universities). CDF is more concerned with health and drinking water projects and it also tries to keep its contacts with individual farmers to a minimum. The rest of the VA's have a wider range of activities, though on a smaller scale, and they do not have over-riding restrictions against contacts with individual farmers.

The undue emphasis on cooperative societies has not only channelled aid to institutions with a chronically low efficiency, but it has also left out an extensive spectrum of individuals and groups who may be as needy yet more efficient users of aid.

It is true that aid to individual beneficieries involves higher over-head expenses and meticulous attendance to details, but in a country where private initiatives currently constitute the corner-stone of agricultural and economic development, the extra cost is certainly justified.

Cooperation among voluntary agencies is effected through frequent meetings of their senior officials. But still there is obvious overlapping and occasional conflict in their lines of activity, more so in that they have different affiliations and because most of them are doing a little in many directions.

d. Relations with Israel

Despite their philanthropic identity voluntary agencies face close supervision and even harrassment by Israeli authorities. They all have to submit their proposed projects long in advance and wait long periods for approval. Here lies the crux of the confrontation between most VA's and the Military Administration, for they have sharply different perceptions of development priorities.

Israel would like to see the bulk of aid go to improving living conditions in refugee camps and rural communities, but without introducing important changes in their production base, unless that conforms with Israel's own economic strategies in the occupied territories.[1] Furthermore, the Military Administration

1. The researcher read a letter sent to the director of ANERA from the Ministry of Defence in which they told him that they knew the needs of local residents better than he did. Then they list for him a wide range of welfare projects which they would like to see him assist. None of the listed projects had anything to do with agriculture or production activities.

is anxious to exploit economic aid in gaining political leverage by channelling aid to the "right" people.[1] This is strongly resisted by most agencies.

Project proposals which do not meet Israeli favour are often shelved and later rejected. This often triggers a tedious process of bargaining and lobbying involving local and foreign media, as well as senior political echelons. Usually this results in more approvals by the Israeli authorities, but sometimes not without corresponding concessions. A balance sheet of Israel's initial reaction to proposed projects is presented in Table (IV-5) which shows, though not quite typical of all VA's, that of 19 projects submitted by ANERA for 1979, only 9 were cleared, 3 are still pending, and 7 were rejected. The researcher was told furthermore, that it took two years of lobbying to have the nine projects cleared.

Slow processing of project proposals entails important difficulties for both sponsoring agencies and recipient organizations. Agencies which rely heavily on US AID for finance find it increasingly embarrassing to ask for more funds when they are unable to dispose of outstanding allocations. In contrast

1. The Israeli Government is trying now to channel all VA financial support through those "leaders" who are willing to join autonomy talks promoted by Camp David (US, Egypt, Israel). For that purpose, they have created what they call "villages leagues" which they like to see replace the PLO and local municipal councils as representatives of local communities. By 1982 five such leagues were established and their members were even armed by the authorities.

Table (IV - 5)

ANERA'S Project proposals for Fiscal Year 1979, and official response by February 1982.

	Project Title	Amount of aid US $	Official response
1.	Halhul Agriculture Cooperative's Agricultural Services Project	150,000	Rejected
2.	Dura Agriculture Cooperative's Agricultural Services Project	150,000	Suspended
3.	Nablus Region Agriculture Cooperative's Agricultural Services Project	250,000	Approved
4.	Hebron District Mechanized Agricultural Services Cooperatives Project	100,000	Approved
5.	Ein Simya (Ramallah District) Olives Press Cooperative's Oil Grading, Quality Control and Tinning/Bottling for Export Project	150,000	Approved
6.	Jenin Regional Marketing Cooperative	150,000	Suspended
7.	Jericho Marketing Cooperative's Vegetable Seedling Nursery Project	100,000	Rejected
8.	Hebron/Bethlehem Cooperative Plant Nursery Project	150,000	Approved
9.	Hebron District Union of Village Electrification Cooperatives' Electrification for Light Industry Project	250,000	Approved
10.	Nablus Region Village Electrification Cooperative "Union" Electrification for Light Industry Project	250,000	Rejected
11.	Dura Municipal Electrification for light industries project.	100,000	Rejected
12.	Gaza Municipal Rainwater Conservation Project	250,000	Approved
13.	Gaza Municipal Self-Help Neighbourhood Project	100,000	Approved
14.	Jalazone Bakery Cooperative Project	45,000	Suspended
15.	Tarqumia Cooperative Revolving Fund for Land Reclamation	100,000	Approved
16.	Nablus Regional Agricultural Cooperative's Revolving Loan Fund for Land Reclamation Project	100,000	Rejected
17.	Ramallah Municipal Vocational Training Institute Project	125,000	Rejected
18.	Hebron University Graduates' Union Polytechnic Project	125,000	Approved
19.	Hebron Patients' Friend Society District Hospital Project	300,000	Rejected

Source: ANERA'S office in East Jerusalem.

they are constantly battling against proposed cuts in their funds. Besides, the prices of goods are liable to so much drastic and rapid changes that previous cost estimates and feasibility analyses may become inapplicable and require a costly and time-consuming revision. In some cases, it is even possible that the underlying political, economic and social setting may change during the lengthy processing period, so much so that the validity of the whole project may become in question.

e. Political remifications

Undoubtedly, the functioning of voluntary agencies is underlied by complex political motives, more clearly so that most of them are openly affiliated to the US State Department.

Successive American governments have sustained intense interest in West Bank politics since the beginning of Israeli occupation. Although American presidents have been only a little reserved in their support of Israel, the State Department, on the other hand, has always been keen on cultivating a stronger foothold among residents of the occupied territories. The Department's objective is, clearly enough, to develop a maximum local leverage as a potential investment in future politics. If and when the time comes, and a Palestinian state is established, the United States is anxious to be able to influence it. To achieve that purpose, American policy has taken several concrete steps. At the political level there have been frequent "private" signals suggesting implicit support for establishing a Palestinian state. This was openly expressed in such reports as that of Brookings Institution team (headed by the

then Professor Z Breszinski) and by several similar studies prepared by the American Enterprise Institute.[1] In fact there was a time (most explicitly 1973-76) when the American Consulate in East Jerusalem was actively assessing the infrastructural needs of a forthcoming Palestinian state.

But following Begin's accession to power in 1977 and the signing of Camp David Accords, American interest in this regard has faded and it now takes forms which are less concomittant with Palestinian aspirations.

To achieve a stronger foothold in the area the United States has also resorted to its conventional policy of advancing "aid". While it was not possible to establish direct relations with an official Palestinian authority, US AID tried to achieve that through indirect means, such as voluntary agencies. It is clear therefore that the surge of American voluntary agencies in the occupied territories is not motivated merely by benevolence. More likely, VA's are perceived as important links with local Palestinian leaders, most of whom are strongly connected with the PLO.

While the political and economic limitations of voluntary agencies are common knowledge among informed West Bankers, the dominant attitude among public leaders is that they could not make matters worse under an Israeli occupation, especially in the absence of more plausible alternatives. This probably

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1. Emile Nakhleh, The West Bank and Gaza - Toward the Making of a Palestinian State, (Washington D.C. : American Enterprise Institute, 1979).

explains the rapport which has evolved between VA's and divergent local political entities, ranging from pro-Jordan traditional leaders and to pro-PLO municipal councils.

f. Effectiveness of advanced aid and current prospects

The impact of aid advanced by voluntary agencies in the occupied territories is, in the researcher's experience, out of proportion to their size. Besides having able management teams, the higher efficiency of advanced funds is due mainly to the lack of alternative sources of investment which are otherwise available in countries under their own national rule. Even after the "Arab" money started pouring in, VA's continued to enjoy the distinctive advantage of being able to reach individual farmers and small beneficieries who are virtually inaccessible to the Palestinian-Jordanian Joint Committee (PJJC) operating from Amman.

The presence of qualified technicians on their staff has enabled VA's to evaluate the feasibility of proposed projects and provide them with limited supervision during the course of their implementation. Furthermore, voluntary agencies enjoy the advantage of legitimacy by the Israeli government, in contrast to the more sticky legal status of PJJC funds. In conclusion, the researcher believes that voluntary agencies could have an important role to play in the occupied territories, at least until a national authority takes over. This, however, should be done with sufficient awareness of the salient political ramifications of their activities.

B. Agricultural finance

Sources of agricultural finance prior to occupation had gradually differentiated into several institutions with defined frames of reference. Medium and long term credit needs were handled by the Agricultural Credit Corporation (ACC) through its regional branch offices. The ACC was receptive of all applications for developmental purposes at the subsidized interest of 6 percent, but only against a security of real estate mortgage. Production loans for seasonal purposes were not available at the ACC since that assignment was delegated instead to the Jordan Central Cooperative Union (JCCU) through its member cooperatives which, in turn, advanced loans to their members only (around 10 percent of total farmers) at an interest of 9 percent.

Seasonal lending was undertaken on a more effective scale, though mostly in kind, by dealers of farm supplies and middlemen (see Table IV-6). The role of usurers, on the other hand, was more significant in the East Bank of Jordan than in the West Bank, where usury occupied a minor role as a source of credit for farming purposes.

Table (IV - 6)

Sources of agricultural finance in Jordan

	JD mill	% of total
Agriculture Credit Corporation	6.0	57.1
Commercial banks	0.7	6.7
Cooperative Societies	0.5	4.8
Middlemen and dealers of farm supplies	1.0	9.5
Userers	2.0	19.0
Others .	0.3	2.9
Total	10.5	100.0

Source: F Fanek, The Agricultural Sector of Jordan (Amman: Jordan's Central Bank, 1970) p 48.

The West Bank had in May 1967 four branches of the ACC and three others of the JCCU. The volume of outstanding loans advanced by both institutions in the West Bank was estimated at JD 2.1 mill,[1] 66 percent of which was advanced by the ACC and 34 percent by the JCC. Although there is no quantitative evidence on the magnitude of credit facilities advanced by private firms and commission agents, their role has certainly been critical in meeting short-term credit needs. It is reasonable to conclude that West Bank farmers were availed with a fairly integrated and reasonably adequate package of credit services, which helped them achieve a fairly rapid expansion in many farming sectors, mainly in poultry, citrus, and irrigated agriculture.

The situation regarding agricultural finance changed sharply in the wake of Israeli occupation in June 1967. The Government of Jordan closed down all West Bank ACC branches and refused to permit lending operations to West Bank farmers by East Bank branches. Although JCCU branches were permitted by Amman to reopen, they were nevertheless instructed to freeze all credit activities. Commercial banks followed suit and they also temporarily closed down all their West Bank branches. Furthermore, the Jordanian Government instructed all banks to freeze current deposits of West Bankers, for fear of massive withdrawals. This measure was relaxed later but at a very slow pace and over a number of years.

During the early years of occupation Jordan initiated a program of financial support to selected West Bank institutions and individuals, presumably in an effort to bolster their "steadfastness". Although large sums were reportedly channelled for that purpose, this project appears to have proved a failure, probably due to corrupt management and political favouritism.

1. Sources for JCCU and ACC volume of outstanding loans in the West Bank were cited earlier (page 141-2).

The Military Administration, on its side, tried during the early years of occupation to promote its own agricultural credit program. Loans for purposes set by the Department of Agriculture were advanced to "eligible" borrowers at concessional terms, but then only after the approval of the regional military governor. It then became clear that government lending was intended to give the Military Administration extra leverage in negotiating with local leaders. This was enough to convince an inherently suspicious rural community to keep away from Israeli loans, and even attach to such signals of "benovalence" a strong stigma.

The money market tightened considerably in the seventies and moved deeper into recession and rapid inflation. This motivated dealers of farm supplies and other private lenders to cut down drastically on their credit operation, for fear of substantial losses generated by the rapid devaluation of Israeli currency. With that source of credit shut off, West Bank farmers were deprived for many years of almost all institutional and private forms of credit. They even displayed a marked reticence to invest their own savings beyond imperative needs, mainly because of low profitability and insecurity.[1] By the late seventies it was clear that the constriction of agricultural finance had become one of the most important reasons for the retarded growth of West Bank agriculture.

The deadlock in agricultural finance started to loosen gradually after 1977. This came in response to the emergence of foreign voluntary agencies and the formation of the Palestinian-Jordanian Joint Committee as a credit institution specialized in channelling

1. According to Michael Mazur, low profitability of agricultural projects was more important in impeding investments in Jordan's agriculture than the common claim of insufficiency of credit supply - see Mazur, op cit, p 189.

aid to residents of the occupied territories. Both of these developments were evaluated separately.

Conclusions

The following is a summary of the conclusions which can be drawn in the light of the foregoing discussion on supportive institutions.

Education

1. Pre-college and higher education systems are academically oriented and they have proved of little relevance to the development needs of the West Bank itself. In contrast, the educational system has been more sensitive to the needs of neighbouring countries, and has initiated a sustained exodus of intellectuals during the past three decades.

2. The role of the Khadourie and A'rroub Agricultural Institutes in facilitating agricultural development in the West Bank is limited, and it has become even more so under Israeli occupation.

3. Likewise, the role of agricultural college graduates in developing West Bank agriculture has been also insignificant. This is due mainly to their excessively academic background and the lack of pre-service training opportunities.

Agricultural extension and research

1. Extension services have been severely reduced, whether through cuts in staff or working budget. By 1981, extension offices were concerned very largely with sectors serving Israeli exporters.

2. Planning of agriculture is effected by the Military Command and priority is given to protect and enhance the economic and political interests of Israel itself.

3. Research activities on local stations have been limited and assignments delegated instead to Israeli research stations.

Cooperatives

1. Agricultural cooperatives failed to play an active role prior to occupation, mainly due to inefficiency and ineffective government policies. But in addition to that there seems an intrinsic reticence among rural communities in the West Bank to engage in group work.

2. Cooperatives during the post-occupation era were confronted with complex problems which resulted in a minimizing of their role in accelerating agricultural development. These included strict and comprehensive control measures enforced by the Military Administration. More recently, Israeli authorities have begun to conceive of cooperatives as a potential power, which might eventually play a political role substituting that of the PLO. At the same time Israel displays little interest in seeing cooperatives help member farmers actually expand their production base.

3. Despite their externally-imposed political image and their inefficient record, cooperatives can and should play a more vigorous role in developing West Bank agriculture. This stems from the fact that cooperatives are among the few options open to channel financial aid and technical assistance to farmers under Israeli occupation.

Voluntary agencies

1. Most voluntary agencies operating on the West Bank are affiliated in various ways to sectors of the US Government. It appears though that they are entrusted with the assignment of trying to balance the pro-Israel policies practiced by the US Administration as a whole.

2. Voluntary agencies have managed to play a positive role in solving problems encountered by village communities. But the magnitude of their services is relatively small, due to inadequate budget appropriations and the hostile attitude of the Military Administration.

3. Within the present unusual setting where aid institutions cannot deal with the occupied territories through conventional institutions and channels, voluntary agencies have not only proved useful but they have opened new opportunities for Arab and international sources of finance.

Agricultural finance

1. Institutional sources of credit closed down immediately after occupation. Coupled with low profitability and high risk margins, this resulted in a marked decline in the rate of investment in agriculture.

2. Although several sources have more recently started to provide sizeable forms of aid to the West Bank, donor agencies have failed so far to meet the needs of individual farmers or small rural communities. Most donors were attracted instead to institutional bodies (eg. cooperatives) which were not greatly significant in relation to the credit needs of individual farmers.

CHAPTER V

CHAPTERS V

THE ECONOMY

Chapters III and IV have covered aspects of conflict relating to major resources and also supportive institutions facilitating agricultural development. This chapter extends these considerations of specific aspects of conflict to discuss a more general assessment of the situation in terms of conventional economic criteria.

However, despite the enormous significance of economic transformation in the West Bank following occupation, this chapter cannot provide a comprehensive discussion on this subject. Economic issues dealing with the occupied territories need more intensive studies by specialized economists whereas the aim here is to provide an adequate context of the specific subject of this thesis.

The economy of the West Bank was already vulnerable to external factors prior to occupation, and this helped later facilitate a form of colonial exploitation by Israel. It is helpful therefore to begin this chapter with a review of the West Bank's economy as it was shortly before the Israeli occupation in 1976.

The state of economy prior to occupation

The West Bank emerged from the 1948 War in a state of some despair and chaos. In addition to a major military defeat, the West Bank's economy was greatly damaged following the arbitrary severance of its connections with the rest of Palestine, with which it had been intergrated.

The annexation of the West Bank to the Hashemite Kingdom of Jordan in 1950 then entailed new economic realities. The emerging country was

deficient in raw materials, water resources, cultivable land, credit facilities and basic infrastructures. Foreign aid, almost all from Britain and the United States, played a key role in freeing the country from total brankruptcy. Even then, aid was channelled primarily to the East Bank. It was only through foreign aid that Jordan managed to survive politically, and even succeeded later in achieving many transformations in its service institutions and economy. Contrary to low expectations expressed by the World Bank's mission to Jordan of 1956, the Gross National Product increased steadily at rates of over ten percent all through the fifties and early sixties.[1] Per capita income rose from $90 in 1950 to $200 in 1967.

The West Bank appears to have benefited to varying degrees from the high rates of growth in Jordan. It is very difficult to quantify changes in various sectors, as all published statistics until 1967 are presented on a unified basis covering both parts of Jordan. Table (V - I) shows a sectoral distribution of Gross Domestic Product as ascertained in an Israeli study conducted shortly after occupation, based mainly on Jordanian data.

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1. R. Porter, et al., The Economic Development of Jordan, (Baltimore: Johns Hopkins Press, 1957). This study was sponsored by the International Bank for Reconstruction and Development (the World Bank).

Table (V - 1)

West Bank Gross Domestic Product - 1965

Sector	Thousands of Dinars	Percent of total	Percent of national estimates
Total	54,501	100.01	36
Agriculture	12,998	23.9	38
Industry	3,576	6.6	26
Quarrying	646	1.2	26
Construction	3,147	5.8	40
Electricity & water	587	1.1	35
Transportation	3,229	5.9	26
Trade	12,574	23.1	40
Banking & Finance	844	1.5	40
Home ownership	4,276	7.8	40
Public service & security	7,496	13.7	35
Other services	5,132	9.4	40

Source: Economic Planning Authority, Economic Survey of the West Bank, (Jerusalem: Central Bureau of Statistics, 1967), 12pp (original in Hebrew).

The above figures indicate that the West Bank played an important role in Jordan's economy. Its contribution to most sectors was 35 to 40 percent. More importantly, it became the primary supplier of skilled labour and capital which were deployed in rapidly growing East Bank infrastructures. This resulted in massive migration of workers (and their families) to the East Bank, settling mostly in and around Amman.

East-bound migration of labour gained further momentum with the emergences of the Gulf oil countries in the early fifties. Large numbers of Palestinians from both sides of Jordan emigrated, first to

Kuwait and Saudi Arabia, and then to other emirates with newly discovered wealth.

Emigration of human resources from the West Bank signifies the most important feature in its socio-economic configuration during the Jordanian rule. Emigrants started to send sizeable remittances to their relatives at home, who used the money in improving their low standards of living and in constructing new houses. Remittances from emigrants had, in fact, become an important factor in the relative prosperity which prevailed in both parts of Jordan during the early sixties.

Emigration, on the other hand, precipitated negative repercussions of a different nature. It gravely undermined more efficient exploitation of resources, created an emasculated political entity, and brought about serious demographic weaknesses relative to the Arab-Israeli conflict. So when the West Bank changed hands in 1967, the occupying authority had relatively little difficulty in exerting control.

Post-occupation developments

During the few weeks following its sudden victory in June 1967, Israel's economic policies in the occupied territories were basically of a remedial nature. But having discovered the extensive opportunities generated by its military victories, Israel appeared to formulate a comprehensive economic policy which, as now suggested by considerable evidence, has been guided by the following permises:

1. Permitting, and later encouraging, residents from the occupied territories to join Israel's labour market.

2. Opening local markets in the territories to free entry of Israeli goods, but with the flow of goods from the territories into Israel

being extremely selective and liable to stringent regulations.

3. Permitting continued trade with Jordan through what is known as the "open-bridge policy" on the basis of maximizing exports but holding imports to a minimum.

4. Restructuring of the money market and fiscal policy by permitting two currencies in circulation and by closing down all Arab banks and credit institutions.

5. Claiming property of all state land and all private plots whose owners do not possess formal deeds issued by land registration offices.

6. Restricting water use by Arab residents to approximately 20 percent of all usable reserves, and leaving the rest to be gradually developed by Israeli beneficiaries.

The Israeli policies related to land and water were discussed earlier in chapter III and this chapter now deals with other more general economic sectors and parameters of economic growth.

Aggregate growth

The West Bank economy has achieved a high rate of growth since 1967. The assessment of this growth is hampered by several problems such as unreliability of data, exclusion of East Jerusalem from West Bank statistics, and the difficulty of discounting accurately for rapidly rising prices. The problem is further compounded by taking the two years succeeding occupation as a baseline for measuring subsequent growth, which inevitably leads to unduly optimistic comparisons.

Despite all the above mentioned limitations, empirical and statistical evidence suggests that both gross domestic product and gross national product have risen at fairly high rates, though exact figures of growth

remain highly controversial. According to official data, West Bank GDP is reported to have risen at the rate of 12 percent per annum during 1968-75 (at 1968 prices). In the late seventies, however, GDP growth declined to the more modest rate of 7 percent. Likewise, GNP reportedly rose (at 1968 prices) at the annual rate of 10 percent in the early years of occupation and then at 7 percent in the late seventies.[1]

The official figures on rates of growth are believed to be biased upwards by most independent economists. In his study on the economy of the West Bank and Gaza Strip, Arkadie calculated the growth rate during 1968-73, over and above postwar recovery, at about 9% per annum. By applying his adjustment formulas for the subsequent period of 1975-80, the growth rate during this period drops to some 4-5%. Evidently, these figures are not remarkably high compared with the pre-1976 growth rate of about 8% or that of Jordan during 1970-75, estimated at about 6%,[2] nor are they higher than growth rates in most non-oil producing countries of the Middle East. (See Table V-2)

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1 B.V. Arkadie, op. cit., p. 119.

2 Jordan's Five Year plan for Economic Development 1976-80, (Amman: Jordan Development Board), pp.9, 11.

Table (V - 2)

Rates of GNP and GDP growth in certain countries of the Middle East

Average annual growth (1960-78)

	GNP (%)	GDP (%)
Egypt	3.3	7.8
Iraq	4.1	n.a.
Jordan	n.a.	7.0
Syria	3.8	9.6
Tunisia	4.8	7.9
Israel	4.2	4.5

n.a. = not available

Source: World Development Report (Washington, D.C.: The World Bank, August 1980) pp. 110-112

Private consumption

Private consuption rose at about 6-7% per capita during the early years of occupation[1] and then at about 4% in the latter seventies.[2] Increased consumption was fuelled by a tangible rise in gross income per capita, estimated for 1979 at IL29,589 (around £1100).[3]

1 S.V. Arkadie, op. cit., p.119

2 Administered Territories Statistics Quarterly 1980 op. cit., p. 79.

3 Ibid., p. 63.

Table (V - 3) presents a comparison of income per capita for a number of countries in the Middle East.

Table (V - 3)

GNP per capita in selected countries (1978)

	GNP/capita U.S. $		GNP/capita U.S. $
Egypt	390	Kuwait	14,890
Iraq	1860	Saudi Arabia	7,690
Jordan	1050	United Kingdom	5,030
Syria	930	Germany (Fed Rep.)	9,580
Tunisia	950	United States	9,590
Israel	3500	U.S.S.R.	3,700
West Bank	(1100)	Germany (GDR)	5,710

Source: World Development Report, op. cit., pp. 110-111.

Although per capita income and rates of consumption growth may be biased upward as they are reported in official data, there is no doubt that the standard of living has indeed substantially improved. This is clearly exemplified through such vital indicators as dietary intake and ownership of important household amenities.

The dietary balance sheet of the West Bank shows a marked improvement during the period 1970-80 (see Table V - 4). While it is true that problems of under-nutrition have declined to a very low level, there are still problems of a qualitative nature. A prominent example is the relatively low intake of animal proteins caused by a sharp rise in the prices of meat, fish, and eggs.

Table (V - 4)

Dietary levels in the West Bank and Israel

Daily food intake	West Bank		Israel	
	1970	1979	1979	West Bank ratio to Israel (%)
Energy - calories	2550	2833	3039	93
Total protein-grams	75.2	81.2	96.4	84
Animal protein - grams	17.1	21.1	50.3	42
Fat - grams	61.4	70.8	113.5	62

Source: (1) Statistical Abstract of Israel 1980, op. cit., p. 687, 278.

(2) Statistical Abstract of Israel 1972, op. cit., p. 655.

A similar rise has also been witnessed in the ownership of major household amenities. In addition to higher income, this has been further facilitated by the extensive dissemination of electric power produced by small generators. Table (V - 5) shows that the rise in household amenities has covered rural and urban communities alike, though a considerable gap still exists between the two.

Table (V - 5)

Households possessing certain amenities

(percent of all households)

	Villages		Towns	
	1972	1979	1972	1979
Electrical or gas stove	3.2*	11.3	22.5*	35.2
Electrical refrigerator	3.4	22.7	40.7	83.5
Washing machine	2.6*	5.9	41.0*	58.5
T.V. set	2.5	33.7	28.7	77.8

* For 1974.

Source: Statistical Abstract of Israel 1980, op. cit, p.689

The impact of the rising standard of living on the economic relations between the West Bank and Israel seems to indicate a kind of colonial cycle. Remittances of workers employed in Israel and imports of goods and services from there account respectively for about 25% and 60% of West Bank's GNP. But as more than 90 percent of imports are procurred from Israel, West Bankers syphon back to Israel all their wage earnings, and probably much more. Obviously, such "affluence" is precarious and does little to serve the long term interests of the West Bank itself.

Expenditure, saving, and investment

Private consumption continued to rise, though with considerable fluctuations, all through the seventies. This was utilized largely for supporting a steadily improving standard of living, rather than for capital formation purposes. In fact investments on the average remained steady, despite alternate erratic fluctuations (see Table V - 6). Total investment in fixed assets, including dwellings, averaged at 14-15% of total resources, as compared with a rate of around 20% in Israel.[1]

Likewise, the rate of saving declined in recent years until it reached a low of 13% in 1979,[2] which again indicates a growing trend towards a consumer economy in which saving and investment are kept to a minimum. Surplus capital, as we shall see later, has in fact been consistently channelled out of the country for investment in Jordan, where rates of return are higher and government policies are much more favourable.

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1 Arie Bregman, The Economy of the Administered Areas 1974-75 (Jerusalem: Research Department in the Bank of Israel, 1976) p. 17.

2 Derived from the Statistical Abstract of Israel 1980, op. cit., p. 683.

Table (V - 6)

Uses of resources (at 1968 prices)

	IL mill.	Percent annual change				
	1974	1975	1976	1977	1978	1979
Private consumption	696	7	10	2	4	8
Government consumption expenditure	77	-1	3	1	-	6
Gross investment	222	-27	28	-	37	-10
Exports of goods and services.	203	22	14	-8	32	-6

Source: Statistical Abstract of Israel 1980, op. cit, p. 680.

Public sector real operating expenditure constitutes about 5% of usable resources, as compared with 19% in Israel[1] and 20% in Jordan.[2] In fact public spending has come to a virtual standstill ever since the early seventies when Israel plunged deeper into severe recession and high spiral inflation rates. A comparison of per capita public spending and total investment in the West Bank, Israel and Jordan indicates a drastic lag for the former in both criteria (see Table V - 7). This illustrates a very important feature of Israel's economic policies in the occupied territories, namely, maintenance of public services there at bare subsistence and avoidance of significant improvements in productive infrastructures.

1 Statistical Abstract of Israel 1980, op. cit., p. 161.

2 Annual Report of Jordan's Central Bank (Amman: Central Bank, 1979) p. 8.

Table (V - 7)

Per capita public expenditure and total investment

(in Pound Sterlings)

	Public expenditure	Public and private investment
West Bank (1971)	13	14
Israel (1971)	264	274
Jordan (1966)	53	38
Jordan (1971)	81	66

Source: Elizabeth Collard and R. Wilson, op. cit., p. 4 in a reprint of the study.

Sectoral Analysis

Sectoral analysis of the West Bank domestic and national product is detailed in Table (V - 8). It is clear from available data that the gross domestic product consists of two major sectors namely, agriculture and business services, each contributing around one third of GDP, followed by construction (15%) public services (11%) and industry (6%).

Table (V - 8)

Gross national product, by economic branch

	1978		1979		Av. 78/79
	IL mill.	% of GDP	IL mill.	% of GDP	% pf GNP
Agriculture - including subsidies	4,722	31.2	3,222	36.2	25.1
Industry	893	5.9	539	6.0	4.5
Construction	2,336	15.5	1,225	13.7	11.2
Public and community services	1,680	11.1	1,004	11.3	8.5
Transport, trade, other services	5,485	36.3	2,920	32.8	26.5
GDP at factor cost	15,116	100.0	8,910	100.0	
Net factor payments	5,078		2,583		24.2
GNP at factor cost	20,194		11,493		100.0

Source: Administered Territories Statistics Quarterly 1980, op. cit., p. 69.

The breakdown of gross national product reveals the significant role of remittances accrued to factor payments (largely labour) employed in Israel and abroad. On average, agriculture, business services, and factor remittances have contributed each around one fourth of GNP. However, when all services are lumped together their contribution rises to 35%. Though relatively high, this ratio is still much lower than that of Jordan, estimated at 55%.[1]

The following is a brief review of major economic sectors.

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1 Jordan's Five Year Plan for Economic Development 1976-80, op. cit., p. 29

Industry

The Industrial sector occupies a noticeably minor role in the West Bank economy, whether in terms of its share in the GNP (5%) or of the employed labour force (14%). Industrial firms consist predominantly of small household handicraft outfits in which family labour and capital are of primary significance. According to a recent study, about 93% of industrial firms had 1 - 9 workers in each, and there were only seven firms which had 100 workers or more.[1] The most common types of industrial firms included blacksmiths (15%), carpenters (15%), repair garages (16%), sewing and trico (14%), and stone-cutting and block-making (15%).[2]

Industrial development is hampered by many problems and constraints arising mostly from the onset of an occupation which aims at exploiting the market potential of the occupied territories to its own advantage. This has been effected by inequitable competition of local produce with Israeli goods, scarcity of finance facilities, competition with Israeli firms for local labour, and excessive tax harassments. Furthermore, industrial growth is hampered by Israel's inflation problems, the lack of abundant minerals and raw materials, and the boycott regulations enforced by neighbouring Arab States against Israel which, in several cases, actually affect the economy of the West Bank itself.

Construction

This sector has developed at rates which are much lower than those

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1 Hisham Awartani, A Survey of Industries in the West Bank and Gaza Strip (West Bank: Birzeit University, 1979) pp. 1 - 3.

2 Ibid, p. 26.

typical of the West Bank prior to the war, and of Jordan before and after the war. The areas of buildings begun during 1974 - 79 increased at 7% and they consisted almost entirely of private buildings.[1] Vivian Bull noted that buildings started in the city of Nablus in 1964, for example, were equal to the total urban construction in the West Bank in 1970.[2] The slow growth in the construction sector has resulted in over-crowding and a low level of housing facilities. According to a recent study the proportion of West Bank families of which three or more members occupy one room is 52%, as compared with only 4% in Israel.[3]

The construction sector has serious problems arising from Israel's efforts to minimize Arab physical presence in Palestine. This policy is effected through a number of agressive policies. Most importantly, this includes the denial of Palestinians not holding the Israeli-issued West Bank identity card of their right to build houses in their home towns. This cuts off what had been for long the most important source of finance for an unusually vigorous construction industry in the West Bank prior to occupation. The problem has been greatly aggravated by recent regulations banning all constructions (by Arabs) within 150 meters (450 feet) of all roads connecting West Bank towns.[4] This has drastically reduced the land area fit for housing and industrial services. The construction

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1 Derived from Table H/1 in the Administered Territories Statistics Quarterly 1980, op. cit., p. 98.

2 Vivian Bull, op. cit., p. 98.

3 Bakr Abu Kishek, The Housing Crisis in the Occupied Territories, (West Bank: Birzeit University, 1980), p. 17.

4 Instructions to applicants for construction licenses. A circular signed by the director of the Central Construction Planning Office at Beit Eil and addressed to all local authorities, May 1981.

industry has been additionally affected by the absence of housing credit institutions and the uncertain political environment.

Trade

Trading patterns in the occupied territories underwent comprehensive restructuring immediately after occupation. Trade with Jordan was reoriented within what came to be known as the "open-bridge" policy. That entailed permitting continued flow of West Bank export commodities to the traditional markets in Jordan and the Gulf states. Imports from Jordan, in contrast, were drastically curtailed because of security restrictions and very high tariffs. This has resulted in a large surplus which helps cover the West Bank deficit incurred in trade with Israel. Morethan 70% of exports to Arab markets consist of agricultural commodities (largely olive oil and citrus products. Industrial goods consist mainly of samneh (ghee), soap and stone.

Trade with Israel, on the other hand, has developed to a much more significant level. Israeli goods were given unrestricted access to the markets of the occupied territories.

Conversely, product from the territories were admitted to Israel on a small and selective scale and only when that served a felt need. Within this frame of inequitable terms of trade, Israel succeeded in less than two years following occupation in becoming by far the largest trading partner with the West Bank, providing it with over 86% of its imports and receiving 61% of its exports (see Table V - 9).

Table (V - 9)

Volume of international trade 1978

(Million Jordan Dinars)

	Exports to	Imports from	Excess of Imports
Israel	27.3	91.1	63.8
Jordan	16.8	1.5	-15.3
Other countries	0.3	12.8	12.5
Total	44.4	105.4	61.0

Source: Derived from Statistical Abstract of Israel 1980, op. cit., p. 685. Exchange rate for 1979 is averaged at IL83.9 per Jordan Dinar.

The consequences of the West Bank's constricted trade relations are pervasive and quite fundamental. Local producers have had to enter into competition with aggressive and better qualified Israeli producers. Expectedly, this has caused major problems for most kinds of business activity, particularly capital intensive enterprises.

In contrast, Israel has suddenly had at its disposal a large, very close, and totally unprotected market which could not have come at a better time. The occupied territories have in fact become such a significant market for Israel that they receive about one fifth of all its exports, ranking next only to the United States and exceeding half of Israel's exports to all EEC countries combined.[1]

Internal trade is similarly faced with numerous problems which have caused a sharp decline in what had been an unusually flourishing sector. Businessmen have to cope with a variety of continuously rising taxes. Most of them are not capable of maintaining sufficiently accurate accounts and there is evidence that this is often taken by customspersonnel as a reason to impose unduly high

[1] Derived from trade data in the Statistical Abstract of Israel 1978,

levies. Trade has further deteriorated, as we shall see in the next section, due to a number of problems arising from financial transformations.

The development of West Bank agriculture has a strong bearing on the constraints imposed by existing trading relations with its two neighbours, Jordan and Israel. At present, Palestinians can only expect some limited assistance from Jordan, whereas Israel cannot be expected, as long as it can do so, to forego it's valuable trading interests in the occupied territories. Accordingly, Palestinian planners have to relate their strategies to alternative political scenarios with markedly different economic ramifications. This aspect will be explored in a separate section.

Agricultural Trade

Traditionally, the West Bank has been a net exporter of agricultural commodities. During Jordanian rule, it was a major supplier of several farm products, notably olive oil, citrus, vegtables, grapes and bananas. Much of its surplus was marketed in the East Bank of Jordan and the Gulf States. On the other hand, the West Bank was self-sufficient in mutton, broiler meat and eggs, but it had to rely heavily on imports for beef, fish and milk powder.

The terms of agricultural trade changed drastically in the post-occupation era. Foremost, the West Bank became open to subsidized Israeli products enjoying all the benefits of scale. Conversely, the flow of Arab produce to Israeli markets was subjected to severe restriction arising from protectionist policies.

Despite radical transformations in the terms of trade during the post-occupation era, the West Bank's agriculture continued to occupy

a prominent position in its international trade, though on a considerably smaller scale. A commodity breakdown of exports and imports for 1979 (see Table V - 10) reveals that about one-third of all exports were of agricultural origin, as versus only 14% of imports. The value of agricultural imports rose so rapidly that they exceeded exports within a few years after the onset of occupation. Again, this is an indication of diminished production on the one hand, and exposure to Israeli competition on the other. It is clear therefore that a major target of a Palestinian agricultural policy is to bring this trend to a halt, and possibly try to reverse it. A forthcoming Palestinian state will find it exceedingly difficult to develop an industrial sector competitive to that of other countries in the area (less so of Israel's), but it cannot afford to loose its traditional comparative advantage in agriculture. While this is underlied by tangible economic realities, it is dictated even more markedly by the political aspirations of the Palestinian people.

Table (V - 10)

Relative significance of agricultural trade (1979)

	Total		Agr. commodities*		
	IL	Jordan Dinars	IL	JD**	% of Total
Exports	3,726.4	44.4	1202.0	14.3	32.2
Imports	8,974.6	107.0	1279.5	15.3	14.2
Trade deficit	5,248.2	62.6	77.5	0.9	1.5

* Includes olive oil and other processed agricultural products, which are classified as industrial in the original reference.

** Converted at the market exchange rate for 1979, which averaged at IL 83.9 per Dinar.

Source: Administered Territories Statistics Quarterly 1980, op. cit., p. 6.

Finance

The monetary and banking systems in the occupied territories were disrupted and restructured after occupation. The developments in this regard are summarized below:

1. Jordanian and Israeli currencies were concurrently circulated as legal tender. The first was used for hoarding purposes by West Bankers, on account of its stability, while the second was maintained in quantities just enough to allow for current business transactions.

2. Arab banks closed down and were replaced by branches of Israeli banks. The latter, however, failed to conduct their business beyond services involving settling current transactions between businessmen on both sides of the Green Line (the frontier).

3. The soaring inflation rates in Israel, exceeding an annual average of 100% during the past few years, have had a drastic impact on the West Bank economy. With rapidly depreciating currency, it became extremely difficult to achieve a real return on investment, even allowing for numerically high profit margins earned during current transactions. The crux of the problem is that the net worth of a firm as measured in a relatively stable currency, commonly the Jordan Dinar, can hardly exceed the opening net worth, because of dramatic devaluation of the Israeli Pound relative to the Dinar, exceeding 30% in most years (see Table V - 11). This in effect means that in order to be able to claim a real profit, a firm should earn an unusually high return on its initial investment, as valued in Israeli Pounds.

Table (V - 11)

Average exchange rates of the Israeli Pound

(1971-80)

Year	Jordan Fils/IL	% depreciation	Year	JF/IL	% depreciation
1971	95	-	1976	34	30.6
1972	79	16.8	1977	31	8.8
1973	75	5.1	1978	18	41.9
1974	58	22.7	1979	12	33.3
1975	49	15.5	1980	6	50.0

Source: Karsou Exchange Office, Nablus.

The aforesaid financial transformations have had grave consequences on the economy and labour market in the occupied territories. In the first place they have precipitated a massive flow of capital to Jordan and foreign money markets. Most businessmen and farmers refrain from sinking large capital outlays in the occupied territories, and instead they move them out where returns are higher and investment is safer. Furthermore, many of the smaller businessmen and artisans have found it more prudent to leave and join the less risky and seemingly more remunerative labour market. The political and economic implications of this phenomenon are obviously grave.

Agricultural Income

Relative share in the economy

The relative share of agricultural income in the GDP has varied from 30 to 40%, with an eleven year average of 34% (see Table V - 16). Its share in the GNP, on the other hand, was much lower and it averaged at 26% during the same period. Despite being somewhat lower than the ratios in most under-developed countries, the shareof West Bank agruculture in its GDP is noticeably higher than in Jordan

and Israel (see Table V - 15).

Statistical analysis of secular trends in the relative share of agricultural income points to a relatively stable proportion of the GDP and a slowly declining proportion of GNP. Evidently, it will be a long time before agriculture looses grounds to other production sectors in West Bank economy, despite the likelihood of a further decline in its share in the GNP should remittances from labour gain further momentum.

Table (V - 15)

The relative share of agriculture in Gross Domestic Product (1979)

	% of GDP		% of GDP
West Bank	(27)	United Kingdom	2
Jordan	8	West Germany	2
Syria	16	United States	3
Egypt	23	Israel	5
Sudan	38	U.S.S.R.	16

Source: World Development Report 1981, op. cit., pp. 138 - 139.

Annual fluctuations in income

Income originiating in agriculture (see Table V - 16) is characterized by a marked degree of variation from year to year - even after discounting for variations in prices. This is due to the predominance of rainfed patterns of farming which are characterized by heavy dependence on climatic factors for a good yield. While this applies to most field crops and fruit trees, it is particularly significant in the case of olives, which account for 15-35% of agricultural income and which are characterized by extreme periodicity.[1] Plotted on the basis of available data, Chart

[1] This relates mainly to the habit of alternate bearing which will be discussed under the section on olives.

Table (V - 16)

Secular changes in agricultural income

(IL-millions, unless stated otherwise)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
GNP - 1968 prices	417	473	591	743	705	892	842	1051	998	1154	1142
GDP - 1968 prices	377	411	471	578	527	688	638	774	748	882	841
Agr. income - at market price*	153	141	203	307	372	795	713	1243	1381	3222	4722
" " - at 1968 prices	146	135	160	201	188	293	184	257	208	308	254
" " - in Jordan Dinars**	16.1	14.1	19.3	24.4	27.8	46.2	34.8	42.7	31.2	56.8	56.3
" " - % of GDP	38.7	32.8	34.0	34.8	35.7	42.6	28.8	33.2	27.8	34.9	30.2
" " - % of GNP	35.0	28.5	27.1	27.0	26.7	32.8	21.8	24.4	10.8	26.7	22.2
" " - % of annual change,		-7	18	26	-6	56	-37	40	-19	48	-17

- measured at 1968 prices.

* Value of agricultural output less the cost of purchased inputs

** Agricultural income at market price, converted to Dinars at ruling exchange rates

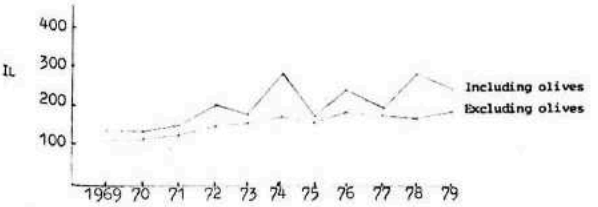
Sources: Statistical Abstracts of Israel, for respective years, primarily Vol. 27, 1967, p. 688 and Vol. 31, 1980, p. 680.

(V - 1) shows a substantial drop in annual variation of gross agricultural income, when olives are excluded.

Evidently, the pronounced variation in income received by farmers in rainfed areas has grave economic consequences. Most importantly it reduces their shock-absorbing capacity and renders them overly conservative in accepting technological change.

Chart (V - 1)

Annual variations in agricultural income



Rate of growth

The rate of growth in agricultural income is a highly controversial issue. Israeli sources, for instance, speak of a phenomenal growth rate which they say "is unparalleled in other countries",[1] and "fastest in the world",[2] Much of this, the researcher believes, is rhetoric.

Evaluation of growth in agriculture rests on two major criteria, income and physical output. Due to radical shifts in the price structure, changes in income, as will be discussed later, do not

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1 Moshe Levi, op. cit. p. 1.

2 Y. Oked "Farm Growth in the Areas 'Fastest in the World'", Jerusalem Post, April 16, 1976, p. 1.

necessarily reflect corresponding changes in output. Furthermore, the accuracy of income and output estimates is shadowed by serious doubts arising from unreliable collection tools and probable political motives. Nevertheless, the reported data may be reliable enough to indicate major trends.

Income from agriculture during 1969 - 79 rose in five years, at an annual average of 46% and dropped in five at an average of 17%. Measuring the rate of growth on the basis of the average income for 1969 and 1970, as compared with the average of 1978 and 1979, we notice that income from agriculture (at 1968 prices) rose by 100% during a period of nine years, i.e. at the rate of 11% per annum.

A growth rate of that magnitude is undoubtedly high in international standards, and it compares favourably with most other developing countries. Jordan, for instance, achieved a growth rate of 8.3% during 1960-66[1] which is also high in international standards (see Table V - 17).

Table (V - 17)

Annual growth rate in agriculture (1970-1978)

Country	% growth rate	Country	% growth rate
India	2.6	Israel	6.6
Tanzania	4.5	Libya	12.7
Egypt	3.1	United Kingdom	0.8
Syria	7.2	United States	0.9

Source: World Development Report 1980, op. cit., pp. 112-113.

However, the growth rate of agriculture post-occupation should be

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1 Yousef Abdul Haq, op. cit., p. 243.

scrutinized and interpreted more carefully than what is otherwise indicated by official data. Again, there are serious doubts regarding the reliability of official data. Many well informed sources, some of them Israeli, cast serious doubts on their validity. Among those who do is the man in charge of West Bank economy studies at the Bank of Israel.[1] Available data on physical output, as we shall see later, raises many questions on the reliability of income data. Most important there is a margin of upward bias resulting from taking the interval immediately following occupation as a base-line for measuring subsequent growth, since agriculture then was still handicapped by the aftermath of the war.

In evaluating the growth rate of agricultural income, one has to remember that West Bank agriculture was more prosperous prior to occupation than that of the East Bank, and it is reasonable to assume that its growth might have accelerated after 1967 had it not fallen under occupation. With Jordan's agriculture achieving a growth rate of over 8% during the seventies, the West Bank could well have been even higher than under Israel.

To conclude, income originating in agriculture has shown a high rate of growth. But this was induced largely by a rapid rise in the productivity of certain high-price products and not by a general rise in aggregate output. The latter point will be discussed in a later section. Indeed, the rate of growth in West Bank agriculture indicated in the official statistics discussed here must be treated with caution. The next chapter discusses the major agricultural sectors and gives, in some detail, a different perspective, one which has been confirmed by the researcher's field work. The differences cannot easily be fully explained in terms of differential inflation rates in different sectors of the West Bank economy.

1. See footnote (1) on page (11).

PART 2

CHAPTER VI

CHAPTER VI

WEST BANK AGRICULTURE - AN OVERVIEW

Agriculture in under-developed countries is characterized by stereotyped socio-economic features which seem to vary only in magnitude. In most of these countries agriculture constitutes a major proportion of their domestic product, typically in the range of 30-40%, and provides employment for more than half of the active labour force. Although it was indicated in previous chapters that West Bank agriculture is not typical in either of these attributes, it nevertheless remains the most important sector for reasons bearing on the fundamental issues lying at the heart of the Israeli-Palestinian conflict.

It is evident that vigorous West Bank agriculture entails an extensive and deep attachment for absorbing an increasing number of repatriates when that is politically possible. Both of these points occupy a prominent position on the perceived list of strategic objectives for a national agricultural policy.

This chapter is intended to provide an overview of West Bank agriculture. As such it compliments chapters III and IV covering other aspects of resource conflict.

Agriculture as a source of food supply

The role of West Bank agriculture as a source of food supply for local communities is no less important than its role in international trade. As is typical in most peasant forms of agriculture, the bulk of farm produce is consumed by rural families themselves and nearby rural communities, leaving only surplus produce to be channelled into export trade. This is clearly exemplified by the

fact that only 21% of the estimated value of agricultural output for 1979 went into exports, and the rest was generated through local handling of produce.[1]

The nutritional role of agriculture is undoubtedly substantial and it could be defined through two major parameters. First, it aims at restraining excessive dependence on Israel for food supply. According to available data (see Table VI-1) the West Bank relies heavily on imports (practically all from Israel) to meet the dietary needs of its resident population. In addition to its important economic implications, such a tight nutritional subordination of the West Bank entails serious political hazards by offering Israel additional leverage in its dealing with any forthcoming Palestinian authority.

Second, West Bank agriculture is not only expected to meet the demand for food by its current population, but it will also have to cope with the expected sharp rise in the demand for food should Palestinian refugees be permitted to come back home in the wake of a political settlement. As we shall see later in the section on objectives of agriculturel development, this might cause a sharp rise in the demand for food, perhaps in the range of 50%.

Another question on the nutritional role of agriculture stems from the possibility of having certain forms of malnutrition. Although West Bankers do not seem to suffer from undernutrition, as could be inferred from Table (VI-2), some of them do face a

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1. Computed from data on exports and agricultural income reported in the Statistical Abstract of Israel 1980, op cit, pages 685 and 701.

problem of malnutrition arising from their low intake of animal protein, amounting only to 41% of that in Israel. A rational agricultural policy should address itself to alleviate such qualitative deficiencies.

Table (VI - 1)

Domestic consumption of major food items, by source - 1979

(Quantity in tons)

	Total domestic consumption (tons)	Estimated local production (tons)	% of total
Wheat	87,350	29,700	34
Potato	11,925	8,300	70
Sugar	23,100	———	10
Vegetable	113,900	140,900	124
Citrus	43,800	79,100	180
Olive oil	7,600	10,000*	131
Grapes	24,100	45,100	187
Banana	11,900	5,500	46
Mutton	6,200	9,700	156
Chicken meat	12,200	9,400	77
Fish	1,300	———	10
Eggs	3,125	2,337	78
Cow milk	19,350	15,300	79

* This is a crude annual average

Source: Administered Territories Statistics Quarterly 1980, op cit, pp 88 and 102-103.

Table (VI - 2)

Daily per capita food intake (1979)

	Israel	West Bank	% of Israel
Calories	3039	2833	93
Fat (grams)	113.5	70.8	62
Protein (grams)	96.4	81.2	84
-Thereof animal protein	50.3	21.1	42

Source: Statistical Abstract of Israel 1980, op cit, pp 280, 687.

Changes in output and acreage

There have been fundamental structural changes in output patterns in the post-occupation era. These changes have developed gradually as a result of transformations in cropping patterns and a substantial improvement in productivity.

Comparison of output and acreage statistics before and after the occupation offers useful information on the structural transformation in West Bank agriculture. Although data is available and fairly comprehensive, the comparison is still complicated by an important procedural difference in the processing of collected statistics. Prior to occupation, the Ministry of Agriculture relied totally on extension personnel for collecting acreage and output data. Following occupation, agricultural statistics continued to be collected by the same people and practically using the same techniques. But when they are passed over for publication to the Central Bureau of Statistics (CBS) they are heavily discounted, apparently in an attempt to have them refined. But as the CBS staff does not have access to West Bank agriculture other than through the Department of Agriculture one might suspect that the discounting of acreage and output statistics is motivated, at least in part, by political

motives. It appears that Israel's encroachment policies are better served by emphasizing the barren image of West Bank land.

Bearing this factor in mind Table (VI-3) measures rates of change in the output of major farming patterns on the basis of the average yields for the last three years preceding occupation.

Table (VI - 3)

Trends in output

(Quantity in thousand tons, livestock in number)

Branch	Average for base period, 64-66	1969-72 average Quantity	% change	1976-79 average Quantity	% change
Wheat	51.0	34.4	-33	31.8	-38
Tomato	48.3	34.4	-30	41.9	-13
Cucumber	15.6	9.9	-37	24.8	60
Melons	75.2	23.1	-69	19.6	-74
Citrus	30.9	47.1	52	81.8	165
Olives	39.8	35.3	-11	43.2	9
Sheep and goats (000)	651.3	434.2	-33	398.2	-39
Cows (000)	34.6	28.6	-17	15.0	-57
Broilers	2902	3442	19	3351	15

Sources: 1. Administered Territories Statistics Quarterly, 1980 op cit pp 88-89.

2. West Bank Agriculture 1974, op cit, pp 10-11.

3. Burhan Abu Howayj, Agricultural Atlas of Jordan (Amman: Ministry of Agriculture, 1974).

Although the data in the Table (VI-3) may conceal wide margins of error, yet they still reveal significant changes in production patterns between pre and post occupation eras. These changes are summarized below:

1. Wheat output decreased by about one third due to a sharp decline in its acreage following closure of extensive areas for "security" purposes.

2. Another significant drop and for similar reasons, occured early after occupation with tomato and cucumber, but output later picked up until it markedly exceeded pre-occupation levels. This is due to a rapidly rising productivity following the extensive dissemination of protected farming techniques.

3. Melon output dropped sharply to one fourth of the pre-occupation level. This was similarly influenced by constraints on acreage, but also by competition with mechanized intensive production in the Negev.

4. Citrus production showed a sharp rise. This is attributed primarily to the coming into production age of many young citrus groves and, to a smaller extent, to a modest rise in productivity.

5. No stable changes are detected in olive output other than cyclical changes relating to alternate bearing and climatic factors. Output was depressed by factors relating to poorer husbandry, but this effect is probably more than offset by the maturity of young orchards coming into full production.

6. The population of sheep and goat flocks dropped by over one third of its pre-occupation size. Typically this was due to the drastic drop in the area of natural grazing pastures on the eastern slopes, which constituted a major target for Israel's land encroachment policies.

7. Likewise, the population of cows dropped by over 50% but for different reasons. Palestinian cow-owners find it impossible to compete with Israeli dairy producers, who receive extensive subsidies and other forms of support through their nationwide cooperative, "Tnuva".

8. Broiler production showed an increase in the early years of occupation, but then it started to feel the effects of competition with heavily subsidized Israeli broilers. Output may even have dropped over the last two years (1979-81) to well below its pre-occupation level.

Changes in acreage

Changes in areas under major cropping patterns were even more pronounced than those of output. This is illustrated in Table (VI-4) which again monitors the magnitude of change on the basis of pre-occupation averages.

Table (VI - 4)

Trends in acreage

(thousands of donums)

	Average for base period, 63-66	Average area 1968-70	Percent change	Average area 1977-79	Percent change
Field crops	1015.4	962.8	-5	716	-29
Vegetables	257.2	79.6	-69	105	-59
Melons	75.0	22.3	-70	4	-95
Fruit trees	789.5	702.2	-11	832	5

Sources: 1. Statistical Abstract of Israel 1972, op cit, p 665.

2. Abu Howayj, op cit, scattered pages.

3. Moshe Levi, op cit, p 4.

The above figures indicate a substantial drop in the acreage of field crops (30%) which has taken place mainly in the north-eastern hill slopes (Toubas area) mainly for coercive security and settlement purposes. But in addition there was a sharp contraction in areas under grains on marginal lands for obvious economic reasons. The decline in area under vegetables, on the other hand, was most visible in the Jordan Valley, where security and settlement activities are most pronounced, whereas the decline in the area under melons was due largely to competition problems with Israeli produce.

The aggregate area under fruit trees does not reflect severe variations because of the usually slow response to factors bearing on tree culture. More recently there have been marked expansions in olives, almonds and grapes.

The dynamics of change in acreage and output of various patterns of farming reflect a variety of economic and non-economic factors which should be taken into careful consideration when planning agricultural development. These factors will be later reconsidered in the light of profitability analyses conducted for major patterns of rainfed farming.

Composition of agricultural product

Despite pronounced variations in the West Bank's physical geography, its agriculture is dominated by relatively few patterns of farming. Olive production is by far the most important branch, with a share ranging widely from 8-35% of agricultural income (see Table VI-5). Citrus follows next in importance with an average share of 10%. When lumped together, fruit trees contribute around 45% of all income originating in agriculture.

Income from vegetable crops vary less violently because of lesser dependence on rainfall. Their share of agricultural income averages at about 17%, contributed mainly by tomato (3.5%) and cucumber (3%). Field crops are least significant in terms of their contribution to agricultural income, with an average share of 6%.

Adding all crop sectors together (trees, vegetables, and grains) their combined income comprises around 68% of agricultural income, which leaves livestock and poultry with a share of about one third. The reasons for the retarded growth in this sector will be explored later under the section on livestock and poultry.

Table (VI - 5)

Composition of agricultural product

	1977	1978	1979	Average
Gross value of agr. product in IL millions at market price	1734	3757	5675	3722
Sectoral distribution - percent:				
Crop sectors, thereof:	67.0	75.7	62.9	68.5
Field crops	7.1	5.5	6.4	6.3
Vegetable Crops	21.0	14.3	15.0	16.8
Fruits, thereof:	37.9	55.2	40.6	44.6
Olives	7.8	33.9	18.6	20.1
Livestock and poultry	33.0	24.3	37.1	31.5

Source: Administered Territories Statistics Quarterly 1980, op cit, p 89.

Technology Change

Productivity in agriculture has shown a rise over the past decade. Accurate assessment of productivity by type of farming and production region is beyond the scope of this research. Table (VI-6) however, presents a summary of yield estimates for some types of agriculture, assessed from a variety of sources. The data on rainfed farming patterns is based on the findings of this research, and those for irrigated crops are quoted from official data, as computed on the basis of aggregate figures of acreage and output.

Table (VI - 6)

Productivity trends

(kilograms per donum)

	1966	1978
Wheat	84	153
Barley	80	170
Chickpeas	55	78
Tomato*	1114	1846
Cucumber*	946	1557
Citrus*	2396	3015
Grapes	285	700
Almonds	105	82
Olives	Not quoted due to severe cyclical variations	

Sources: For 1966 - Agricultural Atlas of Jordan, op cit, relevant pages.

For 1978 - Data collected from district offices of the Department of Agriculture.

* Irrigated.

The data in Table (VI-6) indicates a number of important features in productivity. Although output per unit increased markedly in all types of farming, it is apparent that the rise in irrigated crops is considerably greater than in those dependent on rainfall. This is not unexpected in view of the much stronger thrust towards intensifying irrigated agriculture using modern technology. To a lesser extent, rainfed agriculture in flat areas (mostly in Jenin district) has also shown a marked technological change.

There have been a number of unfavourable factors that have discouraged the development of rainfed technology on hilly areas, most importantly the following:

1. Prices of production inputs (mainly labour) have risen at rates

much higher than those of most rainfed products. It was found, for instance, that the cost of animal ploughing has shown a rise of about 500% since 1967, as compared with only 250% rise in the price of wheat. This has resulted in a steady and marked shift in the pricing structure against the interest of farmers in dry areas.

2. Israeli research centres have generally shown little interest in improvizing forms of technology which are specifically suited for hilly agriculture in the West Bank, or for that matter, inside Israel itself. The obvious reason for this attitude stems from a deep conviction in the non-viability of most types of hilly agriculture, particularly when there is still (in Israel) a large area of untapped flat land.

Scarcity of appropriate technology is further aggravated by markedly weak connections of West Bank extension staff with sources of technology in other parts of the world, as explained earlier in the section on agricultural extension and research.

3. Even when a new technology has been proved productive and adequately remunerative (eg. chemical weed control) its dissemination might be impeded by a number of discouraging factors, such as excessively small size of land parcels and their extensive dispersion, inadequate cooperation among small neighbouring farmers, and scarcity of credit facilities.

4. Farmers in rainfed areas, in clear contrast to those with access to irrigation water, are more reserved in accepting new technologies.[1]

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1. No attempt was made to quantify this important conclusion. But taking olive culture as an example, the evidence is convincing. As will be noted later, about 95 percent of olive growers add no fertilizer at all, almost 100 percent of them do not spray against pest infections, and very few of them have tried weed killers.

To some extent this is attributed to their usually older age and low literacy. Their reticence has been further accentuated by their poor confidence in the professional aptitude of extension staff which, they believe, may jeopardize their fragile economic base. This reservation was mentioned frequently by respondent farmers during this study. Judging by the low level of professional training of most extension staff, this reservation is not unfounded, although it is somewhat exaggerated.

The process of technological change was initiated in the late fifties in response to intensive government and private efforts. It then picked up at a fairly rapid pace in the last few years prior to occupation. In the post-occupation era, this process picked up further momentum due to sudden exposure to Israeli technology, mainly through direct contacts with dealers of farm supplies. Yet it is a gross exaggeration to attribute all progress achieved in raising productivity to exposure to Israeli sources. Counting on its pre-war record, West Bank agriculture was likely to make progress during the period in question. In fact, Jordan's agriculture which was conventionally less developed than that of the West Bank, has taken long strides over the past fifteen years in modernizing its production technology, as could be inferred from Table (VI-7).

Increased productivity has been largely a function of expanded use of several modern inputs. A comparative analogy of the rate of use of certain inputs in the West Bank, Jordan, and Israel sheds some light on the pace of agricultural technological change in the three countries (see Table VI-7).

Table (VI-7)

Some indicators of technological change

	West Bank		Jordan	Israel
	1968	1978	1977	1977
Area under cultivation (000 donums)	2045	2000	3900	4250
Number of tractors (total)	120	1673	4074	22850
- per 10,000 donums	0.6	8.4	10.4	53.8
Fertilizer use (total in tons)	4000	11600	24000	278000
- kilograms/donum	2.0	5.8	6.2	65.4
Area covered with plastic (donums)	None	7500	8000	31044
Area under drip irrigation (donums)	None	8775	491	190000
Value of purchased inputs - In IL mill at 1969 prices	30.9	55.6	n.a.	1645.3

Sources: 1. Judea and Samaria Agriculture 1978, op cit, p 13.

2. Statistical Abstract of Israel 1980, op cit, p 356.

3. Agricultural Statistics Quarterly (Jerusalem: Central Bureau of Statistics) Vol XI, 1979-1980, No 3, p 39.

4. Agricultural Statistical Yearbook, op cit, p 66, 77

5. Interview with Director of Agricultural Economics Department, Amman, October 20, 1981.

Despite a noticeable expansion in fertilizer and tractor use, the data in the previous table reveals that the West Bank lags behind Jordan in the use of tractors and fertilizer, while Israel is far ahead of both of them in all aspects of technological change. Likewise, it is noted that the ratio of purchased inputs in the West Bank is only about 17% of total agricultural income as compared to 30% in Jordan and 52% in Israel. In view of the reasonable technological ability of West Bank farmers, this pronounced lag in the use of technological innovations is explained mainly on the basis of the broader issues of reduced profitability

inadequate source of credit, and depressive institutional policies.

Notwithstanding obvious weaknesses in productivity levels and the process of technological change in the West Bank, the researcher does not believe that this necessitates an indiscriminate thrust towards modern technological change in its agriculture. Any such process should be based on a localized evaluation of the political and social - in addition to the economic - ramifications of each individual form of technology. It may be safe to suppose that intensive patterns of agriculture, mostly irrigated, need to maintain a sustained access to modern technology. But the situation is much more complex and difficult to judge in the case of peasant types of farming. This will be explored at greater length in the chapters on the economics of rainfed agriculture.

Significance of rainfed farming

The division of land with respect to the source of water reveals that the area fed by rainwater constitutes about 95% of all cultivated land, whereas the area under irrigation is estimated at about 85,000 donums, which amounts to 5% of all actively cultivated land estimated at 1,608,700 donums.[1]

Surprisingly, the ratio of irrigated land is considerably lower than in most countries in the Middle East, though as outlined earlier, the West Bank is more humid than most of them. The crucial difference lies in the political circumstances of the West Bank which appear to have deprived local citizens of opportunities to exploit available water resources.

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1. Administered Territories Statistics Quarterly 1980, op cit, p 95.

Table (III-13)

Ratio of land under irrigation in some countries of the Middle East (%)

Country	% of total cultivated	Country	%
Iraq	49.3	Syria	9.3
Jordan	7.4	Lebanon	29.3
West Bank	5.0	Israel	44.0

Sources: 1. Adbulla Arar, op cit, p 31.

2. Statistical Abstract of Israel 1980, op cit, p 9.

While the foregoing statistics emphasize the significant role of rainfed patterns of agriculture, irrigated farming is much more significant than is implied statistically. Thus while irrigated agriculture occupies only 5% of all cultivated land, its contribution to agricultural income amounts to about one third of the total net income. Furthermore, it is quite clear that irrigated farming lends itself much more easily and rapidly to technological change and intensive production. Therefore it is important for any forthcoming Palestinian authority to expand water use in agriculture to whatever limits are imposed by political realities. But in the meantime it is rainfed agriculture which will continue to maintain a critical role in West Bank's socio-economic life.

The importance of rainfed agriculture relates to many attributes of the West Bank economy, politics, and social structure. Its contribution to the domestic product (GDP) as could be assessed from Table (V-16) is certainly sizeable and amounts to about one fourth of the GDP for most years. But when the figures of output and income are viewed on a regional basis the share of certain patterns of farming in local economies can be far more substantial (examples: grapes in Halhoul, olives in Salfit, grains in Jenin and sheep in Yatta). Furthermore, it could be

argued from a distributional point of view that small size family holdings provide a critical shock-absorbing capacity for peasant families in the lower levels of the economic strata.[1] In this sense it is observed that the importance of most rainfed products as sources of staple food for local communities goes much beyond their purely monetary remuneration.

The labour absorption potential of rainfed agriculture deserves special notice. Although there is no detailed statistical evidence on the vocational distribution of agricultural workers, yet it is clear that the vast majority of them are absorbed in non-irrigated forms of agriculture.

But the real absorptive capacity of rainfed agriculture is certainly much greater than is indicated in statistics on labour distribution. The important point to remember is that dry farming patterns have drawn heavily on forms of labour which have a markedly low opportunity cost (eg. old family members, women and children, and the spare-time workers). In this way it has been possible to mobilize certain forms of non-marketable labour into active production and at reasonable levels of efficiency, given the constraints imposed by existing political and socio-economic realities.

The ramifications of land use in rainfed agriculture deserve special attention. In the first place it should be re-emphasized that this kind of agriculture utilizes about 95% of all cultivated land.[2] The economic rationale here is clear enough, and it focuses

1. A widely common proverb in rural communities says that "the family need not worry as long as it has got two lions at home: wheat and (olive) oil" - both are rainfed products.

2. Administered Territories Statistics,Quarterly 1980, op cit, p 95.

mainly on the need to raise the productivity of such an abundant resource. This is further rationalized by existing natural and political constraints on irrigated agriculture.

But the reclamation and active exploitation of rainfed land bears heavily on the volatile (and undoubtedly crucial) issue of land ownership currently disputed between Palestinian Arabs and the Israeli settlement authorities. There is evidence that Israel has utilized limitations and anamolies in existing forms of ownership, of which there are many. But it is still possible to counter Israel's expropriation policies by measures which would make those policies more difficult to implement. An effective step in this direction is to initiate an aggressive policy of extensive land use.

Admittedly this endeavour may not be adequately justified on purely economic grounds. But then it can be argued that Israel has committed considerable economic resources in its efforts to implement its religious commitments in Palestine. If this argument of a political imperative is accepted by Palestinian Arab planners, and the overwhelming evidence suggest that it is, then the priority should go first to where the land is - rainfed agriculture.

Economic setting of dry farming enterprises

The economics of dry farming patterns pose many unresolved questions about their real economic significance and profitability status, despite the abundance of such studies involving farm management and agricultural economics. Evidently, this has left planning of agricultural development unduly dependent on somewhat unreliable statistics or even circumstancial evidence.

This research has had a primary objective of attempting to ascertain a concise economic perspective of major rainfed patterns of agriculture. Each type was evaluated individually in regard to its economic significance (acreage, output income), profitability situation, and production and marketing problems. The results of this study are summarized in chapters VI, VII, VIII. Each chapter is concluded by policy guidelines which are to be observed in later chapters on development planning. It should be emphasized at this point that the mandate of this research does not (and in fact cannot) provide a full-fledged cost/benefit analyses for respective farming enterprises based on a sample fully representative of all important attributes. It does attempt to evaluate de facto profitability in major production areas and taking into consideration dominant production techniques. Realizing the importance of more vigorous economic studies, this assignment will be given a high priority in the future programme of the Rural Research Centre at An-Najah National University.

CHAPTER VII

CHAPTER VII

ECONOMICS OF RAINFED FRUIT TREES

Fruit trees constitute the backbone of West Bank agriculture, whether in terms of area or contribution to agricultural income. Counting on the average for the last three years, fruit trees have occupied 905.6 thousand donums (60 percent of the area under cultivation) and contributed 45 percent of gross agricultural income (see Table VII-1)

Table (VII - 1)

Area, output, and income from fruit trees

(Average for 1977,78,79).

	Area '000 don.	Area % of total	Output '000 tons	Share in agr. income percentage
Grand Total	940.8	100.0	210.0	45.2
Rainfed - total	905.6	96.3	117.7	35.3
Olives	669.1	71.2	41.0	22.1
Grapes	92.2	9.8	41.4	6.1
Almonds	78.5	8.3	6.3	2.6
Plums	32.1	3.4	17.3	2.7
Apricots	4.7	0.5	1.7	0.2
Figs	29.0	3.1	10.0	1.6
Irrigated - total	27.5	2.9	87.4	9.1
Citrus	25.5	2.7	81.8	8.2
Bananas	2.0	0.2	5.6	0.9
Others - total	7.7	0.8	4.9	0.8

Sources: 1. For areas: Files of the Department of Agriculture.

2. For output and income: Administered Territories Statistics Quarterly 1980, vol 1 - 2,, pp 88-89.

The above data indicates that rainfed fruit trees are far more significant than irrigated trees, whether in terms of area (95-96 percent of total) or share in farm income (35 percent against 9 percent). A breakdown of area and income shows the relative importance of all major types of fruit trees. The following section contains a fairly detailed account of the economics of production of olives, grapes and almonds, and a brief review of plums, figs and apricots.

Olives

The olive tree is indigenous to Palestine and it has always played an important role in its economy, in addition to having a deep-rooted spiritual value.[1] It is a notably long-lived tree, it is commonly believed that some olive plantations may be so old that they date back to the Roman era! In most respects olive culture is the most important single farming pattern on the West Bank. As such, it has received special attention in this study.

Area and distribution

According to official statistics the area under olives in 1979 amounted to 734.7 thousand donums, i.e. 79 percent of all the area under fruit trees and 40% of the total cultivated area. Interestingly, these ratios are considerably higher than those in Israel, where olives occupy at present only 3 percent of cultivated land, and 83 percent of that olive area is owned by Arabs.[2]
Olives are grown with varying intensity in all West Bank geographical regions, except for the Jordan Valley and those overlooking hills where annual rainfall in usually below 250 millimeters. Its

1. The olive tree was cited with esteem in the Koran and Bible, and it was frequently related to the land of Palestine.

2. Statistical Abstract of Israel 1980, op cit, pp 356-365.

intensive dissemination is attributed to its hardiness and tolerance to a wide range of climatic and soil variations. Table (VII-2) shows that olive farming is concentrated in the northern districts (Tulkarm, Nablus and Jenin) which account for three fourths of area and output.

Although particularly suited for olives, the Hebron district is not an important producing area, as it is much better known for its grapes and stone fruits. In recent years, however, farmers in that district have embarked on a vigorous campaign of growing new olive orchards. Table (VII-2) shows that about half of all new plantations (around 26000 donums) are grown in this district. Hebron farmers, evidently, have come to realize that they have too much more land under grapes which have proved particularly vulnerable to price problems arising from over-supply and perishability. Growing olives helps farmers stabilize income and exploit their marginal land resources, without having to put in very large investments in reclaiming rocky slopes, as they do for grapes.

Table (VII - 2)

Area of olives by district (1980)

District	Area (donums) Productive	Non-productive	Percent of total
Total	665,840	68,900	100.0
Jenin	131,600	7,600	19.8
Tulkarm	210,000	19,100	31.5
Nablus	147,200	8,900	22.1
Ramallah	141,515	6,400	21.3
Jerusalem	1,620	-	0.2
Jericho	36	-	-
Bethlehem	13,769	1,000	2.1
Hebron	20,100	25,900	3.0

Source: Files of district offices of the Department of Agriculture.

Output and income

Production of olives is characterized by such a periodicity that it becomes difficult to talk about a truly representative and reasonably stable output. This is clearly indicated in Table (VII-3) which shows that olive output can go as low as 10,000 tons and as high as 110,000 tons. Accordingly, income from olives fluctuates markedly, though much less than physical output, partly due to an inverse price correlation. Counting on the records for the past six years, olive output has averaged at 49,000 tons and it accounted on the average for 22 percent of all income originating from agriculture.

Table (VII - 3)

Output and income (1974 - 79)

	1974	1975	1976	1977	1978	1979	1980	Average
Olive output (000, tons)	100.0	10.0	50	17.0	85.0	21.1	24.4	48.8
Value (JD mill)*	46.2	34.8	42.7	31.2	56.8	9.2	38.9	37.1
% of agr income	34.5	6.6	19.5	7.8	33.9	I4.3	38.0	22.1

* The average of the olive crop is estimated in Jordan Dinars, as it is meaningless to put it in the Israeli pound due to its drastic devaluation during the past six years. Conversion was made at the ruling rates of exchange.

Source: Statistical Abstracts of Israel for respective years.

Significance to local communities

Olive products command a much greater significance to local communities than is indicated by aggregate economic criteria. An over-riding consideration is that income from olives accrues mostly to peasant families who are generally in the lower scale of income brackets. Consequently, any improvement in this sector would help achieve a more equitable distribution of income.

Likewise, olive products meet a critical dietary need for rural communities as being practically the only kind of oil in use. Accordingly, they are estimated to provide village consumers with over half of their fat intake and about 15% of their caloric intake.[1] The extensive prevalence of the tree, mostly in small-holdings owned by peasant families, is instrumental in providing these families with their own oil rather than having to buy it. In this sense olive production helps avoid certain forms of malnutrition among rural communities.

1. According to the nutritional balance sheet for 1978/79, olive oil provides on the average (all West Bank) about 9% of caloric intake and 42% of fat intake (Administered Territories Statistics Quarterly 1980, Vol. X (1-2, p 103).

There are other important secondary returns of olive culture. Non-edible oil residues are used by most producers in making good quality soap. It is customary to "cook" the family's year supply of soap following the completion of pressing operations. Incidentally, it should be pointed out that the soap industry of Nablus, which was once a major consumer of inferior quality oil, has replaced olive oil with cheaper imported oils. Regaining this market, though quite unlikely at the present, could help markedly expand the demand potential for olive oil.

Olive wood resulting from pruning operations is extensively used as a fuel in rural communities. With the sharp rise in the cost of petrol, olive wood meets a badly felt need. In southern districts thick olive wood is in strong demand by producers of wooden religious artifacts. Olive oil pulp, remaining after oil extraction, is also used widely as a fuel and could possibly be used in manufacturing feed mixes. Much of it is used again for oil extraction by solvent methods, producing about 6 percent of industrial quality oil.

In addition to the above-mentioned direct forms of return, olive production entails two other profound advantages. Firstly, it should be emphasized that olives are grown mostly on land in Class III and IV, most of which, by definition, is not fit for other forms of agriculture (except grazing). Secondly, olive culture draws on forms of labour which have very low opportunity cost, such as old family members, women, children and the spare time of owners. Consequently, it could be argued that olives use with reasonable efficiency substantial quantities of land and labour inputs, and at little or no expense to other patterns of farming.

Consumption and exports

Olives are consumed as pickles or pressed for oil. It is estimated that 85% of the olive crop goes into oil extraction and the rest is pickled (usually about 6,000 tons). Olive oil, and to a lesser extent olive pickles, are two important staple foods in the West Bank.

Domestic consumption of olive oil is estimated at about 8,000 tons per year i.e. roughly the equivalent of 30,000 tons of olive fruits. Locally produced oil is handled mostly in tins of 17 kilograms each. Consumption habits vary widely from urban to rural communities. According to a recent study, per capita consumption in large towns ranges from 2 to 4 kilograms per annum, whereas it reaches over 15 kgs in small villages.[1]

The lower olive oil consumption in urban areas is attributed to their extensive use of other types of oil (mostly seed oils) and samneh - a local brand of cooking margarine. The trend toward partial substitution of olive oil with seed oils is gaining increasing ground even in rural communities themselves, mainly because of price difference. This is a very important point to consider when evaluating the future prospects of olive culture.

With local demand for olives (oil and pickles) in the range of 34 - 38 thousand tons, and in view of available production figures, it is clear that much of the olive crop is consumed in the West Bank itself. Occasionally there may be deficits which

1. S Nasser, Palestine Olives, (West Bank: Birzeit University, 1979, p 28).

are met through stocks carried from previous years or imports from Spain and Greece. According to an FAO olive expert, the trend towards local consumption of oil products is a typical feature of all oil producing countries. He further notes that exporting oil is merely a process of interchanging market needs among producer - consumers.[1]

The main export market for olive oil and pickles is Jordan, where some of it is re-exported to the Gulf states. There they are consumed mainly by Palestinian residents. Some quantities, though considerably smaller are sold in the Gaza Strip. In general, exports fluctuate violently from one year to another, in direct response to yield fluctuations. Except in off-seasons, the value of olive exports (oil and pickles) may exceed one fifth of all West Bank exports, although compared with citrus, olive culture is not as significant in export trade. Table (VII-4) shows that although occupying an area of only 25,000 donums (3.7 percent of the area under olives) citrus exports have, on the average, substantially exceeded those of olives.

1. O F Marsico, Olive Cultivation in the Countries of the Mediterranean Basin and the Near East, (Rome: FAO Publication No TA 3159, 1974), p 2.

Table (VII - 4)

Exports to Jordan of Olives and Citrus

	1976	1977	1978	1979	1980	Average
Olive oil						
- tons	4275	n.a	4586	2164	6527	4388
- value (IL mill)	57.9	23.1	209.8	145.7	1084.7	304.2
Olive pickles						
- tons	2200	--	1609	837	2143	1702.3
- value (IL mill)	15.2	--	30.9	24.2	132.8	40.6
Olives - total value	73.1	23.1	240.7	169.9	1217.5	344.8
Citrus						
- tons	n.a	n.a	44400	35300	29000	36200
- value (IL mill)	62.8	143.8	213.6	217.8	381.4	203.9

Source: Administered Territories Statistics Quarterly, op cit, relevant volumes for respective years.

Cultural practices

The olive tree is a highly versatile plant which can be grown with varied results under extremely diversified conditions, whether in terms of topography, climate, soil type, or amount of precipitation. It is a long-lived tree which takes 7 - 10 years to commence commercial production. Until recently the establishment of a new plantation was hampered by slow and inefficient propagation technologies. In the late seventies, however, there was a major technological breakthrough following the introduction of forced-rooted cuttings by the use of growth stimulating hormones. There are three local nurseries using the new technique which, combined together, produce around 0.6 million seedlings a year. About 180-210 thousand seedlings are sold on the West Bank and the rest are exported to Jordan, Israel (exclusively to Arab farmers), and the Gaza Strip.

Olives are grown mainly on marginal land in classes III and IV. Although most old orchards were neatly terraced a long time ago, new plantations are currently preceded by only minimal land development practices, obviously because of exorbitant cost of land development.

New orchards require light pruning and occasional ploughing, once or twice a year, mainly to eliminate weeds. Although they manage to survive through the baking sun of long rainless summers, newly planted seedlings can grow much faster if they are irrigated two or three times during the summer months for 2-4 years after they are planted. Nearby cisterns can play an important role in this regard.

Mature orchards receive very different levels of husbandry. Ploughing is considered by most farmers and conventional technicians as the backbone of cultural practices. Due to a notably rough topography, ploughing is done almost entirely by animals. A minimum of two ploughings is recommended by extention agents, mainly to eliminate weeds and preserve soil moisture. However, due to the very high cost of ploughing it is estimated that about one third of olive growers plough their orchards only once a year.[1] The possibility of replacing one or two ploughings with chemical weed killers, as we shall see later, offers a great potential for reducing ploughing costs.

Fertilization and manuring of olive orchards is rarely practiced.

1. S Nasser, op cit, p 39.

A recent study has revealed that only 14 percent of farmers add manure and chemical fertilizers to their orchards. And despite strong (though inadequately tested) extension recommendations advocating excessive fertilizer use, it was found that 76 percent of olive growers did not even believe that fertilization is useful.[1] The researcher has encountered enough emprical evidence to justify farmers' reservations.

Manuring, on the other hand, is recognized as very useful by farmers and extension agents. But due to its rising cost (mainly the cost of hauling it to distant locations), its use has sharply declined.

Pruning of olive trees is considered by technicians and farmers as the most important single practice needed by olives, especially in older orchards. Annual corrective pruning, usually quite mild, is done by owners during the picking season. But there is an urgent need for wide-scale rejuvenation pruning in many growing areas, particularly in northern districts.

Insect and disease control is not practiced, despite the incidence of many pests. This point will be elaborated further under the section on production problems.

The picking season starts in October and extends for 2-3 months. Because of the small size of the fruit, olive picking is an extremely labour-intensive operation. About two thirds of olive growers pick their orchards themselves. This is usually performed

1. Ibid, p 41.

by all members of the family, with only minimal use of hired labour. But landlords with inadequate labour supply resort to leasing their orchards during the picking season to tenants, who are paid in kind by taking one third of the olive crop.

After the crop is picked some of it, usually the better fruits, are selected for making pickles. It is estimated that about 6000 tons are used in pickling, and the rest go for oil extraction (often over 80 percent of the crop). Pressing of olives is done by machines which vary considerably in efficiency. Practically all olive presses charge against their services in kind, usually by deducting 9 - 11 percent of the olive or oil output. Oil extraction rate varies from 22 - 32 percent of the pressed fruits depending, among other factors on the quality of pressing machines, and on the average it falls around 26 percent. The resulting oil is bottled in tin cans of 17 kg capacity.

Profitability situation

More than any other type of agriculture, evaluation of olive profitability in the West Bank setting is riddled with complications which render such a process difficult. There are so many variations in production techniques that it would be practically impossible to give really accurate figures for profitability which take into consideration all attributes bearing on costs and returns of olive farming. In lieu of a comprehensive study which takes all variables into consideration, this research has attempted to ascertain the profitability of olives in just the dominant patterns of olive culture. Sampled farmers were selected from major production areas as follows: Tulkarm 9, Jenin 4, Nablus 7, and Ramallah 5. Very small orchards of below 3 donums were

excluded from the sample, since their economic parameters are too diversified to quantify in such a non-specialized profitability study. The results of this study are summarized in Table (VI-5).

The vast majority of olive farmers have inherited orchards which are too old (at least from owners' points of view) to justify worrying about rearing costs, because such costs have been long amortized. Furthermore, olive farmers find it meaningless to talk about fixed costs arising from interest on fixed investment (mainly the market price of orchard land) for two main reasons. Firstly, they are unwilling to consider selling their land even for the sake of better investment opportunities. Secondly, the kind of land grown with olives is usually so marginal that it is often worthless to convert it to an alternative type of farming. In areas where conversion is viable, farmers do not hesitate to make the shift.

A similar argument applies to labour. Being a typically labour-intensive tree, much of the olive's labour needs are mobilized from family members who command a negligible opportunity cost. Again, this is another item of costs which farmers would not take into account when ascertaining olive profitability. When family members sell their services in the local market (eg. a ploughman ploughing his orchard), then it is deceiving to ignore ploughing costs, because they are real enough, though not paid out of a farmer's pocket.

The cost of picking poses different problems. On about 30% of all olive orchards picking and pressing is undertaken by tenants against a share of one third of the olive oil output. In this case owners are exempted of all picking expenses.

Table (VII - 5)

Profitability of olives

	Unit	JD/unit	Good year		Bad year	
			Quantity	Value (JD)	Quantity	Value (JD)
Cost outlay						
a. Labour (total)	Donum	9.7		11.4		8.5
Animal ploughing	man-day	3.3	2	6.6	2	6.6
Pruning	"	2.4	1/3	0.8	1/3	0.8
Fertilization	"	-	-	-	-	-
Spraying	"	-	-	-	-	-
Picking	"	2.4	1/3	0.8	1/8	0.3
Picking	woman/day	1.6	2	3.2	0.5	0.8
b. Materials (total)		-	-	-	-	-
Fertilizer & manure	kg	-	-	-	-	-
Pesticides	kg	-	-	-	-	-
c. Interest on investment	% per year	10	1/3	0.2	1/3	0.3
TOTAL COST, of which:				11.6		8.8
- value of unpaid labour				3.0		0.8
Returns - total						
Quantity of output	kg		150			20
Oil extraction	%		25			27
Less 10% for pressing	kg		3.7			0.5
Oil output	kg		37.5			5.4
Returns to owner	JD	0.85	33.8	25.3	4.9	4.2
Plus returns from by-products	JD			1.5		0.5
TOTAL RETURNS TO OWNER				26.8		4.7
NET RETURNS:						
- family labour included				15.2		4.1
- family labour excluded				18.2		-3.3

Analysis of the results given in Table VII-5 points to the following conclusions:

1. Olive production is remunerative to owner-operators in good years and makes a slight loss in bad years, given the existing frame of operations where it utilizes inputs which have a minimal opportunity cost and where the amount of paid expenses is kept to a bare minimum.

2. Ploughing is the most important cost item, amounting to more than 50 percent of total costs. Consequently, profitability will be materially increased if it becomes possible to reduce the number of ploughings to one, or even do away with it completely.

3. The cost of picking is the second most important item, and it ranges from 12 percent of total costs in a bad year to 30 percent in a good year. The cost of picking is considerably greater for owners who relegate picking to tenants, usually against a share of one third of total output. Should there be some means(such as hormone spraying) to modernize picking and cut down its cost, that will be materially helpful in raising profitability of olives in the present setting of West Bank agriculture.

4. Profitability of new orchards where pre-maturity development costs cannot be ignored, is more marginal and it depends largely on the following conditions:-

   a. Land development costs have to be reduced essentially by maintaining development operations to the bare minimum.

   b. Farmers should aim at a much higher productivity.

   c. The bulk of labour input should continue to come from sources with a negligible alternative opportunity cost.

Problems

Olive production is hampered by a wide range of technical, economic, and political problems. The most serious result of these problems is the steady and marked decline in profitability of olives. In this section we shall identify major problems and evaluate their impact on the future of olive growing in the West Bank.

a. Economic problems

1. High cost of labour. Being a notably labour-intensive crop, the profitability of olives has declined markedly with the sharp rise in wages over the past 14 years. Wages have risen, at fixed prices, by five times since 1966, whereas the price of olive oil has just doubled during the same period.

   Labour is needed most intensively in picking, and to a lesser extent in ploughing. Spraying with picking hormones saves much on labour, but their use is still very limited due to inadequate field testing of the new technology. Undoubtedly, the prospects are promising. Likewise, ploughing costs can be reduced by wider dissemination of weed killers and by the introduction of small tractors which can reach large numbers of olive orchards.

2. Rough topography, excessive rockiness, and erratic rainfall. The consequences of these physical constraints are profound and very difficult to cope with. Mechanization is rendered extremely difficult, transportation is expensive, and the potential for technological change is limited. While much can be done to solve these problems, the researcher does not advocate restricting olive culture only to areas where land is ideal. The only limitations in this regard are rainfall and the possibility of putting land under more

intensive forms of cultivation, if topography permits or irrigation water is available.

3. Growing competition with imported seed oils. The West Bank imports substantial quantities of seed oils, mainly of sunflower, soya and corn, the reason being their low price relative to olive oil. Prices of seed oils in world markets fall in the range of US $ 670 - 700 for the price of olive oil.[1]

   Although seed oils are not consumed fresh, many families, particularly in urban communities, are using them for cooking purposes instead of the much more expensive olive oil. Evidently, this is an international trend which is gaining momentum in almost all olive producing countries. For instance, aggregate olive oil consumption in major producing countries during 1961 - 71 remained almost steady, while the consumption of vegetable oils rose by 125 percent.[2] It should be noted, on the other hand, that the substitution of olive oil with cheaper oils is much slower in rural than in urban communities, despite an attractive price differential.

   The rationale of this argument is that the prospects of increasing olive oil sales in urban communities are not promising - unless the price of olive oil becomes more competitive, which in turn is unlikely in the foreseeable future, whereas increased consumption by producing families is certainly possible - should these families manage to

1. D F Marsico, op cit, p 2.
2. Ibid, p 3.

produce more of it themselves.

4. Competition with imported olive oil. Although no detailed statistics are available, the West Bank consumes large quantities of imported olive oil, mostly from Spain and Greece. Imported oil is cheaper by around 10 - 25 percent and bottled in small-size containers. Its quality, as viewed by local residents, does not match with local oil although it may be considered superior in some export markets. Cheapness of European olive oil is due to higher productivity which is rendered possible by growing olives on land which permits intensive production techniques.

5. Small size and extensive dispersion of holdings. This has gradually reduced the interest on the side of owners and has made collective action in cultural practices (eg. pest control) difficult. Likewise, it is very difficult to reach many growers in order to extend to them financial support or credit facilities.

6. Unsatisfactory processing and marketing techniques. Most olives are still pressed in relatively old machinery, thus loosing precious oil in the pulp (even over 5 percent). As oil is bottled in tin cans of 17 kgs on these machines, it is difficult to purchase oil in smaller quantities. Quality is not standardized and is inadequately controlled. Occasional but widely publicized cases of adulteration have badly damaged the export potential of local oil.

7. High cost of fertilizers and chemical sprays. Fertilizing olive trees undoubtedly helps increase productivity and the

question is only one of how much of what fertilizers to add. Likewise, it may be essential to use chemical sprays for the control of certain pests. The most serious constraint in both cases is the high cost of needed inputs. It is very difficult to promote their wider use on olives in the present economic setting without a partial subsidy on their prices.

b. Political Problems

Conforming with their land policies, Israeli authorities display little approval for olive culture. Although there is not yet suppression of olives cultivation, official caution is apparent in the attitude and policies of the Department of Agriculture. Recently, for example, the Military Administration instituted new measures which aimed at curtailing large-scale expansion in olive groves by demanding licences from producing nurseries[1] (possibly closing some of them) and by insisting on prior approval for distribution of subsidized seedlings by voluntary agencies. The Military Administration even asked for detailed lists of recipient farmers and locations of planting.[2] Furthermore, the Department of Agriculture stopped, from the early 1970s, previous efforts aimed at collective control of chronic olive pests. No credit facilities are provided to olive growers and the flow of funds from foreign sources is carefully controlled.

c. Technical Problems

1. Incidence of chronic pests. The most important olive pests

1. Interview with the Chief Horticulturist in the Department of Agriculture, November 5, 1981.

2. Voluntary agencies have so far refused to do that. Reference: an interview with the Director of the Community Development Foundation, March 5, 1981.

in the West Bank are: Olive fruit fly (Daucus olea), Twig borer (Thomisiniana oleisuga), Peacock eye spot (Cycloconium oleaginum) and Lichens (parasitic plants).

The damage inflicted by these pests is certainly significant, but the magnitude of the damage probably does not exceed, on the average, 15 percent of the crop.[1] This, in addition to the high cost of chemical sprays, has discouraged farmers from displaying active interest in the control of olive pests.

2. Intensity of weed infestations. Following early showers in November and December weeds grow rapidly and intensely, thus competing with olives for scarce moisture and nutrients. Controlling weeds by ploughing is expensive. Chemical control has been effective and considerably cheaper, and over half of respondent farmers expressed their desire to try the new technology, if such a service could be made available through contract spraying companies.

Grapes

Grapes are indigenous to Palestine and there is ample evidence of their prevalence during the Roman occupation, about two thousand years ago. At the present, however, commercial grape production is restricted largely to southern districts (Hebron, Bethlehem), but grapes are still second only to olives on the list of rainfed trees.

Area and distribution

According to most recent data the West Bank grows around 87,000

1. Assessed from estimates of specialist extension agents.

donums of vineyard with a total annual production of around 46,000 tons (see Table VII-6). The largest concentration of vineyards is in Hebron district, which accounts for about two thirds of area and output, followed by Bethlehem with a share of 20%. In fact vineyards are concentrated largely on a stretch extending between the two cities of Bethlehem and Hebron, which produces 87% of West Bank grapes. Produce of other districts is consumed mostly by farm households and has very little commercial value. There are many indications (such as widespread prevalence of ancient wineries) to suggest extensive cultivation of grapes in most parts of the West Bank until several decades ago.

Table (VII - 6)

Area and production of grapes by district (1980)

District	Area (donum)	Yield (kg/don)	Output (tons)
Total	87,353	521	45,557
Hebron	55,376	550	30,456
Bethlehem	17,820	500	8,910
Jerusalem	270	500	135
Ramallah	7,290	500	3,745
Jericho	61	2000	122
Nablus	1,500	300	450
Tulkarm	1,536	400	614
Jenin	3,500	350	1,225

Source: Piles of district offices of the Department of Agriculture.

The decline of vineyards in northern districts is worth special attention, as it comes despite abundant labour and land resources. This phenomenon could be attributed to three major factors:

a. Occasional outbreaks of Phylloxera which eventually destroyed vineyards in infested localities.

b. Low yields caused by severe pest infections of powdery mildew and grape fruit fly. This problem has been particularly severe in the coastal areas because of high temperature and humidity.

c. Profitability of grapes in coastal areas has been due to low productivity and competition with grapes produced early in the season and under irrigation on Israeli farms, whereas the impact of Israeli produce on the late maturity grapes of Hebron hills is negligible.

Economic and nutritional significance

Although the second most important rainfed tree, grapes contribute only 5-7% of the West Bank's gross agricultural product. However, the relative significance of grapes as a source of income goes much beyond that, due to the striking concentration of vineyards in a small area. The results of this study indicate clearly that grape production constitutes the major source of income for most farmers in the grape corridor extending between Hebron and Bethlehem.

Likewise, the localized importance of grapes in the diet of residents in Hebron and Bethlehem districts is high. Besides consuming them fresh as a dessert, large quantities of grapes are consumed in other processed forms which are well known in that part of Palestine (eg. syrup, raisins, and malban*). Grape products thus appear to provide local farm families with carbohydrates during the excessively cold winter months.

* Grape syrup dehydrated into soft sheets.

Consumption and exports

Grapes are consumed mainly fresh as a popular dessert, since only 5 - 10% of local consumption is taken in processed forms. Local consumption varies considerably, depending on production and marketing circumstances. Though not indicative of any negative trend in grape consumption habits, total consumption reportedly dropped from 32,000 tons in 1978 to 24,000 tons in 1979.[1] This was due to high prices of table grapes induced by vigorous exports to Jordan. In most years, however, local markets absorb 40-50% of total output.

Surplus West Bank grapes are exported to Jordan, the Gaza Strip, and Israel. All of these countries are producers of grapes, but Hebron grapes enjoy certain comparative advantages. Jordan is deficient in domestic supply while Israel produces mostly early to mid-season grapes, half of which go into wineries. Likewise, the Gaza Strip produces early grapes which are consumed early in the season, and then relies on West Bank grapes for several months.

The relative share of the above-mentioned export markets varies considerably from one year to another, depending mainly on protectionist considerations. Counting on the responses of middlemen and leading farmers who were interviewed in this survey, the crop of 1980 was channelled as follows:

West Bank	45%
Jordan	12%
Gaza Strip	17%
Israel	26%

Cultural practices

Like olives, grapes are not too exacting in their climatic and soil

1. Administered Territories Statistics Quarterly 1980, op cit, p 102, and 1979, vol 2, p 98.

requirements. Therefore they are grown successfully on a wide range of soils and topography, whether rainfed or under irrigation. As such, it is considered in principle a tree of considerable potential in the West Bank physical setting.

Though they have much in common, there are still important agronomic differences between grapes and olives, most importantly the following:

a. Vineyards come to commercial bearing much earlier after initial planting (three years versus eight).

b. They are also much less vulnerable to climatic abberrations and do not display significant variations in output to any extent comparable with that of olives. This gives important economic advantages to grape producers.

c. Grapes are much easier to propagate, since that is done by direct growing of cuttings taken during the growing season.

d. Grapes are much more susceptible to insects and diseases than olives, and if inadequately protected, pest damage may go close to 100%.

A fundamental pre-requisite for establishing a commercial vineyard in the Hebron hills is reclamation of desired land. This involves removing bedrocks and constructing gently sloping terraces by building retaining stone walls. This process has become very expensive, and the cost of development per donum is estimated at JD125 (see Table VII-7). The breakdown of this cost, however, reveals that about 90% of it goes to manual labour, mostly contributed by farm families themselves. However, there is still ample room for reducing the cost of land reclamation by providing machine services at more competive prices. As we shall argue in a later section, there is a strong case for subsidizing the costs of land development.

Table (VII - 7)

Development costs of vineyards land

(JD per donum - Spring 1981)

	Unit	Price	No of units	Total cost
Bulldozers	Hour	7.1	3	21.3
Removing Stones	Day	3.3	4	13.3
Wall construction	$Meter^3$	2.2	40	88.0
Levelling (by tractor)	Hour	1.8	1	1.8
Total				124.4

Source: Farmers sampled during the course of this study.

After the land is prepared, vines are grown by direct planting of cuttings taken from desired varieties in the pruning season. The vineyard takes 3-4 years before it starts commercial production. In the meantime the farmer has to provide such basic services as weed elimination (by repeated animal-ploughing) and pest control. The farmer also has to decide on the method of rearing his vines, which could be one of three: creeping, standing by poles, or trellised on elevated wire frames.

Trellising of vineyards entails significant advantages to growers. By virtue of more efficient cultural practices, productivity of vineyards increases by more than three-fold as compared with the traditional creeping method.

There are only around 5000 donums of trellised vines at present (about 4 percent of the total area). The only important constraint for a more extensive expansion of trellising is its high initial construction costs, estimated at JD 130. If this problem is effectively solved, then this is likely to accelerate trellising on a much larger scale.

A productive vineyard requires much labour in the form of ploughing (twice a year), pruning, pest control, and picking. As in olive culture, most of the labour input is furnished "free" by members of farm families whose opportunity cost is low. But unlike olives, family heads play a more active role in managing their vineyards, since that is more justified from a profitability point of view.

Profitability situation

Due to the minimal commercial value of grapes grown in other districts, this study of profitability was restricted to vineyards in Bethlehem/Hebron grape corridor. The sample consisted of 15 farmers, 10 from Hebron district and 5 from Bethlehem. Due to marked differences in costs and returns of all three methods of grape cultivation, their profitability has been individually ascertained (7 creeping, 5 standing, 3 trellised). The results are summarized in Table (VII-8).

Unlike olives, land development costs of vineyards are too recent to ignore. Out-of-pocket cost items incurred in land development were added to pre-maturity costs and amortized on the life span of the vineyard.

Table (VII - 8)

Profitability of grapes

	Unit	Trellised			Standing			Creeping		
		JD/unit	Quantity	Value JD	JD/unit	Quantity	Value JD	JD/unit	Quantity	Value JD
Variable costs				48.6			34.25			30.25
a. Labour - total				34.3			24.9 ·			21.0
Ploughing	don	3.33	3	10.0	3.33	3	10.0	3.33	3	10.0
Pruning	man/day	3.00	1.5	4.5	3.00	1	3.0	3.0	2/3	2.0
Fertilization	"	1.60	1	1.6	1.6	2/3	1.1	1.6	2/3	1.10
Spraying	"	3.00	1	3.0	3.0	2/3	2.0	3.0	2/3	2.00
Thinning leaves	"	1.60	2	3.2	1.6	1	1.6	1.6	2/3	1.10
Picking & packing	"	(2.40	1	2.4	2.4	2/3	1.6	2.4	1/2	0.80
		(1.60	6	9.6	1.6	3.5	5.6	1.6	2.5	4.00
b. Materials - total				12.8			8.25			8.25
Fertilizers	kg	0.08	60	4.8	0.08	40	3.20	0.08	40	3.20
Pesticides				8.0			5.05			5.05
Sulfer	kg	0.17	25	4.25	0.17	15	2.55	0.17	15	2.55
Rolidol	litre	5.00	0.75	3.75	5.00	0.5	2.50	5.00	1/2	2.50
c. Interest	%	10	1/3 year	1.5			1.1			1.0
Amortized Foundation costs				9.0			3.6			2.5
PRODUCTION COSTS - total				57.60			37.85			32.75
Marketing costs - total				28.00			15.40			7.12
Transportation	per ton	1.5	2	3.0	1.5	1.14	1.70	1.5	0.75	1.12
Commission	%	10	250	25.0	10	137	13.70	10	60	6.00
Boxes - provided free by commission agents										
TOTAL COSTS				85.60			41.45			33.25
TOTAL RETURNS	ton	125	2	250.0	120.0	1.144	137.0	80.0	0.75	60.0
NET RETURNS										
- family labour included				164.4			95.5			24.7
family labour excluded				193.4			112.5			48.7

Discussion of results:

The following conclusions regarding profitability of grapes can be drawn from data presented in the previous section:

1. Grapes are among the most profitable crops in rainfed agriculture. Comparing their net returns with those of olives, which are often less than JD 10 per donum, grapes are far more profitable.

2. The share of unpaid family labour amounts to 35% of total costs in trellised vineyards, 26% in standing vines, and 56% in creeping plantations. It is clear that trellised vineyards are sufficiently remunerative even if served entirely by hired labour.

3. Trellised vineyards are far more profitable than creeping ones, with standing vines falling midway between the other two (see previous data). It is apparent, in fact, that trellised vineyards are as capital and labour intensive as most irrigated patterns of agriculture and no less profitable.

Problems

a. Problems related to production

Grape producers in Hebron/Bethlehem have acquired a marked degree of expertise in this pattern of farming. Available data on grape productivity in that area suggest that farmers have achieved superior yields, given existing physical and capital constraints. Damage caused by such chronic pests as powdery mildew (Untinula necator) and the grape fruit fly (Polychrosis botrana) is kept to a minimum through efficient control measures. On the other hand, it is precisely these pests which constitute the major problem in vineyards of northern districts, where infestation is more acute due to higher temperature and humidity. Despite attempted control measures, those pests are still virulent and they

inflict heavy damage, even exceeding 70% of expected yields.

Commercial grape production in the south is confronted with a number of problems bearing on production, marketing, and supporting services. These problems are summarized below:

1. Inadequate credit facilities. It was noted earlier that reclamation of land and construction of trellises require large capital outlays, much beyond the means of most farmers. Efforts to subsidize part of the needed capital, as being currently practiced by the CDF*, have been warmly received by farmers.

2. Variety problems. The indigenous variety, Dabouki, is used in about 80 percent of the vineyard area. Though highly productive and notably sweet, Dabouki fruits are excessively soft and deteriorate rapidly when stored or shipped, even for short distances. This imposes a rigid constraint on their marketing potential.

3. Phylloxera hazards. This microscopic insect is a serious menace to vineyards and it wiped out extensive areas in the thirties and early fifties. After a prolonged absence, it was diagnosed recently in an area of 2000 donums in Bethlehem district. Although its dissemination is relatively slow, the risk is still great due to the lack of resistent root stocks and to the unavailability of effective control measures.

4. High cost of production inputs. This applies to such purchased inputs as fertilizer and insecticides, as well as hired labour. Fertilizer is usually added at less than half of recommended rates. Problems of labour are further aggravated by the lack of appropriate machinery and scarcity of custom service units.

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* Community Development Foundation.

5. Poor agricultural roads. Roads connecting vineyards with neighbouring villages are commonly narrow and too rocky to permit truck or tractor accessibility. This increases cultivation costs and seriously impairs the quality of fruits while they are en route to destination markets.

6. Lack of irrigation water. Unlike Israel, West Bank vineyards are practically all rainfed. Although it may slightly impair quality, irrigation of vineyards helps raise productivity by over 60%. This suggests that it may be economically sound to promote irrigated grapes in West Bank areas where water is available. The researcher learnt from Israeli farmers in the Jordan Valley and coastal areas that early maturing grapes constitute a lucrative source of income which compares favourably with other forms of intensive farming.

b. Problems related to marketing:

In addition to the chronic problems associated with marketing of perishable farm produce, exporting of locally-produced grapes is faced with difficulties arising mainly from the weakened bargaining position of the West Bank in setting the terms of trade with Israel and Jordan. The following is a summary of major grape marketing problems:

1. Problems of middlemen. Commission charged by middlemen often exceeds 10%, and sale procedures are sometimes insufficiently competitive, to the disadvantage of producers. As typical of agricultural marketing at large, channelling of produce through middlemen poses serious problems which are very difficult to solve, more so in the absence of a national authority.

2. Poor auxiliary services. Packaging is still poor, whether in regard to types of boxes used (wooden and too large) or cheating

when filling boxes by placing superior fruits at the top and poorer ones below. Cold storage facilities are not available, although their service would help materially in evening variations in supply and demand. Processing of excess produce into other products, (such as syrup, jam, juice and malban,)is performed by using primitive equipment, which in turn reflects on the quality of products and their market potential. The local wine industry is severely hampered by religious inhibitions, although its potential is certainly large due to the suitability of the local variety of grape.

3. Unsatisfactory terms of trade with Israel and Jordan. Israel restricts the flow of West Bank grapes by quotas and permits entry only late in the season after its own produce is disposed of. Most recently, exporters to Israel have been asked to pay a royalty of about JD 4 per ton to the Israeli Fruit Marketing Board, in order to safeguard against a potential drop in returns earned by Israeli producers.

The flow of grapes into Jordan, on the other hand, involves too many routine complications, which are both time and money-consuming. This reflects badly on the market potential for a perishable commodity such as grapes. In particular, "security inspection" procedures on both sides of the frontier bridge over the Jordan cause a lot of undue delay and damage.

Almonds

The almond is the third most important rainfed tree in the West Bank. Although generally less important in the economic life than olives and grapes, almonds are gaining increasing significance, both in terms of area and contribution to farm income.

Area and distribution

As in the case of olives and grapes, almonds are grown in all districts, except the Jordan Valley. According to sources in the Department of Agriculture there were (in 1980) 75430 donums of almonds which produced 1074 tons (see Table VII-9).

Table (VII - 9)

Area and production of almonds by district (1980)

District	Area(donums)	Yield (Kg/don)	Output (tons)
Total	75430	14.2	795.2
Hebron	4578	16	73.2
Bethlehem	1254	16	20.1
Jerusalem	770	20	15.4
Ramallah	7396	20	147.9
Jericho	-	-	-
Nablus	15500	2	31.0
Tulkarm	21797	10	218.0
Jenin	24135	12	289.6

Source: Files of district offices of the Department of Agriculture.

The data indicate an obvious concentration of almonds in northern districts, particularly in Jenin and Tulkarm, where more than half of all almonds are grown. It should be noted, however, that there is nothing special about those districts as far as almond growing is concerned, since almonds can be grown with almost equal success in most other districts.

Almond acreage and output have witnessed violent fluctuations in recent years, as indicated in Table (VII-10). This is

underlied by two major phenomena, namely, marked variations in yield and occasional uprooting of extensive almond orchards.

Table (VII - 10)

Recent trends in acreage and output

(1978 - 80)

	Area (donums)	Yield (kg/donum)	Output (tons)
1978	76953	101	7749
1979	64184	74	4773
1980	75430	14	795

Source: Files of the Department of Agriculture.

Yield variations are attributed mainly to the almond's pronounced susceptibility to sharp weather variations, which quite often coincide with the blossoming season in February. Hail storms and strong winds, both are common at that time of the year, may inflict drastic damage on sensitive almond blossoms, and possibly reverse what could have been a promising season. In this regard almonds are as vulnerable as olives, while grapes are less susceptible to such weather variations than either.

Variations in area reflect another distinctive feature of almond culture, namely its relatively brief period of bearing. Large areas are added annually simply by direct sowing of almond seeds. On the other hand many orchards are pulled out for such reasons as heavy insect damage or conversion to other more remunerative kinds of trees through grafting (mainly to plums).

Economic and nutritional significance

Almonds are versatile in terms of their forms of consumption. Some (or all) of the crop can be picked green, 2-3 weeks after flowers

set. At this stage almonds are consumed fresh as a seasonal delicacy. Several weeks afterwards, the fruits pass through another edible stage when they can be picked half solid and sold at high prices in Amman markets. Most of the crop, however, is usually left to dry out, and then picked in mid-summer. After they are picked almond fruits are dressed of their wilting green cover, and then either stored as dry fruits or further shelled of their stone cover and stored as dry almond seeds.

It is difficult to project accurately the percentage of almonds consumed in the forms described above, since this depends largely on unpredictable market variations. But according to sampled farmers and technicians the distribution in most years is roughly as follows: 25 percent of the crop is picked green, 10 percent half-solid, and 65 percent in the solid stage.

Almond seeds are consumed fresh or toasted in brine water. But the bulk of dry seeds is used in making certain forms of popular sweets and confectionary.

Bitter almonds constitute around 10 percent of almonds in production. Their fruits are not fit for eating purposes, but they are also in strong demand, though at much lower prices than sweet varieties. They are channelled almost totally into Israel where they are used in the pharmaceutical industry.

According to official data, almonds contribute some 5-10 percent of gross agricultural income. While this is little less than the share of grapes, it is certainly considerably lower than that of olive and citrus.

However, despite their rather modest quantitative contribution, almonds could potentially play an important role in West Bank agriculture. This will be explored later in this section.

Consumption and exports

Although a fairly popular food item, the almond is not consumed in quantities comparable to those of olives or grapes. In the first place it is not considered as a staple food. Furthermore, almond prices have soared to a point where producers are tempted to turn more produce into the market, at the expense of home consumption. Due to its pronounced output variations, almond consumption varies widely from one year to another. According to respondents' estimates the quantity consumed locally (of dry almonds) is in the neighbourhood of 50 tons, ie. about one third of total output.

Almonds, in all their edible forms, are considered as basically export commodities. About 80 percent of green and half-solid almonds are exported to Jordan. Shelled almond seeds, on the other hand, have a wider export potential. About half of the exported produce goes to Jordan (and Syria) and the other half goes to Israel which, according to informed business sources, re-exports much of it to Cyprus and possibly thereafter to some Arab countries.

The flow of shelled almond seeds into Jordan (and hence to other Arab markets) has frequently been obstructed by problems arising from boycott regulations. Jordan was formerly reluctant to permit the entry of any almond seeds shelled in Israeli mills, which stimulated the establishment of the first West Bank almond shelling mill in 1977. Even now, it is suspected that some of Israel's much larger almond supply might be smuggled into Jordanian markets under a West Bank label.

Cultural practices

Almond trees resemble olives and grapes in being as versatile in their topographic and climatic requirements. In fact almonds are even less vulnerable to rockiness, steep slope, occasional droughts, and soil shallowness than olives and grapes, because they have the distinctive feature of a deeper root system. As such, almonds are particularly suitable in areas where land quality is poor, even for growing olives or grapes. This, however, comes at the cost of a much lower productivity in comparison with orchards grown on land with better quality or under irrigation.

West Bank farmers grow almonds by direct sowing of seeds from bitter or solid sweet varieties. Land reclamation prior to sowing is rarely practiced (a sharp contrast to Hebron vineyards). Emerging seedlings are either left to grow as they are, or grafted two years later with buds from the soft-shelled "Farek" variety. The new tree begins commercial production in about 2 - 3 years.

Mature orchards can thrive with minimal levels of husbandry, but again at the cost of lower productivity. It has been found that the vast majority of farmers do little other than ploughing of their orchards once or twice a year. Pruning is rare, as is pest control or fertilizer use.

An important feature of the almond tree, as mentioned earlier, is its brief productive life span, mostly in the range of 12 - 16 years. This is in sharp contrast to olives, but somewhat comparable to grapes. However, it is noticed that longevity of bitter and hard-shelled varieties is much longer than that of the soft-shelled farek. This, as we shall see later, is due mostly to the susceptibility of soft-shelled varieties to certain virulent insects common in the area.

Because of the relatively short life span of almonds they are commonly interplanted with olives for as long as they are too small to occupy their allotted land. Growers are encouraged to do so by the wide spacing of olive orchards (around 8 - 10 meters apart) and the farmers' drive to exploit their land more productively during the interim pre-maturity period. Almond trees will thus be uprooted in 7-8 years to give space to olives.

In principle, interplanting olives with almonds is certainly well justified on economic grounds, but in most areas this procedure has been practiced wrongly by leaving almonds too long in the orchard, hence causing severe damage to olives. With a deeper root system, almond trees compete more aggressively for scarce moisture and nutrients available in an already marginal soil. Consequently, olive trees remain stunted and fail to give a good crop, thus giving growers a further justification (though basically false) for maintaining almonds.

Profitability situation

As in the case of olives, profitability of almonds varies considerably as a result of pronounced fluctuations in output, which makes it very difficult to talk about an "average" yield. Ascertaining profitability is further compounded by the multiplicity of end products and non-systematic patterns of picking (green, half-solid, solid). The forthcoming analysis assumes that the entire crop is picked in the solid stage.

Table (VII-11) contains a summary of costs and returns per donum of productive almonds (10-12 years old). The figures cited below apply to the soft-shelled Farek variety. Comparison of net returns with bitter and hard-shelled almonds is summarized at the

Table (VII - 11)

Profitability of almonds

	Unit	JD/unit	Good year		Bad year	
			Quantity	Value JD	Quantity	Value JD
Cost outlay						
a. Amortized Foundation costs	donum	1.3	1	1.3	1	1.3
b. Labour - total				10.9		6.6
Animal ploughing	donum	4.5	1	4.5	1	4.5
Pruning	man/day	-	-	-	-	-
Fertilization	"	-	-	-	-	-
Spraying	"	-	-	-	-	-
Picking	woman/day	1.6	3	4.8	1	1.6
Preliminary shelling	"	1.6	1	1.6		0.5
c. Materials - total		-	-	-	-	-
Fertilizer, manure		-	-	-	-	-
Pesticides		-	-	-	-	-
d. Interest	%	10	1/3 year	0.4	1/3	0.2
e. Hauling of produce				0.9		0.3
TOTAL COSTS				13.5		8.4
RETURNS - total	Kg	(N.B.)	60	37.8	15	10.5
NET RETURNS						
- family labour included				24.3		2.1
- family labour excluded				28.3		4.2

N.B. In a good year: JD 0.63 per kilogram.
In a bad year: JD 0.70 per kilogram.

end of this section. Land development practices prior to growing almonds are miminal, because farmers believe that this tree can grow reasonably well irrespective of land quality. The cost of bringing the orchard into bearing age has been amortized over 14 years, which is the average life span of Farek trees.

Discussion of results:

1. Almonds are fairly profitable, despite the low level of husbandry they are accorded at present. Counting on the prevailing incidence of one good year in a series of three, net profit is estimated at about JD 10 per donum. Given the quality of land put under almonds, mostly class IV, it is doubtful if available substitutes (olives or almonds) would provide a higher income.
2. Comparative analysis of profitability for Farek, hard-shelled and bitter varieties have revealed interesting facts, notably the following:
   a. Yield is much higher for bitter almonds, followed by hard-shelled Farek (ratio 3:2.5:1).
   b. Bitter almonds are more consistent in their productivity. They are also much more resistent to almond wasp - the chief enemy of almonds.

      Consequently, the life span of bitter almonds is much higher than that of Farek, with hard-shelled varieties falling in between.
   c. The price of Farek is the highest, followed by hard-shelled and bitter varieties (ratio: 4.8:1.4:1).
3. On the whole, Farek almonds can be thought of as a kind of a cash crop which nets fairly high profits over a short period

(about 10 years). Bitter and hard-shelled almonds net less but they survive longer and under conditions which Farek almonds cannot tolerate for long.

4. Comparative profitability, however, is influenced heavily by rapid changes in the price structure. If bitter almonds were to stop reaching industrial firms in Israel and Europe, possibly for some political reason, their prices would sink sharply to a non-viable level. Likewise, if Jordan received less imported Farek almonds, then the price of West Bank Fareks would soar to where it was prior to the opening of Israeli markets, about one third higher than current prices.

Problems

1. Insect damage. West Bank almond orchards are infested with several insects, some of which are so serious that they inflict heavy losses in produce and can result ultimately in the eradication of extensive plantations. Most serious of these pests are:

a. Almond wasp (Eurytoma amygdali)

This insect attacks soft fruits causing their wilting and eventual mummification. Due to a shortage of labour, farmers tend to leave mummified fruits (which contain dormant larvae) hanging on trees, which causes a wider dissemination of infection in subsequent seasons. The loss in yield can increase rapidly until it exceeds 50 percent of ordinary yield. Farek and other soft-shelled varieties are particularly susceptible to this insect, while bitter almonds are much less so. The best and most effective control measure is the collection and destruction of infested mummies. But the effectiveness of this practice depends largely on the collectiveness of control within a certain geographic area.

West Bank farmers are doing little in this regard.

b. Pear slug (Caliroa cerasi)

This insect infests almond leaves and it starts sucking their sap until attacked leaves are virtually desiccated. Infestation appears early in the summer, and by the end of it infested orchards look as though they are burnt. So far this insect is confined largely to the region of Anabta (Tulkarm district), but it certainly poses a major hazard to all other almond producing regions in the north West Bank. This insect can be effectively controlled by using systemic chemical sprays (ie. those which infiltrate into the trees' sap). Though relatively cheap and effective, the success of this measure depends largely on collective action. This is hampered by the lack of powerful spraying equipment and the poor technical aptitude of most almond growers. Such a situation might be improved by the introduction of modern spraying units which are able to render their services to farmers in the area against a reasonable charge.

2. Poor cultural practices. As mentioned earlier, the level of fertilizer use, pest control, and soil tillage is strikingly poor. Although there is a low ceiling on the amount of inputs which could be used feasibly when almonds are grown on very poor quality land, there is still room for fundamental improvements. An important step is the complete substitution of ploughing by chemical weed killers. This has been demonstrated as equally effective in controlling weeds, while being much cheaper than mule-ploughing. The use of fertilizers should also be actively advocated, though at rates much less than that recommended by extension agents, whose recommendations

are tailored essentially for intensive almond production, possibly under irrigation.

Modest fertilizer use and proper application of weed killers, coupled with effective insect control schemes is likely to raise productivity and reduce seasonal variations in production.

3. Poor marketing structure. There are several loop-holes in the present marketing structure of almonds. The following problems were voiced by most sampled respondents:

   a. The almond trade with Jordan and Israel is dominated by a few middlemen who are in a position to earn a substantial margin, much higher than that commensurate with their services. Loosening this cartel is a great step towards giving producers a fair share of almonds' sale price.

   b. Marketing of West Bank almonds in Amman faces several problems. Besides constraints resulting from elaborate permit procurement procedures, local produce suffers even more from competition with almonds imported from such countries as the United States and Cyprus. By virtue of a much higher productivity, these countries are easily able to undercut West Bank prices. As the almond is a luxury good consumed by higher income strata which are not too sensitive to possible price rises, and since almond growing affects classes of Palestinian peasants which are most vulnerable to Israeli economic policies, it is politically reasonable to seek more stringent measures on almond imports into Jordan from foreign countries. This argument carries further weight in view of widely held suspicions that much of Jordan's imported almonds come in fact from Israel, via a third country.

Other trees

The discussion has so far covered olives, grapes and almonds, which are by far the most important of all common rainfed trees with regard to their area and share in agricultural income. However, there are many other kinds of trees which, though currently of minor significance, may possess large potential under different circumstances. The following is a brief review of the most common of these trees, with emphasis on their comparative profitability, problems, and prospects for the future. The data on areas and output is derived from the files of district offices of the Department of Agriculture and from the Agricultural Atlas of Jordan. Profitability estimates are derived from a 1979 study published by the Economic Planning Unit in the Department of Agriculture.

1. Plums

   Total area is estimated at 32,275 donums (1980) versus 14,230 donums in 1966. Production has also increased in the same period from 3,770 to 18650 tons.[1] More than two-thirds of all plum orchards are grown in Hebron and Ramallah districts.

   Plum production expanded rapidly in the seventies, mainly in the upper hills of Hebron and Ramallah districts. The main reason for that was the high returns earned from exports to Israel. But most recently it has been noticed that local supply, particularly of early maturing varieties, has exceeded demand which hence led to a sharp drop in prices and profitability. A 1979 study of profitability has shown differences among late and early varieties. While the former netted JD 42.5 per donum, the latter netted only JD 39.1.[2]

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1. Agricultural Atlas of Jordan, op cit, p 116.
2. The Economics of Common Farming Enterprises, op cit, p 6.

In 1981 the difference was even much more pronounced.

Plum trees are accorded a relatively advanced level of cultural practice, comparable to that of grapes. The main problem which faces producers, other than price, is pest damage. Plum trees are susceptible to stem borers and root rot (Armillaria mellea). The extent of damage, however, is much lower than similar hazards on almonds, figs, or apricots.

Expanding plum culture is certainly desirable but there are important prerequisites. More varieties should be introduced, with emphasis on early and late maturing ones. Pricing should be stabilized through cooperative organisations which should bargain for better prices in Israeli and Jordanian markets. The establishment of processing outfits which are able to absorb part of the surplus produce would be a great step forward. This, however, is not an unqualified proposal to establish a processing factory, since that requires a more elaborate study.

2. Figs

The total area is estimated (1980) at 2871 donums, as compared to 25,822 donums in 1966. Similarly, production is reported to have dropped during the same period from 13,855 to 11,000 (tons).[1]

The fig tree was until two decades ago a major tree in such areas as Ramallah and Nablus districts. Most of the fig produce was sold fresh, and the rest was processed into a local dessert called Kottain (dried figs). In certain parts

1. For 1966 figures: Agricultural Atlas of Jordan, op cit, p 112.

of Ramallah district figs were until three decades ago almost as significant as olives, whether in terms of area or importance in the local economy.

Fig production commenced a steady decline in the Middle sixties following widespread infestation with two very serious insects, namely, the stem borer (Batocera rufonaculata) and fig scaly insect (Ceroplastes rusci). As common with all rainfed fruit trees, no control measures were practiced, although the latter insect is fairly easy to control. The main problem was the lack of equipment and expertise. Infestation with fig scales spread steadily until it now covers over 90 percent of all West Bank figs. But fortunately, the trees themselves die at a slow rate and before death they can be easily rejuvenated with the proper remedial measures.

Profitability of figs is not easy to ascertain, due to their widespread inter-farming with other types of trees. According to the Department of Agriculture, net returns per donum are estimated at JD 15.9.[1] It is emphasized, however, that returns could be more than doubled if productivity is increased by providing better care for existing orchards.

Fig fruits are soft, which makes them excessively perishable under improper transportation and storage. With the problems of marketing across the frontier bridges so complex and time-consuming as they are, exports to Amman offer little potential should there be a surplus. Israeli markets, on the other hand, are able to absorb all fig surpluses and at attractive prices.

1. The Economics of Common Farming Enterprises, op cit, p 9.

Therefore, there is a strong case for rejuvenating fig plantations and expanding production. Besides the present constraints of insect hazards, fig culture would be materially accelerated if seedlings of desirable varieties could be made available on a sufficiently large scale. Furthermore, there is ample room for modernizing and expanding fig processing of surplus produce into Kottain.

3. Apricots

Total area is estimated at 4,737 donums (1980), versus 4,201 donums in 1966. Production has risen during the same period from 1,287 to 1,376 tons.[1]

Apricot culture is concentrated largely in Tulkarm district which accounts for about half of the total area. But the most common observation in this regard is the rapid decline in its production in recent years. Less than three decades ago the area under apricots was more than three times larger. The main problem which faces this tree and causes its eventual extermination is infection with chronic pests. Apricot trees are infested with a stem borer (Capnodis carbonaria) which is difficult to control and ultimately causes total destruction of infested orchards. Due to inherent weaknesses in extension services and apparent negligence by farmers due to the availability of more attractive sources of income (eg. employment in Israel), the Capnodis hazard is spreading rapidly and it threatens apricot orchards with total destruction.

1. For 1966 figures: Agricultural Atlas of Jordan, op cit, p 120.

Apricots are consumed fresh, and one of the local varieties (Baladi) is extremely perishable, while the other (Hamawi) is much less so. Exporting of Hamawi to Amman is allowed and its quality permits doing so, whereas the Baladi is too perishable.

Profitability of apricots is estimated at JD 45.6 per donum,[1] which is higher than all other types of rainfed fruit trees - except for trellised grapes. Expanded production is not only possible but strongly recommended, provided more emphasis is placed on Hamawi to facilitate exports. But the major problem, again, is insect and disease damage. Should there be a problem of surpluses over fresh consumption, much of the produce could go into processing, now in Israel, but possibly in Palestinian factories at a later stage.

1. Ibid, p 8.

CHAPTER VIII

CHAPTER VIII

ECONOMICS OF RAINFED CROPS AND VEGETABLES

A - Field Crops

Field crops do not occupy a prominent place in West Bank agriculture. This is attributed largely to the scarcity of land fit for low-cost mechanized farming. The area under field crops has further declined, as we discussed earlier, because of the closure and confiscation of large stretches of crop land during the past 14 years. Counting on the average for the last three years, field crops occupied about one third of all cultivated land and contributed around 6 percent of gross agricultural income (see Table VI-5) in Chapter VI).

Field crops are grown in all parts of the West Bank, except in the Jordan Valley where they cannot be rainfed due to insufficient rainfall and it does not pay to grow them under irrigation. Table (VIII-1) shows that one third of all field crops are grown in Hebron district and one fourth in Jenin. Both of these districts have relatively large stretches of fairly level land which are fit for mechanized farming. Likewise, in other districts field grains are grown in hilly slopes or valley bottoms where the slope is sufficiently gentle. The general trend among farmers is to prefer growing grains to fruit trees if the quality of land permits intensive field crop production. The data collected on profitability tends to give credibility to their choice.

Table (VII - 1)

Regional distribution of field crops

(1980)

	Area	
	,000 don	% of total
Total	545.5	100.0
Jenin	134.6	24.7
Tulkarm	65.5	12.0
Nablus	65.4	12.0
Ramallah	52.8	9.7
Jerusalem	7.9	1.4
Jericho	14.0	2.6
Bethlehem	32.3	5.9
Hebron	173.0	31.7

Source: Files of the Department of Agriculture.

Field crops grown on the West Bank include a wide range of cereal grains, legumes, and fodder crops. Table (VII-2) shows the average area, output, and share in the gross farm product of all major crops.

Table (VII - 2)

Area, output and share in gross agricultural income of major field crops

(Average for 1977, 78, 79).

	Area		Output	
	,000 don	% of total	,000 tons	% of total
Total-field crops	528.4	100.0	85.9	100.0
Wheat	222.1	42.0	32.4	37.7
Barley	172.1	32.6	28.9	33.6
Lentils	38.3	7.2	2.5	2.9
Chickpeas	17.8	3.4	1.6	1.9
Vetch	37.5	7.1	2.8	3.3
Others	40.6	7.7	17.7	20.6

Share in agricultural income - percentage*: 6.2% of gross income.

Sources: Files of the Department of Agriculture.
For income, refer to Table (VI-5).

The figures in the previous table indicate that wheat is the most important field crop, both in terms of area and output. Barley comes next in importance, occupying about one third of all the area under field crops. In this section we will provide a commodity analysis of wheat, barley, lentils and chickpeas.

Wheat

Area and distribution

According to the latest data (1980), the West Bank grows 230 thousand donums which produce around 39 thousand tons (see Table VIII-3). About 45 percent of all the area is grown in Hebron and Jenin districts.

The area under wheat has undergone a sharp decline under occupation (see section on changes in output). The area in 1966 was estimated

* Detailed income data is not available.

at 419,358 donums producing 29,733 tons.[1] The drop in cultivated area, however, has been accompanied by a noticeable increase in productivity rising from 72 to 162 kilograms per donum.

Wheat production is far more significant in Israel and Jordan; the former is estimated to have produced 169,000 tons (in 1978) and the latter 53,300 tons.[2]

Table (VII - 3)

Area, yield, and total output of wheat

(1980)

District	Area (don)	Yield (kg/don)	Output (,000 tons)
Total	230,516	168	38,733
Jenin	47,220	200	9,444
Tulkarm	36,355	170	6,180
Nablus	35,380	170	6,015
Ramallah	33,415	180	6,015
Jerusalem	1,500	95	142
Jericho	8,230	330	2,716
Bethlehem	13,255	150	1,988
Hebron	55,161	113	6,233

Source: Files of the Department of Agriculture.

Economic and nutritional significance

According to data available from official sources, the share of wheat in gross agricultural income is estimated at 3.1 percent (1980)[3]. This shows that the relative weight of this crop in West Bank agriculture is quite modest, particularly in comparison

1. Agricultural Atlas of Jordan, op cit, p 138.
2. Statistical Abstract of Israel, 1979, p 9, and Agricultural Statistical Yearbook of Jordan, 1979, p 57.
3. Administered Territories Statistics Quarterly 1980, Vol 1-2, p 102.

with other types of rainfed agriculture, such as major types of fruit trees. But due to the pronounced concentration of wheat farming in certain parts of Hebron and Jenin (24% and 20% of output, respectively), it is in fact very important at the local level in those areas.

Wheat is consumed mainly in the form of bread. According to the food balance sheet of 1979, wheat products contribute 47 percent of all caloric per capita intake, 52 percent of proteins, and 8 percent of fats.[1] The corresponding ratios in Israel are 34 and 4 percent.[2] This is a clear indication of the critical importance of wheat in the local diet. In fact bread is by far the most important single food item in the West Bank, and it may be so as well in other parts of the Middle East. It should be emphasized, however, that increased consumption of bread is due more to the much higher prices of other complimentary of alternative food items (eg. meat and rice) rather than to the choice of consumers. Improvements in the standard of living, especially in urban areas, have been accompanied by a sharp decline in per capita consumption of bread.

Consumption and exports

The annual consumption of wheat flour is estimated (for 1980) at 85,100 tons, i.e. 123.7 kilograms per capita, as compared to 100.4 in Israel.[3] This means that the West Bank produces less than half of its wheat supply, and the rest is imported, currently from

1. Ibid, p 102.
2. Statistical Abstract of Israel 1980, op cit, p 280.
3. Ibid, p 102 in the Quarterly and p 279 in the Abstract.

Israel. In fact, much of the wheat produced locally is sold in Israel itself where a floor price is guaranteed to producers. Consequently, West Bank markets derive from Israeli mills more than two thirds of the flour they sell in local markets.

The problem of excessive dependence on imports for such a vital commodity as flour constitutes a major challenge not only to the West Bank, but to the Arab World at large. A recent study has revealed that Arab countries import about 40 - 50 percent of their aggregate wheat demand, and that their "wheat gap" rose from 10 million tons in 1975 to 13.6 million tons in 1980.[1] According to the same study, it is estimated that these countries import about 10 percent of all wheat traded in international channels, although their share of world population does not exceed 4 percent. Being one of the least endowed with arable land resources, the West Bank is not expected to make substantial progress towards bridging its own wheat deficit.

Cultural practices

Wheat is produced under extremely diversified levels of cultural practice. In areas where it is grown on relatively steep terraces, peasants use traditional inputs and techniques, and their produce goes almost totally into family consumption. But in areas of intensive production, where land is reasonably level, farmers have acquired an advanced level of technology which compares well with that in Israel and Jordan. There is, however, ample room for improvement.

1. Ibrahim Abdullah, The main pivots of the process of socio-economic development in the Arab World during the coming two decades 1980-2000, (Kuwait: The Arab Planning Institute, 1980) p 5.

Seed sown by farmers is procured in the open market, since the Department of Agriculture sells less than 5 percent of the required seed stock. Seed sold by the Department is certified for productivity, quality, and cleanliness from foreign seed and seed-borne diseases, whereas seed procured from other sources is not adequately certified in those regards. Varieties are all of solid strains, most common of which are Anber, 870 and 304.

Seed-bed preparation is performed mostly by modern machinery. This is facilitated by the presence of custom machine services in Jenin and Hebron districts. Sowing follows mostly the early showers of November and early December. The erratic pattern of rain distribution may cause serious problems to producers. A particularly serious hazard is sudden and prolonged drought following seed emergence.

Late in winter, farmers begin their campaign against weeds. In the vast majority of commercial fields this is accomplished by using chemical weed killers, whereas on smaller plots weeding is done manually using female labour. By late May the harvest season begins, and it continues through to the end of June. On smaller fields, and where land is too steep, farmers still use sickles for this purpose. Threshing in this case is accomplished by stationary machines driven by tractor power-belts. In areas of commercial grain production, farmers use modern combines which simultaneously do the threshing and harvesting.

Productivity of wheat (and other field crops) has improved during recent years. In areas of sub-commercial production, it may not have shown a significant increase, since it continues to hover

around 70 kilograms per donum. On the other hand, the yield in Jenin district has risen to over 250 kilograms per donum, due to the adoption of better production techniques and relatively ample fertilizer use. Although a sudden and substantial rise in productivity in hilly areas is not anticipated, there is room for improving productivity even under those conditions, should there be an adequate supply of auxiliary services.

Profitability

Profitability of wheat production was ascertained on the basis of a sample of 10 farmers representing all major producing districts, (Jenin 5, Hebron 3, Ramallah 2). All sampled respondents had at the time a minimum area of 7 donums. Although mechanization levels varied from one sampled farm to another, none of them was of the strictly peasant type using conventional labour-intensive techniques on tiny hilly plots. The results of this study are summarized in Table (VIII-5).

Table (VII - 4)

Profitability of Wheat

	Unit	unit	Quant.	Value JD	Value Fils
Cost outlay:					
a. Land rent	Donum	10.00	1	10	000
b. Production inputs - total				5	100
seeds	kg	0.10	12	1	200
fertilizer - total				3	700
super-phosphate	"	0.040	35	1	400
ammonium sulphate	"	0.050	30	1	500
urea	"	0.080	10		800
weedkiller	Litre	1.000	0.2		200
sacks	Number	0.250	2	-	500
c. Labour & machine services - total				6	300
ploughing	Donum	0.800	1		800
discing	"	0.300	1		300
drilling	"	0.800	1		800
spraying	"	0.500	1		500
harvesting	"	1.900	1	1	900
hauling of produce					200
baling	Bale	0.120	15	1	800
d. Interest on investment	%	10	1/4		500
TOTAL COST				22	300
Returns:					
wheat seeds	kg	0.090	300	27	000
straw	"	0.008		2	400
TOTAL RETURNS				29	400
NET RETURNS				7	100

Discussion of results:

1. Commercial wheat production is evidently profitable, given its high productivity and open sale opportunities in Israel.

2. Profitability varies considerably with the amount of rainfall. The situation as reported in the previous data is representative of an average good year. According to sampled farmers and technicians, the frequency of good crops is around two out of three. But in "off-years" profitability declines sharply and producers may even encounter a real loss.

3. Free family labour plays a minimal role in commercial wheat farming, since it is markedly mechanized. But in many other parts of the country where wheat farming is still labour-intensive, productivity is low, and family labour is a crucial factor in the context of declining profitability.

4. Local demand for wheat as such is much too low to absorb all produce, due to rapidly changing consumption habits in favour of milled flour. Surplus produce is marketed in Israel at subsidized prices.

Barley

Area and distribution

The area under barley (1980) is estimated at 184 thousand donums producing 26.8 thousand tons. Table (VIII-5) shows that about one third of all barley is produced in Jenin district. Hebron is the next highest with a share of 22 percent in output and 42 percent in area, which is a marked indication of low productivity. It should be noted that the same districts rank also top in the size of their livestock herds.

Table (VIII - 5)

Area, yield and output of barley

(1980)

District	Area (,000 don)	Yield (kg/don)	Output (,000 tons)
Total	184.0	145	26.7
Jenin	42.5	190	8.1
Tulkarm	16.2	200	3.2
Nablus	17.4	200	2.5
Ramallah	11.8	200	2.3
Jerusalem	3.0	80	0.2
Jericho	5.4	330	1.8
Bethlehem	10.2	160	1.6
Hebron	77.5	116	6.0

Source: Files of the Department of Agriculture.

Economic and nutritional significance

In aggregate terms, barley is not a relatively important crop in the present context of West Bankagriculture. Its share in the gross agricultural income is less than 2 percent (wheat's share is only 3 percent). But the auxiliary role of barley as the major feed item for fairly large flocks of sheep, goats and draught animals which are kept by many farmers is very important indeed. The production of "cheap" grains with minimal out-of-pocket costs makes it possible to sustain livestock under what seem to be non-viable patterns of production. And as barley is produced mostly on marginal land not suitable for wheat, an expansion in its production would help boost the livestock industry and make use of inferior land resources.

Barley is the most important cattle feed on the West Bank. Grains are used extensively in feeding cattle, sheep and goats. Straw is

also a very important by-product. It is usually shredded during threshing to produce what is called tibin, which is considered by livestock owners as a major item in their feed inventory, and they are keen to stock it in adequate quantities for later use.

Cultural practices

Barley is very similar to wheat in the cultural practices used in its production. This includes seedbed preparation, weed and pest control and harvesting. It should be noted, however, that barley is grown on a wider range of lands and under lower amounts of rainfall. In those cases where it is grown under marginal conditions it is intended as a fodder crop, and in that case its yield of straw may sometimes be more valuable to producers than the meagre amount of grains produced.

The most common varieties are Root and No 50, and both have been shown to be appropriate to local conditions.

Profitability

It was found that the cost outlays and returns from wheat and barley were very similar. No major differences in profitability are discerned by sampled farmers, although the market structure for both crops do show some differences.

Chickpeas

Area and distribution

The chickpeas is a legume crop which, though grown in a relatively small area, is considered by farmers in certain areas as a major crop. The area under chickpeas (1980) is estimated at 13.8 thousand donums which produced 1228 tons (see Table VIII-6). About 60 percent of all output is produced in Jenin district.

Table (VIII - 6)

Area, yield and total output of chickpeas

1980

District	Area (don)	Yield (kg/don)	Output (tons)
Total	13,761	89	1,224
Jenin	7,473	100	747
Tulkarm	460	85	39
Nablus	1,390	65	90
Ramallah	927	85	79
Jerusalem	2,000	100	200
Jericho	16	120	2
Bethlehem	490	60	29
Hebron	1,005	47	42

Source: Files of the Department of Agriculture.

Consumption and nutritional significance

The chickpeas is a locally consumed commodity. Practically none of it is exported, either to Jordan (which produces four times as much) or to Israel. In fact, local production sometimes falls short of demand, and the deficit is bridged by imports.

Chickpeas are consumed in the West Bank (and in all other parts of the Middle East) in the form of three local types of food: falafel, hommous, and kdameh. Falafel and homous are very popular dishes, the former being a cheap sandwich meal, and the latter is a basic breakfast item. Kdameh is prepared by mixing chickpea seeds in brine and then toasting them to dry. It is used widely, together with other types of dry nuts, as a leisure food.

Cultural practices

In the major production area of Jenin, chickpeas are produced on land of class I or II, using modern techniques, quite atypical

of rainfed farming in the West Bank. Ploughing, drilling, weed control, and harvesting is performed mostly by modern machinery, which are available widely through custom service units. On farms where family labour is abundant, some of the production operations are performed manually, mostly by women and children.

Profitability

Table (VII-7) summarizes the results of a profitability study conducted on a sample of five farmers. Respondent farmers were all selected from the Jenin districtwhich was by far the most important producer of market-oriented chickpeas. The sample constituted around 7 percent of all producers in that district with over 5 donums each.

Table (VIII - 7)

Profitability of Chickpeas

	Unit	JD per	Quant.	Value	
				JD	Fils
Cost outlay:					
a. Land rent	Donum	100.000	1	10	-
b. Production inputs - total				4	690
seeds (s. phosphate)	kg	0.240	11	2	640
fertilizer (s. phosphate)	"	0.040	30	1	200
pesticides	Donum	0.600	1		600
jute sacs	no	0.250	1		250
c. Labour & machine service - total				7	410
ploughing	Donum	1.00	1	1	-
discing	"	0.500	1		500
seed drilling	"	0.500	1		500
fertilizer spreading	"	0.200	1		200
spraying	"	0.300	1		300
pulling out the crop	Women/days	1.200	1.8	2	160
threshing	Hour	5.200	1/4	1	300
hauling of produce	Men/days	3.00	1/4		750
other expenses					700
d. Interest on investment	%	10	4 mnths		700
TOTAL COST				22	800
RETURNS:					
seeds	kg	0.200	120	24	-
straw	"	0.050	50	2	500
TOTAL RETURNS				26	500
NET RETURNS				3	700

Discussion of results:

Chickpea production in Jenin district is profitable, even if conducted on a strictly commercial basis, ie. paying at market rates for all production inputs and services. In reality, however, the margin of profit is even wider. A large part of the labour input is provided free by members of farm families, who usually possess little or no real opportunity cost.

Table (VII-7) shows that the cost of land rent accounts for about 45 percent of all cost outlay. While this makes out-of-pocket loss for owner-cultivators less likely it means, on the other hand, that tenant-cultivators must run their farms with considerable efficiency if they are to make a profit.

Profitability of chickpeas, it should be noted, is closely related to variations in market prices. This point will be elaborated in the next section.

Problems

Production problems are fairly well controlled, and farmers appear to be constantly improving their productivity. The extensive presence of service machinery units in Jenin district has expedited the process of modernizing production practices. This process has been accentuated by the very close proximity of Palestinian and Israeli farms lying on both sides of the Green Line (pre-1967 frontier).

The real problem, however, relates to marketing. The market price of produce during the harvest season may drop in good years to a non-profitable level. The problem is aggravated by the free entry of chickpeas imported from Israel and Bulgaria - the former

producing under a system of heavy subsidies, the latter anxious to earn foreign currencies. While the West Bank continues under occupation there is little hope of altering such terms of trade. Nevertheless, a lot could and should be done even within present constraints, such as the introduction of more efficient practices, collective purchase of inputs, and processing of a part of the produce in food industries.

Lentils

Area and distribution

This is the most important human-edible legume on the West Bank. The area under lentils (1980) is estimated at 35.2 thousand donums with a production of 1849 tons (see Tavle VIII-8). About half of all output is produced in Hebron district and about one third in Jenin.

Table (VIII - 8)

Area, yield, and total output of lentils (1980)

District	Area (don)	Yield (kg/don)	Output (tons)
Total	35,186	52	1849
Jenin	10,554	50	528
Tulkarm	2,036	40	82
Nablus	2,210	60	133
Ramallah	1,870	40	70
Jerusalem	250	100	25
Jericho	-	-	-
Bethlehem	2,401	35	84
Hebron	15,975	58	927

Source: Files of the Department of Agriculture.

Consumption and nutritional significance

The lentil is a very popular local food item. It is cooked in various forms, mainly as soup or majaddarah. In rural communities, the lentil constitutes a staple food, and because of its rich protein content (28 percent), it is described locally as the "poor-man's meat". It could indeed be so in the light of the excessive rise in the price of meats.

All domestic produce of lentils is consumed locally. In fact there is a constant deficit in supply which is met by imports from Jordan. There is no reliable data available in this regard, but about 3 percent of all imports from Jordan are classified as "pulses", which consist largely of lentils, and probably some chickpeas.

Cultural practices

These are broadly the same as for chickpeas, except that lentil production is less mechanized.

Profitability

Profitability of production was ascertained on the basis of a sample of five farms, all located in Jenin and Hebron districts which produce more than 80 percent of all marketable lentils. Respondent farmers were selected from a total population of 150 farmers each cultivating over 4 donums. Sampled farms were representative of major production areas in both districts. Table (VIII-9) contains a summary of results. It is clear that lentils are markedly more profitable than chickpeas. But as they are more labour-intensive, lentil culture is more suitable for areas where topography is relatively rough.

Table (VIII - 9)

Profitability of lentils

	Unit	Price JD/unit	Quant.	Value	
				JD	Fils
Cost outlay					
a. Land rent	Donum	10.00	1	10	-
b. Production inputs - total				3	570
seeds	kg	0.220	12	2	640
fertilizers					
insecticides	Donum	0.600	1		600
jute sacs	No.	0.330	1		330
c. Labour & machine service - total			9		380
ploughing	Donum	1.000	1	1	-
discing	"	0.500	1		500
seed drilling	"	0.500	1		500
spraying	"	0.300	1		300
pulling out	Women/days	1.200	3	3	600
threshing	Hour	1.480	1	1	480
hauling of produce	Man/days	3.000	1/4		750
other expenses				1	250
d. Interest on investment	%	10	4 months		750
TOTAL COST				23	700
Returns:					
seeds	kg	0.42	60	25	200
straw	"	0.07	130	9	100
TOTAL RETURNS				34	300
NET RETURNS				10	600

B. Vegetable Crops

The rainfed production of vegetables is, relatively, the least important of all patterns of West Bank agriculture. This is well illustrated in Table (VIII-10), which shows that the total area under vegetables (1980) is estimated at 110,000 donums, ie. about one fifth of the area under field crops and only 13 percent of the area under fruit trees. About 57 percent of all vegetable areas are rainfed, and the rest is irrigated. But the relative share of the former in produce is much lower than that of irrigated vegetables, often around one fourth of total vegetable produce.

Table (VIII - 10)

Area and total production of vegetables (1966, 1980)

(Area in thousand donums and output in thousand tons)

	Irrigated		Rainfed		Total	
	dons	tons	dons	tons	dons	tons
Total - 1966	93.1*	112.7	142.6	57.4	235.7	170.1
Total - 1980	47.1	143.0	62.5	49.7	109.6	192.72
Major crops (1980):						
Tomato	8.9	35.7	13.0	10.1	21.9	45.8
Cucumber	9.0	18.7	-	-	9.0	18.7
Potato	4.2	5.9	0.8	0.6	5.0	6.5
Melons**	1.4	3.0	13.8	14.6	15.2	17.6
Squash	5.2	10.1	5.5	3.3	10.7	13.4
Snakecucumber	-	-	5.9	3.6	5.9	3.6
Okra	0.4	0.03	5.1	2.3	5.1	2.3
Onions (dry)	0.2	0.5	8.7	8.4	8.9	8.9
Onions (seeds)	0.017	0.017	3.7	0.087	3.9	0.104

* Includes irrigated and non-irrigated winter crops.

** Includes cantaloupes and watermelons.

Sources: Files of the Department of Agriculture.
Agricultural Atlas of Jordan, op cit,

Table (VIII-10) reveals also that there has been a substantial drop in the area and output of vegetable crops in the post-occupation era. This can be explained in the light of the following changes:

1. The sharply reduced availability of non-marketable family labour.
2. Abundant supply of vegetables at reasonable prices, throughout most of the year.
3. Closure of extensive land areas, some of which were used prior to occupation for growing vegetables and field crops.

Production of vegetables under dry farming conditions is necessarily restricted to those areas which receive adequate rainfall in the rainy season. Consequently, no such crops are grown on the eastern slopes, the Jordan Valley, or the south eastern hills of Hebron district. According to the data for 1980 (see Table VIII-11), it is noticed that about half of all rainfed vegetable crops are grown in Jenin district, which combines the advantages of mild topography and above-average rainfall. Hebron district comes next, producing tomatoes and squash.

Table (VIII - 11)

Regional distribution of rainfed vegetable crops

(1980)

	Area	
	,000 don	% of total
Total	62,577	100.0
Jenin	27,893	44.6
Tulkarm	5,932	9.5
Nablus	4,832	7.7
Ramallah	7,126	11.4
Jerusalem		
Jericho	-	-
Bethlehem	3,699	5.9
Hebron	13,905	20.9

According to available reference data, there is a large number of vegetable crops which are grown currently in the West Bank. But four of these (tomato, onions, melons, and okra) account for about 70 percent of all the area under rainfed production. The remaining 30 percent is distributed in tiny shares among more than 12 types of vegetables.

The vast proportion of rainfed vegetables (mainly tomatoes, okra, and snakecucumber) are produced in a peasant type of farming which is almost totally family-oriented, whether in regard to the source of mobilized labour or consumption of produce. A major share of the produce is consumed by the farm family, and the rest is sold to neighbours or in village markets. Furthermore, most of these crops are grown in an intercropping pattern in olive or young grape orchards. Obviously, the profitability of this kind of agriculture is very difficult to ascertain meaningfully.

Notwithstanding the peasant nature of rainfed vegetable production, there are a few types of vegetable crops which are grown on a full-fledged commercial scale. Most significant of these are melons (cantaloupes and watermelons), which will be discussed in the next section.

Melons and cantaloupe

The West Bank was an important producer of melons prior to Israeli occupation in 1967. According to available data the area under watermelon and cantaloupe during the period 1963-66 averaged at 75,000 donums producing 75,200 tons.[1] About 95 percent of all

1. See sections on change in acreage and output, Chapter VI.

watermelon output was produced in Jenin district under rainfed conditions. Local produce not only met the needs of domestic markets but much of it was exported to Jordan.

In the wake of Israeli occupation, melon culture dropped to very low levels for reasons discussed earlier (see sections on changes in area and output). In the latter seventies, however, farmers in Jenin district discovered new opportunities by producing melons using modern intensive techniques. The new technology spread so rapidly that output of watermelon rose again though to levels still lower than those of pre-occupation. Table (VIII-12) shows trends in area and output for watermelon and cantaloupe during the past three years.

Table (VIII - 12)

Area and output of melons

	1978		1979		1980	
	Donums	Tons	Donums	Tons	Donums	Tons
Watermelon	815	548	6,217	10,400	11,353	12,800
Cantaloupe	6,975	3,079	3,515	3,400	3,883	4,728
Total	14,790	12,627	9,732	13,800	15,236	17,528

Source: Files of the Department of Agriculture.

Economic significance

Based on national estimates melons do not have a prominent role in West Bank agriculture. Their average share in gross farm income during the past three years is calculated at 0.5 percent.[1] But viewed on a regional basis, melon culture is very important

1. Derived from Administered Territories Statistics Quarterly 1980, Op cit, p 89.

for farmers in the northern parts of Jenin district.

About one half of the melon produce is consumed in local markets, mostly substituting imports from Israel, and the rest is exported to Jordan several weeks before melon plantations commence commercial production there. West Bank melons thus enjoy an important comparative advantage and could reap the benefits of a sizeable export market. This provides an attractive opportunity for local farmers, provided that more attention is given to regulating the flow of melons to Jordan (see problems below).

Cultural practices

Melon culture in Jenin district is one of the most capital and technology intensive forms of agriculture in the West Bank. Seedbed preparation is very thorough and is carried out by modern machinery. Seeds are of a high quality and of a certified origin. After planting the soil is covered with polyethylene sheets in order to preserve soil moisture during later hot months. Fertilization and pest control measures are practiced regularly and with a great care. The extensive availability of custom machine service units in the area has facilitated the acquisition of modern technology on a wide scale, even on small farms.

Profitability

Table (VIII-13) summarizes the results of the profitability study conducted on cantaloupe growing in Jenin district. The results are based on data collected from a sample of ten producers, and they were further checked with extension specialists in the Department of Agriculture.

It was not possible to conduct a profitability study for melons

Table (VIII - 13)

Profitability of cantaloupes

Details	Unit	JD per	Quant.	Value JD	Fils
Cost outlay:					
a. Land rent	Donum	10.1	1	10	-
b. Production inputs - total				37	400
Seeds	Grams	0.1	60	6	-
Fertilizer-phosphate	kg	0.065	30	1	950
- ammonium sulfate	kg	0.050	30	1	500
Plastic sheets	kg	0.030	15	-	450
Pesticides (misce aneous)				2	500
Wood boxes	Number	0.25	100	25	-
c. Labour and machine service - total				30	600
Ploughing	Donum	1.0	1	1	-
Discing	-	0.5	4	2	-
Seed drilling	-	0.8	1	-	800
Fertilization	-	0.8	1	-	800
Spraying	-	1.3	1	1	300
Spreading of nylon	-	1.8	1	1	700
Post-emergence discing	-	1.0	2	1	700
Labour - male	Men/days	3.0	2	9	-
- female	Women/days	1.5	8	12	-
d. Interest on investment	%	10	4 mths	1	-
TOTAL COST				79	-
RETURNS - total	kg	0.070	1500	105	-
NET RETURNS				26	-

but according to data collected in 1981 relative to the 1980 season, melon producers also netted a profit of about JD 26 per donum (see Table VIII-3).

Profitability of melons, however, varies so widely even within the same season that it becomes almost impossible to talk about a reasonably stable profit margin. Within a brief picking season of less than five weeks prices of Jenin cantaloupe in Amman market declined from JFils 250 to JFils 30 per kilogram.

Problems

Using highly advanced technologies, melon producers in Jenin district face no serious problems in their production operations. On the other hand, they do face problems related to marketing and prices.

In the domestic market, producers have to compete with Israeli produce, which enjoys certain forms of subsidy. Furthermore, there are rigid restrictions on the flow of West Bank melons into Israel.

Marketing problems are more severe in regard to shipment to Jordan. Wooden boxes are not permitted to be returned from Jordan by the Israelis, which entails a significant expense to producers. Cost of transportation is very high due to monopolies enjoyed by truck owners permitted to cross the frontier bridges. Lack of cold storage facilities deprives producers of any flexibility to extend the marketing season for more than a few weeks, which otherwise could well help stabilize prices.

CHAPTER IX

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ECONOMICS OF LIVESTOCK AND POULTRY

Livestock production has not for many years been a flourishing sector in West Bank agriculture. This is a fundamental problem which has been precipitated by several factors. Most importantly West Bankers did very little until recently to exploit more efficiently their underground and surface water resources. Accordingly, available land and water were generally used for fruit trees and cash crops. By so doing, livestock raising was restricted largely to those areas which were unfit for other forms of agriculture. During the Jordanian rule, this was not considered a serious problem, because any deficit in the local supply of meat was easily supplemented by imports from Turkey, Syria and Romania and the problem was further eased by a rise in the West Bank's poultry meat production.

The situation of the livestock sector deteriorated further in the wake of Israeli occupation in 1967. As demonstrated below (see Table IX-1) the average number of cows and sheep dropped by 17 and 33 percent respectively during the early years of occupation, in comparison to the base period of 1964-66, and then later dropped by 30 and 57 percent during the period of 1977-79. The reasons for this decline will be investigated in this section.

Table (IX - 1)

Secular changes in the number of livestock - in thousands

	Av. for base	1969-72		1977-79	
	period 64-66	Number	% change	Number	% change
Sheep & goats	651.3	434.2	-33	398.2	-39
Cows	34.6	28.6	-17	15.0	-57

(Extracted from Table VI-3, chapter VI).

The livestock sector includes poultry (broiler and egg production), sheep, goats, cows, pigs, honey bees, and fish production. Pigs and honey bees are raised on a very small scale, while no fish at all is produced on the West Bank. Table (IX-2), presents a sectoral breakdown of income from livestock as it was during the four years 1976-79.

Table (IX - 2)

Livestock income, 1976-80

	1976	1977	1978	1979	Average
Gross agr. income (IL mill)	1,535.1	1,734.0	3.756.6	5,674.7	3175.1
Livestock & poultry:					
- Total income (IL mill)	469.1	572.4	914.4	2,104.0	1015.2
- % of agr. income	30.6	33.0	24.3	37.1	32.0
Sectoral distribution:					
Poultry	72.2	80.7	127.7	389.6	167.6
Cows	111.4	149.9	242.4	420.2	321.0
Sheep	173.7	209.3	336.0	804.9	381.0
Goats	103.9	122.6	192.4	463.5	220.6
Others	8.7	9.9	15.9	25.8	15.1

Source: Administered Territories Statistics Quarterly 1980, op cit, p 89.

The data in Table (IX-2) reveals some important features of the West Bank's livestock sector, notably the following:

1. The share of livestock in gross agricultural income varies widely from year to year, partly because of severe variations in gross income, induced mainly by fluctuations in rainfed farming. Furthermore, the said ratio is also influenced by marked variations in the output of individual livestock

sectors. However, it is noted that the annual variation in gross farm output is much more pronounced than that of livestock. This suggests that livestock, in fact, plays a stabilizing role in agricultural income by partly absorbing violent fluctuations in other sectors such as olives. Nevertheless, irrigated agriculture plays a more significant stabilizing role for those farmers engaged in irrigated patterns of farming.

2. On a three years average, sheep account for more than one third of all livestock income (37 percent), followed by cows (32 percent) goats (22 percent) and poultry (17 percent).

3. However, comparing various livestock subsectors on the basis of variations in annual income, it is noted that income from sheep fluctuates most, followed respectively by goats, cows and poultry. This reflects the excessive dependence of sheep and goats on natural pastures, the quality of which varies considerably from year to year, depending on the amount of rainfall.

We shall explore further in this section the economic setting of individual livestock sub-sectors along the same lines as we did for other types of agriculture.

Sheep and goats

Sheep and goats are kept usually by the same farmers and mostly in the same flocks and for the same purposes. Therefore they will be treated together in this section.

Production and income

Sheep and goats are the most important livestock animals on the West Bank. Table (IX-3) shows their geographic distribution in 1980.

Table (IX - 3)

Number of sheep and goats, by district (1980)

	Sheep	Goats	Total
Total	230,617	154,629	385,246
Jenin	24,495	14,375	38,870
Tulkarm	16,449	10,513	26,962
Nablus	48,670	24,790	73,460
Ramallah	25,432	25,995	51,427
Jerusalem	5,600	800	6,400
Jericho	7,500	11,400	18,900
Bethlehem	25,419	14,737	40,156
Hebron	77,052	52,019	129,071

Source: Files of the Department of Agriculture.

The data in Table (IX-3) show that sheep and goats are found in all regions. This is to be expected in view of the abundance of marginal land resources in all districts, which provides livestock owners with natural grazing pastures. However, the above data indicates a marked concentration of both animals in Hebron district, which raises about one third of all the sheep and goat population.

Income from sheep and goats varies considerably from one year to another (see Table IX-2) depending on intensity of rainfall and conditions of pastures. Counting on four years average (1976-79), their combined share of livestock income is estimated at about 60 percent (sheep 38%, goats 22%), and of total agricultural income at 19 percent (derived from Table IX-2). As such they rank next in importance only to olives, being more

significant than every other individual tree or crop. Their relative importance in major production regions (parts of Hebron, Nablus, and Bethlehem) is so high that they constitute the major source of income for large communities, especially of bedouins.

A commodity breakdown of income derived from sheep and goats (see Table IX-4) reveals that 60 percent of it is derived from meat and 40 percent from milk.* This corresponds roughly to the relative importance of both products in the present economic setting.

Table (IX - 4)

Composition of income from sheep and goats, 1979

	Value (IL mill)	Percent of total
Meat, total	758.2	59.8
Sheep	494.2	39.0
Goats	264.6	20.8
Milk, total	510.2	40.2
Sheep	310.7	24.5
Goats	199.5	15.7
Total	1,268.4	100.0

Source: Administered Territories Statistics Quarterly 1980, op cit, p 89.

Consumption and nutritional significance

Sheep and goats constitute the major source of red meat and milk on the West Bank. Table (IX-5) shows that their combined output of meat and milk is more than twice the quantities produced by cows.

* This excludes other secondary returns from wool, hair and manure.

Table (IX - 5)

Meat and milk production, by source (1979)

	Quantity (tons)	Percent of total
Meat (total)	13,700	100.0
Sheep	6,200	45.3
Goats	3,500	25.5
Cows	4,000	29.2
Milk (total)	39,400	100.0
Sheep	14,100	35.8
Goats	10,000	25.4
Cows	15,300	38.8

Source: Administrated Territories Statistics Quarterly 1980, op cit, p 88.

Mutton is the most favoured of all types of meat to local taste. It is closely followed by goat meat, and then by beef. Fish is well-liked but is consumed only on a small scale due to its high price.

During the last decade and because of rigidity in mutton supply and the subsequent rise in its price, the role of sheep as the major source of meat for local consumption has been partly substituted by poultry which, in contrast, has had a much higher elasticity of supply. Not surprisingly, therefore, the ratio of poultry meat produced has risen from one fourth that of red meats in 1968 to 70 percent in 1969 (see Table IX-6).

Despite a noticeable improvement in dietary standards over the past two decades, per capita consumption of meat and milk is still low, and in some places it probably borders on malnutrition limits. Table (IX-6) shows that average per capita consumption

of all types of meat is 34.3 kilograms, which is only 44 percent that in Israel for the same year.

Table (IX - 6)

Per capita consumption of meat and milk - 1979.

	West Bank		Israel
	kg/capita	Total (tons)	kg/capita
Meat - total	34.3	24,170	77.7
Beef	4.9	3,450	19.1
Mutton	8.8	6,200	0.9
Offals, other meat	1.6	1,100	4.4
Preserved	0.2	120	
Poultry	17.0	12,000	44.0
Fish	1.8	1,300	9.3
Milk & milk products	62.3	44,000	97.8
Cow	27.4	19,350	71.0
Sheep & goats	34.3	24,200	7.0
Milk powder	0.6	450	0.6
Sour milk	-	-	19.2
Cheese	(reported with milk)		14.6

Source: 1. Administered Territories Statistics Quarterly 1980, op cit, p 102.

2. Statistical Abstract of Israel 1980, op cit, p 279.

Table (IV-15) demonstrates the point made earlier concerning the increasing significance of poultry in meeting the growing demand for meat since, as indicated in the above data, poultry supplies about one half of all meat consumption, including fish. Mutton is the next most important with a share of one fourth. This is an indication of its high price, and that highlights important

policy guideline for planners of agricultural development.

The situation with regard to milk consumption is even worse. Per capita consumption of milk was only 62 kilograms, and that included milk consumed in all processed forms, whereas milk consumption in Israel for the same year was 90 kilograms, in addition to 15 kilograms of cheese (the corresponding amount of milk is about 100 kilograms).

The data in previous tables indicate a sizeable deficit in milk and beef while there is, according to the same data, a surplus of mutton. The deficit, estimated at more than one third of all milk supply, is supplemented by imports from Israel. This applies in particular to liquid cow milk, which is procured largely from Israel in urban communities. The consumption of liquid milk in most villages is very low and it is often restricted to patients and children due to its excessively high price (eg. around JD 0.16 per kilogram).

Milk from sheep or goats has a different consumption pattern. Only a very small proportion is consumed in fresh liquid form, and the bulk is processed into much more expensive products, mainly yoghurt and white cheese. Unlike cheese from cow milk, cheese made from sheep and goat milk can be preserved in brine (after preliminary boiling) for several months, and is considered by West Bankers as a staple food item. Most families stock their year's supply of cheese in the spring as they usually do with olive oil and pickles. Cow milk, on the other hand, is consumed mostly fresh and only a small part of it is processed into other dairy products.

Owners of sheep and goat herds in Hebron and Bethlehem (many of whom are Bedouins) use some of the milk in the processing of other products which they use for their domestic consumption. Most important of these is what is called locally Jameed, which is made by dehydrating yoghurt into solid balls. Jameed balls are stored for use later in the year, and when the need arises they are dissolved and boiled in hot water to make popular dishes. This is a particularly important staple diet for Bedouins and peasants of Hebron and Bethlehem districts, but it has little importance in the more urbanized villages of middle and northern districts.

Other minor forms of dairy products include butter and yoghurt serum - the latter is a byproduct of butter processing. Both products are consumed locally and they are, as such, important forms of diet for families with marginal food intake. However, only small quantities of both of these products enter into local markets, largely due to the lack of adequate cold storage facilities in producing rural areas.

There are other non-dairy products of sheep and goats, namely, wool hair, hides and manure. The first three are used as raw materials for producing carpets, thick winter dresses, tents, and for stuffing of furnishing. Manure is used extensively in the production of grains and legumes which are produced on a fairly large scale by most livestock owners in Hebron, Bethlehem and Nablus districts.

The foregoing description of sheep and goat production in major producing areas demonstrates clearly that it has a pervasive and profound impact on the livelihood of local communities there, which

is relatively more significant than the role of olives in northern districts. Again, this poses an important parameter for development planners.

Husbandry practices

a. Types of husbandry

There are four patterns of raising sheep and goats in the West Bank namely, Bedouin flocks, village flocks, fattening of lambs, and indoor raising of improved strains. The first two types are by far the most common.

Bedouin flocks are usually larger in size, ranging from 100–150 head versus 10–50 for village flocks.[1] Their share of total population is also larger, but their productivity is generally lower due to more pronounced marginality of pastures. Unlike the situation in village flocks where most owners practice other lines of agriculture, Bedouins rely heavily on their livestock for their whole livelihood.

Fattening of lambs is carried out on a very small scale and with mixed results. The same is true of indoor raising of improved strains. More experience is needed to demonstrate the profitability of both systems under local conditions. Profitability of village sheep flocks will be evaluated later in this chapter.

b. Varieties

There is only one dominant variety of sheep in use, called Awasi, which is a fat-tailed strain characterized by modest milk production (average 100 litres per year), good meat quality (not heavily impregnated with fat), and coarse wool. The productive

1. Fathi Tawfig, The West Bank Livestock Sector, (Ramallah: Department of Research and Extension, 1980) - an unpublished paper, p 5.

potential of this strain is not noticeably high but it is characterized, on the other hand, by a marked tolerance to the local environment, dominated by frequent droughts, scanty pastures, and poor nutrition.

Israeli livestock farms raise another locally-bred variety called Assaf (a cross between Marino and Awasi), which is characterized by a much higher milk production potential (about 400 litres per year), but it is far more demanding in terms of nutrition and husbandry. The results of experience accumulated over the past five years demonstrate clearly the superiority of Assaf over Awasi in flocks raised in closed sheds, while their performance was very poor under more common nomadic conditions.

Regarding goats, the most common variety is Sa'aneen, which is a solid black strain characterized by extreme ruggedness and striking tolerance to ecological variations. They are relatively more tolerant than Awasi sheep, and therefore they are raised in areas with marginal grazing potential. Their milk production is low (80 litres per year), their meat is less fatty, and their tails are considerably smaller. Farmers use a different breed, called Shami, for indoor goat raising. Its colour is basically white, and it is characterized by a much higher milk production (150–200 litres a year) and a higher rate of twin births. The availability of certified goats from near-by Israeli sources has helped increase the number of improved Shami goats raised on the West Bank. While there is little question about the superiority of this strain, it is so demanding on husbandry practices that it cannot be considered as a substitute for the indigenous Sa'aneen strain.

c. Feeding

The grazing season commences early in December and extends through May. During this period grazing is the major source of feed, and barley is served only on a supplemental basis once a day. From June until the end of July, farmers let their flocks scavenge through stuble remaining on harvested wheat and barley fields. In August and through November, sheep and goat flocks are kept on a concentrated grain diet consisting mainly of barley and vetch. Dry fodder consists of alfalfa hay and, more commonly, shredded straw.

Due to marked variations in topography and climate, many Bedouin owners transport their flocks from one region to another in search of natural pastures. Because of the rather poor quality of pastures, animals have to scavenge over long distances in search of food. Such an extensive activity is demanding on energy and it places a ceiling on the livestock's growth potential.

d. Pastures

Until recently there were no artificial pastures on the West Bank. In contrast, pastures consist exclusively of barren hill slopes, forests, or orchards where a variety of wild grasses emerge early in winter after preliminary showers. Due to the presence of wide areas of uncultivated fallow it is possible to support a relatively large livestock population. Production of alfalfa and other forages under irrigation is not practiced, because of scarcity of water resources and the higher comparative advantage of citrus and other forms of irrigated farming. Grazing begins as early as weeds begin to grow. There are no regulations in regard to dates and duration of grazing, and this can lead to severe overgrazing of pastures

and their rapid deterioration.

Very little effort was exerted in the past towards developing and regulating West Bank pastures, although topography and rainfall permit a substantial improvement for large areas. A considerable amount of research has been done in countries with similar or more severe aridity, and it has been demonstrated that a substantial potential exists for expanding pastures by substituting natural fallowing (which is now in extensive use in all Middle Eastern countries) by a crop rotation consisting of wheat and a special strain of Australian clover, called Medicago hespida.[1] FAO and ICRISAT* have organized intensive training courses on the new technology in Australia and Algiers.

The Department of Agriculture in the West Bank is promoting the use of Medicago seeds in growing artificial pastures which could thrive productively for 3-4 years under rainfed conditions. The results obtained by farmers are encouraging, but the project has so far failed to take off on a large scale due to declining resources in the Extension Department and the lack of adequate legislation on grazing rights.

The situation of free-range grazing has deteriorated since occupation as a result of Israel's closure of large areas for security and other reasons, areas which for a long time constituted the bulk of natural pastures for West Bank livestock. This measure will be discussed later under the section on problems.

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1. This was a major theme in many of the papers submitted to the FAO regional seminar on Rainfed Agriculture in the Near East, held in Amman during 5-10 May 1979.

* International Crop Research Institute for the Semi-Arid Tropics.

Profitability analysis

This study is restricted to sheep raised in commercial flocks by villagers and Bedouins. Obviously, it is based on what owners actually do rather than on what they should do.

a. Changes in flock movement:

It is assumed here, on the basis of the survey, that the farmer starts his new year in early October with a flock of 120 ewes, of which 20 are young replacement ewes. The number of rams is five. Mortality is estimated at 3 percent (4 ewes). The rate of pregnancy is estimated at 80 percent, and 90 percent of pregnant ewes give birth to singles and 10 percent to twins (90 lambs). Twenty five percent of the lamb flock is kept for replacement purposes. Fifty percent of the rest is fattened for a period of five months and the rest is sold at the early age of 40-50 days.

b. Cost outlay

		Jordan Dinar per flock*
Fixed expenses		
Depreciation of equipment,	JD 200 @ 10%	20.0
Interest on investment		684.0
Total fixed expenses		704.0
Variable expenses:		
Feed units, total required is 56200 feed units**, distributed as follows:		
Grazing 39300 (free except for wage of shepherd)		-
Mixed concentrates 11200 @ JD 0.0658		737.0
Hay 3900 @ JD 0.046		179.4
Straw 1800 @ JD 0.079		142.2
Veterinary service (medicines and charges) @ JD 1.053		126.4
Water, 2 m^3 per head @ JD 0.92 for 120 heads		220.8

* Consisting of 120 ewes, 5 rams, and subsequent lamb crop.

** Equivalent to one kilogram of barley (12 percent protein).

Shepherd, 425 work-days @ JD 2.1	894.7
Other expenses (transportation, municipal fees etc) @ JD 0.526 per head	63.1
Interest on variable expenses, JD 2363.8 @ 10% for 3 months	58.4
Total variable expenses	2422.0
Total Costs	3126.0

c. Returns:

Milk @ litres per head 9600 litres @ 0.263*	2524.8
Meat	
Culled ewes 20 @ 45 kg @ JD 0.79	711.0
Young lambs 30 @ 20 kg @ JD 1.184	711.4
Fattened lambs 31 @ 35 kg @ JD 1.184	1284.7
Wool, 2 kg/head @ JD 0.84.2	202.1
Manure, 1 m^3/head @ JD 1.05	126.0
Total returns	5560.0
Less total costs	3126.0
Net returns	2434.0
Net returns per ewe	20.28

* Price of milk was derived on the basis of ruling prices of cheese and yoghurt.

d. Discussion of results:

1. Sheep raising under the present nomadic pattern of husbandry is a surprisingly profitable type of agriculture, and probably the most remunerative of all dry farming patterns.

2. The profitability of sheep proved to be relatively less vulnerable to the processes of occupation, although the size of sheep flocks was severely reduced by their impact. The reasons for the relative stability of profits in this sector are the following:

   a. Prices of mutton and cheese have risen at high rates because of a marked local monopoly. Israel does not produce a similar type of cheese and it is not a major exporter of mutton.

   b. Heavy reliance on free grazing, which saves much on expensive concentrates and purchased roughage.

   c. Mobilization of a substantial amount of family labour in the production process.

   d. Minimal use of fixed investments in the form of sheds and equipment, made possible by exploiting available constructions.

3. Productivity is low and, at least theoretically, it gives great room for improvement. But the attainment of a substantially higher productivity has been frustrated by several constraints arising from the decline in extension and veterinary services, and from escalating land encroachment policies.

Problems

1. Closure of a major proportion of natural pastures. This is a severe problem to sheep and goat farmers, because it entails

a drastic decline (over 50 percent) in the area available for natural grazing.[1] Violators are referred to military courts and their flocks are likely to be banished to the Negev.[2]

2. High cost of forages and concentrates. According to a study by a local technician, the cost of feed ingredients has increased during 1971-76 by 7.5 times, while the prices of dairy (and poultry) products have risen by 5.5 times.[3]

3. Poor level of veterinary services. The level of services rendered by the Department veterinarians declined in the middle seventies in response to budget cuts and increased official awareness of the importance of West Bank markets to the Israeli dairy industry. The amount and quality of services rendered by private veterinarians is very limited due to the reluctance of most farmers to pay the required charges. The problem is further compounded by the questionable quality of drugs packed locally under inadequate official control.

4. Inadequate promotion of artificial pastures. Despite the availability of inputs and technology required for a breakthrough in the status of pastures, the success achieved in promoting artificial pastures has been minimal. Although this is influenced by a wide range of factors, yet the most important constraint stems from the rapidly declining potency of extension offices caused by drastically curtailed resources.

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1. It was noted earlier (see section on Land Politics, Chapter III) that close to one million donums (18 percent of total area) was closed by 1979 for military purposes. Most of this kind of land was used for grazing for many years prior to occupation.

2. The researcher was told that trespassing shepherds are sometimes collected by helicopters as a gesture of psychological warfare.

3. A R Arafeh, Livestock sector of the West Bank, a paper submitted to the Arab Thought Forum in Jerusalem, Sept 1981.

5. Occasional shortages in drinking water. This problem makes it sometimes difficult to supply adequate drinking water for large flocks in eastern and southern hills. The problem is rendered more acute in view of remoteness from municipal water supplies and the gradual breakdown of cisterns used for collecting runoff water in the rainy season. Shortage of drinking water is sometimes so severe that it limits the size of flocks which could be supported through the rainless summer months extending from April through October.

6. Early slaughtering of new lamb flocks. A common practice is to dispose of the greater share of the new lamb and kid flocks at an early age, long before making satisfactory use of their growth potential. Counting on the number of heads slaughtered in municipal slaughter-houses (about half of all animals slaughtered) the ratio of sheep slaughtered in 1978/79 amounted to 27 percent of the total population, and that of goats was 20 percent.[1] This means that about half of the sheep and goat population is slaughtered annually. Raisers are obliged to follow this unpleasant practice for fear of severe drought hazards and mounting credit obligations.

Cattle

Number and distribution

There are two major types of cattle on the West Bank, one is an indigenous breed called Baladi and the other consists of improved strains which are mainly Holstein Freisians. According to the latest data (1980), there were 6,131 Baladi cows and 2,512 of improved strains (see Table IX-10). Adding to these 5,200,

1. Derived from slaughter figures published in the Administered Territories Statistics Quarterly 1980, op cit, p 40. Total size of sheep and goat populations is quoted from official files.

heifers, calves, and bulls brings the total number of cattle to 13,843.[1] This represents a substantial drop from the 1966 aggregate figure of 34,492 heads, consisting of 30,604 Baladis and 3,888 of foreign breeds.[2]

Table (IX - 10)

Number of milking cows, 1980

District	Baladi	Improved	Total
Total	6,131	2,512	8,643
Jenin	2,045	285	2,330
Tulkarm	854	528	1,382
Nablus	1,917	678	2,595
Ramallah	682	216	898
Jerusalem		112	112
Jericho	-	97	97
Bethlehem	10	146	156
Hebron	623	450	1,073

Source: Files of the Department of Agriculture.

Notwithstanding the crudeness of data released during the Jordanian and Israeli rules, the drop in the population of cattle has been one of the most significant features in post-occupation agriculture. This was most pronounced in relatively large flocks kept on commercial farms. After several years of gradual decline, most commercial farms have closed down totally and their owners switched to other forms of business.* The dynamics of this phenomenon will be evaluated when assessing the profitability of this type of agriculture.

1. Files of the Department of Agriculture.
2. Agricultural Atlas of Jordan, op cit, pp 88-90.

* A particularly pronounced example was the closure of Waheed Masri's dairy farm in Nablus (around 50 heads), which was a thriving enterprise for more than 20 years prior to occupation.

As is the case in other lines of livestock and poultry, cows are raised in all districts without pronounced regional concentration. In each district the tendency is to have several hundred cows raised close to urban centres, where they dispose of milk and yoghurt without much use of cold storage before delivery to retail terminals.

Consumption and nutritional importance

Cows are raised mainly for milk, and meat is a secondary product derived from the slaughter of culled cows, bulls, and calves. Table (IX-5) shows that cattle provide around 4,000 tons of meat (29 percent of total meat consumption), whereas sheep and goats produce 2.4 times more meat and 1.6 times more milk.

Cow milk is consumed mostly fresh, and it is usually distributed without any interim cooling. Although no bacterial tests have been conducted, there is no doubt that the bacterial count of milk often exceeds permissible limits by the time it gets to consumers' homes. This is particularly true in most months of the year when the temperature is over 70°F for more than 15 hours a day. These hazards are all the more worrying in view of the fact that most liquid milk is consumed by young children and patients.

A major product processed from cow milk is yoghurt. Due to primitive processing techniques and inadequate cold storage, the quality of local yoghurt is also noticeably poor, but that does not seem to constitute an important hygienic hazard because of yoghurt's high acidity. This is also true of labaneh, which is prepared by partial straining of yoghurt.

Small quantities of cow milk go into making soft white cheese. Unlike

cheese made of sheep and goat milk, cow cheese does not store for long and has to be consumed fresh.

Husbandry practices

As was mentioned earlier, the vast majority of cows are kept by peasants as a side line to other types of agriculture or business. The number of farms where the number of milking cows exceeds five is estimated by extension specialists to be less than 40.

Most cows belong to the Baladi group, which is a heterogeneous indigenous strain characterized by the single advantage of being adapted to local conditions, especially poor nutritional standards. Their production, on the other hand, is very modest. Average milk output per year is estimated at 500 litres, as compared with 3750 litres for local Freisians.[1] Likewise, their rate of growth and feed conversion are also poor.

Feeding standards are not much above the genetic aptitude of Baladi cows. The diet consists largely of straw, barley and vetch, in addition to excessive seasonal use of wild grasses and farm refuse. Unlike poultry, cattle feeding has made very little use of ready-to-serve concentrates manufactured by local or Israeli mills.

The health of cattle is often deficient. Worms, external parasites, and Mastitis are all common problems, but virulent infections are somewhat rare. Farmers have little experience in diagnosis and treatment of diseases, whereas the veterinarians in the Department of Agriculture have been instructed not to accept on-farm calls. Although mortality is not particularly high, the cows' performance (as measured in milk and meat production) is frequently badly affected.

1. Estimates of the Planning Unit in the Department of Agriculture.

Insemination of cows is carried out mostly by artificial means. Although it had always been an official duty undertaken by the Department of Agriculture, the A.I. service was stopped in 1978 on account of budget cuts. A.I. is now practiced by private veterinarians and is costly.

Profitability analysis

Table (IX-11) contains a summary of profitability analysis for peasant types of cow herds. According to this study, a herd of two Fresian cows raised under those patterns of husbandry described earlier yields on annual profit of about JD 180.

Looked upon from the standpoint of the raisers themselves, profit margins are even wider, at least in relation to the amount of labour. This raises profits by more than 150 percent, and is one of the main reasons why peasant herds are adequately profitable, in contrast to commercial large herds, where the role of family labour is relatively small. Besides, milk output of small village herds is marketed locally at prices higher than those of Israeli liquid milk, which is widely available in urban markets.

Table (IX - 11)

Profitability of peasant cow herds

Assumptions:

Size of herd - 2 milking cows

Breed - Impure Freisians

Cost of rearing heifers into milking age is offset by the sale price of cows for meat.

Volume of investment:	JD
Market price of cows	1100
Cost of equipment	100
Shed	200
Total	1,400
Fixed costs:	**JD/year**
Depreciation on cows at 10%	110
Depreciation on equipment at 10%	10
Depreciation on shed at 5%	10
Interest on investment at 10%	140
Total fixed costs	270
Variable costs:	
Feed concentrate, 6.0 tons at JD 80	480
Tibin (shredded straw), 4.5 tons at JD 40	180
Grazing for 3-4 months - free	-
Labour for grazing and general husbandry	300
Medicines	60
Water	5
Total variable costs	1025
TOTAL COSTS	1295
Returns:	
Milk, 8000 litres per year at JD 0.16	1280
Calves (two), 40 kgs each at one week of age, at JD 1.6 per kg.	128
Manure, 4 tons at JD 17	68
TOTAL RETURNS	1476
NET RETURNS - family labour included	181
- family labour excluded	481

Problems

1. Competition with Israeli beef and dairy products. This is by far the most important factor responsible for the drastic decline in West Bank cattle farming. Commercial Arab dairy farms face inequitable competition with Israeli dairy products which enjoy the benefits of scale and receive various forms of subsidy. This problem is not as severe in the case of dairy products made from sheep and goat milk because, as explained earlier, they enjoy a marked degree of differentiation in quality. Competition with Israeli beef, unlike that of mutton, is very strong because Israel produces beef on a large scale and at competitive prices.

2. High cost of feed. Unlike sheep and goats, cows cannot rely heavily on natural grazing for their diet, because it is highly inefficient to let them scavenge over wide areas for their daily ration. So most of their feed consists of grains (barley and vetch) and hay. Whether produced on the farm or purchased from local markets, the current cost of feed is so high that it squeezes profits.

3. Shortage of easy credit. Dairy farming is a notable example of a technology and capital-intensive type of agriculture. In most LDC countries credit is advanced to dairy enterprises at concessional terms.* The situation in the West Bank is quite different. Credit for long-term investment purposes is rarely available, even at ruling rates of interest.

4. Weak auxiliary services. This applies to the services rendered

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* This is a public policy in such countries as Israel, Jordan, Iraq, Syria, and practically all other countries of the Middle East.

by the Department of Agriculture, Veterinary Service and cooperative institutions. This was described earlier in chapter IV on Supportive Service Institutions.

Poultry

Poultry production developed on a commercial and intensive scale in about 1960, influenced largely by the Lebanese poultry expansion of the fifties and sixties. The West Bank's poultry industry developed so rapidly that by 1966 there were 190 farms raising about 3 million broilers per year and 32,000 commercial layers, in addition to more than half a million layers of indigenous strains.[1] The industry was served by five hatcheries and two feedmills, all located in the East Bank. Credit facilities were provided at concessional terms by governmental institutions and suppliers of feed and chicks. The levels of technology and productivity were improving so rapidly that by 1967 they were comparable to those in Lebanon and Europe. The rate of growth in poultry production was so high that Jordan (West Bank included) was heading towards self-sufficiency.

The situation of the poultry industry, however, changed with the advent of Israeli occupation in June 1967. Despite a brief initial setback, Jordan's poultry industry resumed its accelerated growth at such a pace that local production of broiler meat reached, in 1981, about six times that of the West Bank, whereas it was, in 1967, only 50 percent higher. In this section we will try to explore the main attributes of the West Bank's poultry farming, and evaluate the prospects of its revival under occupation. The

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1. Hisham Awartani, Problems of Marketing Poultry in Jordan, (Amman: Cooperative Institute, 1966), pp 2, 7.

discussion will cover the two dominant types of poultry farming, egg and meat production.

Production and income

The poultry industry is one of the most important types of live-stock production on the West Bank. According to official income and output data, poultry products (meat and eggs) contributed around 7 percent of gross farm income during 1978-79. Its share was slightly smaller than that of sheep but larger than those of almonds and grapes combined.

It is very difficult to ascertain with reasonable precision the current number of poultry farms and their actual production. Because the actual scale of operation varies so markedly in response to price fluctuations, it is rare to have a reasonably stable supply. However, according to the records of the Department of Agriculture there are about 557 farms of which 507 are specialized in broiler production and 50 in producing table eggs. Annual production for 1980 was estimated at 4610 tons of live broiler meat and 24.5 million eggs (see Table IX-12)

Table (IX - 12)

Number and production capacity of poultry farms, by district (1980)

District	No. of broiler farms	Meat output tons/year	No. of egg farms	No. of layers	Egg output ,000/year
Total	507	4610	50	119,450	24,519
Jenin	128	958	2	20,400	4,284
Tulkarm	57	1325	10	26,800	5,360
Nablus	49	365	2	3,700	740
Ramallah	110	400	16	30,500	6,415
Jerusalem	3	24	1	2,500	450
Jericho	10	287	1	4,000	800
Bethlehem	21	171	9	15,850	3,300
Hebron	129	1080	9	15,700	3,140

Source: Files of the Department of Agriculture.

The geographic distribution of poultry farming reveals no significant regional specialization, except perhaps for a somewhat depressed production in Jerusalem and Jericho districts, the former for "sanitary" restrictions and the latter following massive demographic evacuation. Climate and other natural attributes bear very little on the prospects of altering poultry production in all West Bank regions, because of total dependence on imported feed ingredients and baby chicks.

Supply and consumption

The West Bank population derives its poultry meat and egg supply from two sources: local produce and imports from Israel. Imports from Jordan and other countries are forbidden. Table (IX-13) reveals a comparative analogy of poultry farming in the West Bank, Israel, and Jordan.

Table (IX - 13)

Production, consumption, and trade of poultry

Poultry meat*	Production (tons)	Exports (tons)	Imports (tons)	Domestic Total-tons	Consumption kg/capita/year
West Bank	3,569	-	8,431	12,000	17
Israel	188,500	22,225	2,300	166,830	44
Jordan					12
Eggs (in million)**					
West Bank	30.2	-	26.6	56.8	80
Israel	1772.3	150.6	15.2	1487.6	393
Jordan					110

* Converted to carcass weight at the dressing percentage of 71 percent.

** Converted from weight data at the rate of 55 grams per egg.

Source: 1. Administered Territories Statistics Quarterly, 1980, No 1-2, op cit, p 103.

2. Statistical Abstract of Israel 1980, op cit, p 278.

3. Poultry International, Vol 20, No 8, August 1981, pp 34-36.

The data in Table (IX-13) indicates clearly that the size of the poultry industry and per capita consumption of eggs and broiler meat are still much smaller than those of Israel and Jordan. Furthermore, it is clear that the West Bank has become heavily dependent on imports from Israel for meeting its domestic demand. Consequently, it derives from Israel around 70 percent of its meat supply and 47 percent of its table eggs. This means that the West Bank's poultry industry has a long way to go before it can meet local demand for poultry products. But in order to do so, it is first necessary to explore the dynamics underlying the erratic

development of poultry over the past fourteen years.

Besides being potentially a lucrative type of dry farming, poultry production is perceived by local experts as the most feasible course of action for alleviating the chronic shortage in the West Bank's animal protein supply. This is more true in the light of the poor prospects for achieving a tangible rise in the supply of red meat, fish, and milk products.

Husbandry practices

As is the case in most forms of arid agriculture, poultry farming is undertaken mostly as a side business-line in which owners provide the bulk of labour, capital, and management. Quite frequently, even the sheds used by poultrymen are mobilized for this purpose from old buildings which have a low opportunity cost. Consequently, it is noticed that poultry producers have acquired a marked degree of flexibility with respect to their scale of operations, which hence enables them to adapt quickly to unforeseen market fluctuations.

Broiler production is far more prevalent than egg production. An important reason for this is avoiding deeper and more stable involvement in poultry, so that it is possible for producers to scale down their operations in response to emerging crises. Layer farms offer very little flexibility in this regard, due to the much longer time in which the poultry are tied to the farm.

Day-old baby chicks are procured entirely from Israeli hatcheries which breed hybrid strains of good quality. Until the summer of 1981 the West Bank had no local hatcheries, and earlier efforts to establish some failed. Feed, on the other hand, is available

from Israeli and West Bank mills. There are six local feedmills which have a combined monthly output of about 2500 tons, ie. around 60 percent of domestic needs.

Farmers procure replacement flocks and necessary feed supplies from local dealers who themselves provide producers with all other supplementary inputs (ex. medicines and equipment). These dealers act also as the main source of technical advice for their clients and, until a few years ago, provided them with liberal credit facilities. Credit services advanced by poultry dealers have been severely reduced for fear of losses ensuing from the rapidly falling exchange rate of the Israeli currency relative to the Jordan Dinar, which is the alternative local currency in circulation.

Broiler flocks have an average size of about 3000 chicks per batch, as compared with 2000 hens per layer farm. Broilers are kept in confinement and under intensive care for 50-60 days, in which time they reach the marketable weight of 1.6 - 2.0 kilograms. Poultry raisers deliver their produce to middlemen who in turn channel the live broilers and table eggs to retail dealers of poultry products scattered in nearby rural and urban markets. Practically all West Bank broilers are sold alive in retail poultry shops where they are slaughtered and eviscerated on request, mostly using inefficient and unhygienic equipment.

Laying flocks are either brought one day old and reared to laying age (5 months) or, more commonly, they are bought at the age of 100-120 days from specialized breeding centres in Israel. Layers are kept on farms for 14-18 months in actual production, and then sold for meat at the age of 20-24 months.

Most egg farms use the cage system for rearing layers. The cages themselves are often bought second hand from Israel at attractive prices. Broilers, on the other hand, are raised on the floor using what is called the deep-litter system. Rearing broilers in cages is hampered by certain technical difficulties which have severely restricted their use in the West Bank and Israel, mainly by causing too many chest blisters.

Profitability situation

Being a highly intensive form of agriculture closely tied up with complex market variables, profitability of poultry farming is subject to violent fluctuations which do not always follow a predictable pattern. Therefore profitability varies considerably from one time to another, depending largely on the price relations of production inputs relative to those of end products. Interestingly, profitability of poultry farming is much less influenced at present by disease problems, which were once considered the limiting factor in determining profit or loss.

The following analyses cover broilers and eggs separately, and they are based on data collected in July 1980 and 1981 (see Tables IX - 14 and IX-15).

Unlike most other forms of dry farming, over-head fixed expenses constitute an important cost item which is too large to overlook. The cost of raising pullets from one day to laying age has been substituted by the market price of five months-old pullets because most farmers prefer to buy their pullets close to laying age, instead of going through the often frustrating expereince of rearing them for five months.

Table (IX - 14)

Profitability of broilers

(per 1000 chicks started)

	Unit	Quantity	July 1980		July 1981	
			JD/unit	Value (JD)	JD/unit	Value (JD)
a. Fixed costs (total	10%			33.3		33.3
Depreciation & maintenance				8.3		8.3
Interest on investment (for 2 months)	10%	JD 1500		25.0		25.0
Total fixed costs						
				637.55		636.70
b. Variable costs (total)				110.00	0.164	164.00
Baby chicks	No.	1000	0.11	481.80	104.10	416.40
Feed	ton	4	120.45	15.50		17.00
Medicines				2.70		2.80
Water				13.00	0.14	14.00
Fuel	litres	100	0.13	4.10	0.525	10.50
Wood shavings	sacks	20	0.205	1.00		0.80
Transportation				9.95	0.320	11.20
Mortality	No.	35	0.270	-	-	-
Hired labour	-	-	-			
c. Total costs				670.85		669.00
				571.8		703.60
d. Returns (total)				742.6	0.485	692.6
Live weight	kg	1428	0.52	5.0		5.0
Empty sacks				4.2	1.00	6.0
Manure	m^3	6	0.70			
e. Net returns				80.95		34.6

Table (IX - 15)

Profitability of layers (for a flock of 1000 hens)

July 1980

	Unit	JD/unit	Quant.	Value (JD)
a. Variable costs (total) - for 14 months				
Pullets (5 months old)	No.	1.328	1000	1328.0
Feed	ton	72.3	46.5	3828.0
Medicines				20.0
Water				10.0
Light				22.0
Wood shavings (none for cages)				5.0
Transportation				5.0
Hired labour	man-day	2.0	77	154.0
Mortality	No.	15.2		137.0
b. Depreciation & maintenance				82.0
c. Interest	%	10		320.0
d. TOTAL COST				5911.0
e. RETURNS - TOTAL				6813.0
Eggs	No.	0.026	244000	6344.0
Meat	No.	0.50	848	424.0
Manure	m^3	0.75	60	45.0
f. NET RETURNS				902.0

Discussion of results:

1. Profitability of poultry, both eggs and broilers, fluctuates violently over time, mainly because of erratic changes in the prices of feed and chicks, and in prices of table eggs and poultry meat. Consequently producers may make unusual profits or losses if they either inadvertantly take advantage of a transitionary rise in the price of their produce or, conversely, if they are faced with a sudden rise in the price of feed, while the prices of their produce are relatively stable (See Graph IX-1).

   Fluctuations in profitability are further accentuated by the occasional dumping of cheap Israeli eggs and broilers in West Bank markets.

2. Despite violent changes in profitability, poultry farming has been reasonably profitable over the past two years, mainly due to the Government's monetary policies calling for an eventual lifting of subsidies on poultry products. Though not yet fully enforced, this policy has resulted in a somewhat more equitable competition between West Bank and Israeli poultrymen.

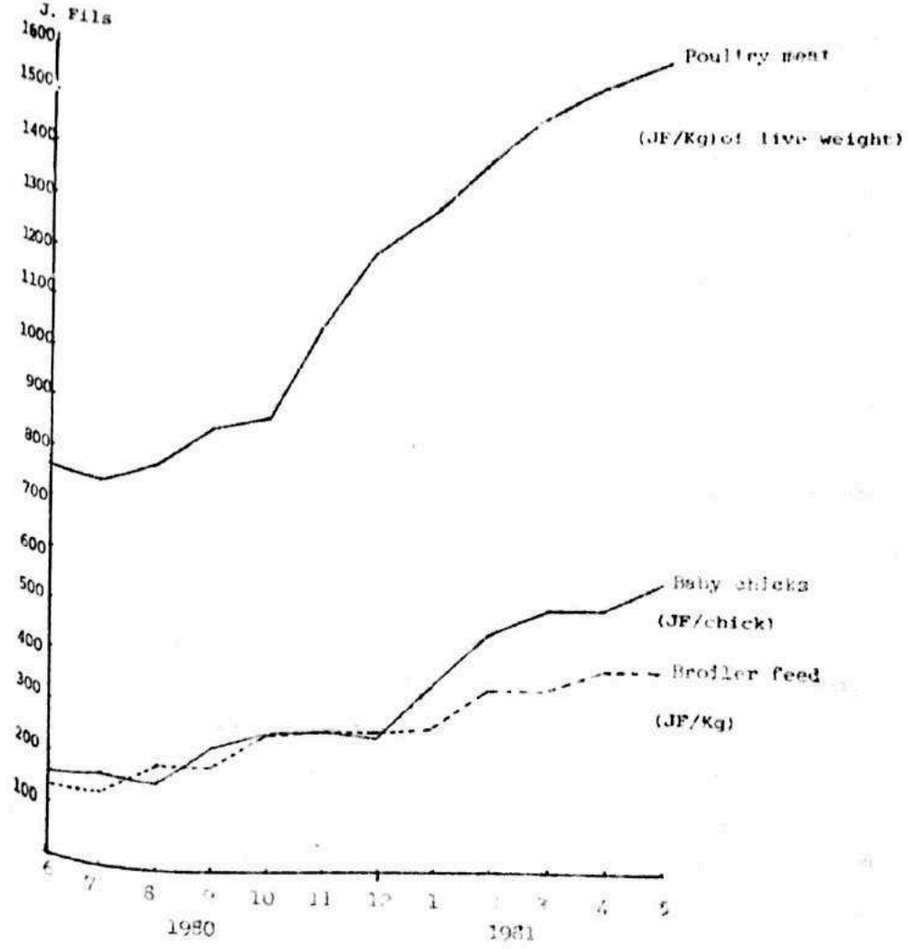
   It should, however, be emphasized that the profit margin is so tight that farmers with high overheads or relatively severe disease problems can easily run into losses.

3. Egg farming is generally believed to be more lucrative than broiler production. The risks involved, however, and the level of expertise and size of needed investment precipitate a certain margin of profit accruing to restricted competition. Should those pre-requisities be made available more freely, egg farming

Graph (IX – 1)

Prices of broiler feed, baby chicks, and poultry meat

(June 80 - May 81)



might expand at a considerably faster pace, as it did in Jordan.

4. The breakdown of cost outlay shows that feed accounts for about 65 percent of broiler and egg cost. It is followed by the cost of chicks and pullets (20% and 22% respectively). This means that any serious attempt to reduce costs should be addressed mainly to feed, chicks and pullets.

5. The cost of hired labour is almost zero in broiler farming, and very low in egg farming. About 80 percent of all poultry farms do not use hired labour at all. Furthermore, the vast majority of poultry raisers are actively involved in other professions, while leaving most of the work needed for their poultry to other members of the family who have low alternative employment opportunities. This has not only reduced costs, but has also minimized out-of-pocket losses and provided needed flexibility in case of crises.

Problems

1. Unreliable supply of baby chicks. Poultry raisers face a chronic problem of inadequate supply of baby chicks, and their orders are only partly met. Israeli hatcheries give priority to Jewish customers and they may, should the need arise, cancel outstanding West Bank orders without advance notice. Although not expressed officially, it has been made clear to the researcher that the Israeli Poultry Board and the Department of Agriculture appear to have placed a ceiling on chicks to be supplied to West Bank poultry farms, which is much lower than their actual production capacity. Importing chicks from other sources, on the other hand, is forbidden.

2. Inadequate control on the quality of baby chicks and feed. There are strong suspicions that the quality of chicks

sold in the West Bank is not adequately supervised, since some hatcheries may sometimes sell chicks of inferior quality, which otherwise may not be approved for sale in Israel.

Likewise, the quality of feed procured from some small mills in Israel and the West Bank is not adequately controlled. This can lead to occasional cases of adulteration, causing substantial losses to producers. It should be noted in this connection that quality of chicks and feed sold in Israel is subjected to quality control measures which are far more stringent than those practiced in the occupied territories.

3. Unsatisfactory technical and credit services. The poultry industries in Israel and Jordan are served by a full range of highly sophisticated institutional services. This includes qualified extension staff, a modern and prompt veterinary service, an efficient marketing structure, and sufficient credit facilities. The situation for all such services in the West Bank is,in the researcher's view, very unsatisfactory. Besides being not particularly well trained in poultry, extension agents are explicitly instructed in their work manuals to restrict their services to advice "if they are approached by farmers".[1] In other words they are asked to display little interest in developing poultry. Veterinarians working in the Department of Agriculture have also reduced their services to a very low level.

Credit facilities for medium and long term purposes almost came

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1. Annual Plans for 1980-81, (Bet Eil: Department of Agriculture in the Military Headquarters), p 5.

to a halt immediately after occupation. This has severely hindered the rapid growth of poultry and limited its modernization potential. The credit situation further tightened when dealers of poultry supplies curtailed their over-draft facilities to their clients, insisting instead on cash payment.

4. Competition with Israeli produce in local markets. This is undoubtedly the most serious impediment to a prosperous local poultry industry. The crux of the problem is that Israeli producers have the advantages of economies of scale which enable them to raise their productivity much higher than is possible in the modest poultry farms on the West Bank. In addition to the benefits of scale, Israeli poultry producers have been aided by an elaborate scheme of subsidies, which until the late seventies amounted to 20-30 percent of the farm-gate price. This placed West Bank poultry raisers at a major disadvantage and limited their chances of competing successfully with the cheap eggs and broilers available to poultry merchants from Israeli farms. Had they not adapted to such hazards by minimizing their out-of-pocket costs, most West Bank poultry producers would have been forced to close down.

Although direct subsidies to Israeli poultrymen have been officially stopped for the last two years, raisers still receive subsidies in less direct forms, though at a lower scale than they were used to. This is an important reason for the improved stability in the profitability of West Bank poultry farming during the past few years.

The question of competition with Israeli produce has another interesting aspect, namely that West Bank poultry products

are strictly forbidden entry into Israeli markets. When this regulation was put into practice it meant banning the flow of eggs and broilers from various parts of the West Bank through East Jerusalem en route to other districts, because the Israeli authorities consider East Jerusalem as part of Israel. Consequently, this has reduced free adjustment of market prices in the northern and southern districts of the West Bank and deprived poultry producers of available opportunities.

5. Unsatisfactory auxiliary marketing services. This is most clear in regard to broilers which are generally sold alive to consumers in retail poultry shops. The problem here is twofold. In the first place the quality of processing is poor, the presence of such shops in crowded markets results in important hygienic problems. Furthermore, selling broilers alive makes them a fragile commodity and prevents farmers from stocking their produce in cold storage, should there be a slackening in prices. An earlier study by the present author has revealed deep-rooted reservations against buying ready-to-cook chickens.[1] Most consumers believe that slaughtering of chickens in modern machines doesn't conform to religious rituals, and it may also encourage producers to slaughter and sell what otherwise might have been sick and unmarketable chickens.

As for eggs, the problems of marketing are of a different nature. Most importantly it is apparent that eggs are not held in cool stores during the hot summer months, which often results in rapid deterioration in their quality. This, however, is not normally a serious problem given the rapid turn-over of table eggs in the local market.

1. Hisham Awartani, Marketing of Eggs and Broilers in Jordan, M.Sc. thesis (American University of Beirut - School of Agriculture, 1964).

PART 3

CHAPTER X

CHAPTER X

THE DEVELOPMENT OF RAINFED AGRICULTURE - AN INTRODUCTION

Development of rainfed agriculture is gaining increasing interest in most developing countries and in a wide range of international agencies. It was repeatedly asserted by participants in a major seminar on development of rainfed patterns of agriculture that it could be one of the main means of alleviating food deficits in Jordan and other countries of the Middle East. In response to this conviction many of these countries have initiated ambitious programmes in this sector, assisted by technical and financial support of specialized institutions with considerable expertise and resources.

Unfortunately, most of the international aid institutions have refrained from extending any support to the West Bank, on the premise of not dealing with the occupied territories as long as they are under occupation. This policy has helped weaken the economic base of these territories, facilitating their economic exploitation by Israel, and making the establishment of a reasonably viable Palestinian state increasingly difficult. What has made things worse, is that local service institutions have fallen under direct Israel control and, as argued earlier, have tended to be run down over the past 14 years. Consequently there are no national infrastructure groups engaged in such conventional assignments as producing in-depth sectoral studies and formulating detailed strategies and blueprints which would help guide interested governments and international institutions. Whatever the Military Administration is doing along those lines appears orientated in the first place towards fulfilling Israeli interests, often at the expense of the occupied territories themselves.

As was stated earlier under Objectives, this study is meant to provide guidelines to those interested in developing one of the West Bank's most important sectors, namely, rainfed agriculture. It is not intended to be a substitute for detailed plans and feasibility studies for individual projects. Such an assignment has been well beyond the technical and financial resources available to the researcher in the present study.

What political scenario?

Unlike the situation in most other countries, development of the West Bank economy carries profound political implications which often over-ride conventional economic and social criteria. This is more true in the case of agriculture, because of its heavy bearing on fundamental issues underlying the Palestinian-Israeli conflict, such as land, water and population changes. So before articulating a developmental strategy for such a highly politically charged sector, one should first outline the political setting within which development is to take place. This was the crucial but somewhat speculative issue which overshadowed economic forcasts envisioned for the occupied territories by such economists as Vivian Bull (The West Bank-Is It Viable?), Brain van Arkadie (Benefits and Burdens), and Elias Tuma and H. Drabkin (The Economic Case For Palestine). Ever since June 1967, the question has remained the same: what is the political scenario to be assumed by the development economist?

Many economists were attracted to explore the economic viability and development potential following Israeli withdrawal and the establishment of an independent Palestinian State. Such economic scenarios, however, proved of little practical value because of one fundamental impediment - continued occupation. Even now, 15 years after the onset of Israeli occupation, it remains unduly optimistic

to talk about an impending withdrawal and the establishment of a sovereign Palestinian state that is able to excercise its rights to a national economic policy.

A less idealistic political scenario is the one spelled out in Camp David accords, which talk about "total autonomy" for the people of the West Bank and Gaza Strip. But agreement on autonomy has proved to be more semantic than substantial since talks in this regard have come to a stalemate because of sharp divergences in political views. Three years after Camp David the three partners of the "Peace Treaty" are no closer to agreeing on the substance of the advocated autonomy. Even if ultimately they manage to strike a compromise, it may not be possible to implement because of strong opposition by local residents.

A third scenario envisages continued Israeli occupation. This is a solid and fairly well-defined political discourse which has troubled most West Bankers for 15 years. Clearly enough, most sides (including many Israelis) would like to see an end to this situation. But as we argued earlier, the questions of what to do next and when to do it are not likely to find easy answers.

The researcher has debated over the question of choosing a viable political scenario with many leading politicians and economists. All Palestinian and Arab leaders who were interviewed in the course of this research recommended restricting developmental studies which are conducted by economists residing inside the occupied territories to the present context of continued occupation, whereas they agree that researchers stationed "outside" Palestine might embark on problems of a broader and more theoretical perspective.

The arguments in favour of this choice are numerous and fairly convincing. Most well-informed politicians believe that Israeli

control of the West Bank (and the Gaza Strip) will continue in one form or another for as long as Arabs remain unable to force Israel to leave. This seems unlikely in the forseeable future. In the meantime Israel is likely to implement policies which are intended to exploit their local resources and market potential to the best interest of Israel's ailing economy.* Counting on the record of the past 15 years, this entails a grave and sometimes irrevocable damage to some basic resources and sectors. Consequently, the priority should go, as Palestinian leaders see it, to taking those measures and policies which would help stop the deterioration of the local production base and ameliorate the impact of Israel's annexation policies. To this end, the Arab Summit Conference of 1978 earmarked $150 millions and created a permanent agency, the Palestinian-Jordanian Joint Committee (PJJC).

However, developmental efforts launched by the PJJC and other international organizations (e.g. voluntary agencies, EEC, UN specialized bodies) are all faced with the chronic dilemma of inadequate information. Statistics released by Israeli sources are far too conjectural (and possibly biased) to permit using them for planning purposes. Furthermore, they are not detailed enough to permit drawing conclusions for localized or specialized purposes.** This entails a distinctive "location" advantage to economists residing in the territories themselves, which is not accessible to those living outside Palestine.

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* Examples of economic exploitation were discussed earlier in this thesis in Chapters III, IV, and V.

** For example, statistics of all occupied territories are covered by 43 pages in the Statistical Abstract of Israel for 1980, as contrasted to 677 pages devoted to Israeli statistics.

In the future, and whenever a Palestinian state is formed, the whole process of economic development will have to be re-oriented on more institutional grounds. In that event, there will be no shortage of information and expertise. Until then, however, West Bank economists (and the researcher is no exception) are wise to concentrate on improving the economic predicament of the occupied territories as long as they are still under occupation.

Frame of reference

Economic transformation in the occupied territories during the past 15 years, as might have been inferred from previous chapters, is so profound and comprehensive that it deserves a number of indepth sectoral studies. Consequently, development guidelines and blueprints are needed for all sectors. This, as spelled out early in the section on objectives, is well beyond the scope of this study. Therefore, the forthcoming strategies and the subsequent proposals (metaphorically described as a plan) are limited by the following restrictions:

a. For reasons argued earlier, the plan will be confined to a scenario of continued Israeli occupation.

b. The introductory part of the plan will deal with infrastructural transformations which are of a pervasive nature relating to agriculture as a whole. The second part of the plan, however, deals only with rainfed patterns of agriculture, including livestock and poultry.

c. Infrastructural developments which are suggested in the introductory part of the plan relate to both West Bank and Gaza Strip. But the second part is specific to the West Bank, although it is fully realized that both territories constitute one political entity. Evaluation of Gaza's agriculture and economy should be

undertaken in specialized studies.

d. The plan will not deal with those institutional transformations which require official endorsement. As such, this section will not propose changes in legislature governing such institutions as inheritence laws, tenancy, zoning, and market structure. Notwithstanding the tremendous importance for such transformations in accelerating agricultural development, their promulgation is not desirable as long as the West Bank is governed by Israel, for fear of re-aligning them to serve Israel's interests.

Suggested development strategies

The development of rainfed agriculture should be viewed within the broader context of a national agricultural strategy embracing all agricultural sectors and resources. Based on previous economic, political and social parameters, the researcher proposes the following objectives as the basis for a national agricultural policy, which is to be valid as long as the occupied territories remain under Israeli occupation. Obviously, each of these objectives will have to be translated into practice through a number of detailed projects and measures. Those of them dealing with rainfed patterns of agriculture will be summarized in this chapter, whereas other agricultural sectors require independent studies. No effort is made here to substantiate each of the objectives listed below, since this has been argued at greater length in earlier chapters.

1. Extensive horizontal expansion in land use. Notwithstanding conventional arguments of zoning and increasingly selective land use in agriculture, Palestinian farmers should embark on a policy of maximal horizontal exploitation. This stems from the basic premise that land use in Palestine is governed more by political strategies than by purely economical considerations which are commonly advocated in the context modernized agriculture. The

Zionist movement for example has certainly not been mindful only of economics in its policies of land acquisition and use.

2. Maximizing the efficiency of water use in agriculture. As Israel is not likely to forego its tight control on water resources, West Bankers should try their best to improve their efficiency of using available resources, in an effort to maximize the area under irrigation. Also, more should be done towards exploiting more rain water in raising productivity of rainfed patterns of agriculture.
3. Raising the labour-absorptive capacity of agriculture. This is necessitated by the dislocation hazards arising from having more than one third of the labour force employed in Israel. Furthermore, it is felt that labour mobility out of agriculture weakens the labourers' attachment to their homes and renders them more vulnerable to emigration. Admittedly, the proposed policy is opposed to modern economic thinking and may entail considerable costs, but policy makers believe that political returns do warrant the economic cost.
4. Reducing dependence on Israel for food. The West Bank's excessive dependence on Israel for food entails economic and political hazards which could pre-empt the Palestinians' demand for independence. It is partly true that residents of the occupied territories take advantage of buying subsidized Israeli produce, but the long-term cost is certainly exorbitant. It makes little sense not to subsidize the production of those commodities on the West Bank itself, and thereby generate a badly needed economic activity. A more familiar version of import substitution policies is adopted by less developed countries in regard to industrial products.

5. Vigorous expansion of fruit tree orchards. Visible attachment of Palestinians to their land has helped impede Israel's aggressive encroachment policies. Besides the construction of houses and urban facilities, this policy is best served by the dissemination of fruit tree plantations and by the rehabilitation of neglected orchards. The implementation of this policy is faciliated by the presence of wide areas of marginal land which are not fit for other forms of commercial farming. Not surprisingly, the Military Administration displays a cautious attitude to rainfed trees, and in contrast, it offers active support to field crops, particularly those contracted for export through AGRESCO.
6. Providing active support to peasant forms of farming. This should come in the form of side projects undertaken by farmers who are employed in other professions or types of agriculture. In this way it becomes possible to mobilize large inputs of land and family labour at acceptable levels of efficiency. In fact this kind of quasi-peasant farming is probably more able to survive the strong competitionwith Israeli produce than most patterns of capital-intensive and market-oriented agricultural production. Evidently, this policy should be reconsidered in the post-occupation era.

Policy guidelines

The development of West Bank agriculture under the present setting of Israeli occupation has many ramifications which bear heavily on the process of agricultural development. This gives rise to a number of policy guidelines which constitute useful yardsticks for directing resources and measuring growth, sometimes in ways which are contradictory to conventional economic theories. As a result of the researcher's involvement in West Bank agriculture during the past decade, and in view of intensive contacts carried for the purpose of this research,

the following ideas are put forth as guidelines for development policies.

1. If viewed strictly on their economic merits, one may conclude a poor predicament for most economic and agricultural sectors as long as Israel is in control of the occupied territories. The researcher holds to a markedly different view. If Palestinian economists are to be drawn into dismissing developmental projects on the premise of negative economic feasibility, then this will signal the end for most areas of economic activity, possibly even many for which local residents may possess an economic comparative advantage. It is quite clear that Israel can and has the means ultimately to direct any economic sector to a situation where abandonment of that sector is the economically "rational" conclusion. But it is important to note, however, that Israel may incur for this purpose an exorbitant economic cost. It will be naive therefore to refrain from supporting a more vigorous growth in an economic sector on account of inadequate economic viability.

In response to this paradox the researcher suggests evaluating development projects on the basis of what might be described as their "national viability" which, obviously, carries a definite political connotation. Consequently, financial liabilities entailed by inadequate profitability of certain projects should be considered as a national obligation rather than merely an entrepreneurial risk. In pursuance to this argument it becomes necessary to subsidize certain types of farming with a margin wide enough to raise their economic feasibility to a level sufficiently attractive to potential producers.

The concept of subsidizing agriculture in various forms is not

uncommon in countries enjoying the benefits of national regimes, whether with socialist or capitalist economies. Although subsidization of agriculture is justified on social grounds, its adoption in the occupied territories is further justified by the inequitable exposure of local produce to competition with Israeli products enjoying large subsidies and support.

Upon accepting the principle of selective subsidies, many practical questions remain to be solved, most importantly, how much is needed, where to get it, and how to channel it. Some of these questions will be answered in the remaining chapters.

2. Conforming with its policies of resisting any genuine development in the local production base, the Military Administration is expected to take a hostile stand against most proposed developmental projects. The most important measure they are likely to resort to for this purpose is to obstruct the flow of aid earmarked by Arab and foreign agencies[1]. Alternatively, the Military Administration might try hard to manipulate the flow of appropriated aid in a way which serves its own political strategies, which are oriented towards creating a substitute leadership to the PLO[2].

This constraint to accelerated economic development in the occupied territories was raised with many politicians and economists. It is generally agreed that conditioning the flow of aid to Israel's approval is self-defeating and that a new strategy should be adopted, based on the following guidelines:

a. The principle of soliciting Israeli approval on aid received

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1 Refer to Chapter IV for more details, especially under the section on Cooperatives.

2 The most noted example is the creation of what are called "Village Leagues", which were discussed in Chapter IV under the section on Cooperatives.

from voluntary agencies and concerned governments should be avoided, as long as the received aid is appropriated strictly for developmental purposes.

b. Disbursement of aid appropriated by the Palestinian-Jordanian Joint Committee, which is by far the most important source of development funds, should be carried out through means and intermediaries other than its present narrow range of functionaries. Disbursement should be conducted more discreetly and through a number of third intermediaries, some of which might be major international organizations.

3. Because of the highly exceptional status of the occupied territories, the formulation of development schemes and their eventual implementation requires the adoption of criteria and yardsticks which are not conventional and probably unacceptable by other countries. This applies in particular to security requirements on advanced loans.

A summary of problems impeding agricultural growth

Previous chapters have included a comprehensive exposition of the problems and constraints which impede agricultural growth. This section contains a summary of these problems which is intended to help direct the focus of suggested projects and infrastructural recommendations. Problems of purely technical nature are not mentioned here except in as much as they relate to economic criteria.

1.0 Land

1.1 Gradual contraction in the area under active cultivation by Arab farmers, as opposed to rapid expansion in the area of land under various forms of Israeli control.

1.2 Increasing dangers of erosion.

1.3 Deterioration of stone walls holding terraces.

1.4 Rising costs of land development due to higher cost outlays and low returns.

1.5 Poor mechanization in rough hilly slopes due to inadequate machinery, whether in regard to type or number of available machines.

1.6 Fragmentation of holdings to non-viable sizes and the dispersion of plots in one holding over widely isolated areas.

1.7 Very poor condition of agricultural roads.

2.0 Water

2.1 Tight Israeli control on water resources, most notably by banning the drilling of new wells and imposing a low ceiling on the quantity of water which can be discharged from existing wells.

2.2 Low efficiency of carrying water to farms and of irrigation techniques.

2.3 Inadequate exploitation of surface water for the purpose of providing supplemental water to rainfed crops during the long and dry summer months.

2.4 Poor condition of most springs and many artesian wells due to inadequate maintenance and management practices.

2.5 No permits given for constructing dams and other projects intended to facilitate better exploitation of surface water.

2.6 Denial of the West Bank of its legitimate share of Jordan river water, despite being a major partner under international law and admitted in the Johnston Plan.

3.0 Labour

3.1 Sharp decline in labour employed in agriculture due to a pronounced sectoral and locational mobility.

3.2 Higher wages in non-agricultural sectors leading to poorer profitability in agriculture, especially in rainfed farming. The problem is partly offset through exploitation of family labour with low opportunity cost, but further expansion in farming would have to depend more heavily on hired labour.

3.3 Farmers have a low aptitude for accepting and absorbing new technology at rates comparable to those in Israel. This is due mainly to the higher age of farmers and to their modest level of literacy.

4.0 Agricultural trade

4.1 Unrestricted flow of Israeli produce enjoying all the benefits of scale and a restrictive national authority. This has led to unfair competition with local produce and to excessive dependance on Israel as a major source of food supply.

4.2 Selective and increasingly costly entry of produce from the territories into Israeli markets.

4.3 Excessive complications in export trade with Jordan, whether in regard to procurement of permits or delays on both sides of the bridges. The cost of transportation is also exorbitant due to the small number of trucks permitted to cross the bridges to Amman, and due to high cost of boxes (since they are not permitted to be returned home - for security reasons).

4.4 Low level of such auxiliary marketing services such as cold storage, packing and transportation.

4.5 Inadequate processing facilities which are consequently incapable of absorbing a substantial part of surplus produce.

4.6 Insufficiently competitive channelling of produce leading to unjustifiably high margins earned by middlemen.

5.0 Agricultural extension, research, and education

5.1 Sharply declining effectiveness of extension staff due to disinterest of the Military Administration.

5.2 Poor morale of extension staff, precipitated by harsh administrative policies, low salaries and inadequate budget allocations.

5.3 Inadequate training opportunities for extension and research staff.

5.4 Limited research conducted on problems of arid farming on hilly slopes.

5.5 Very low involvement of Arab technicians in expediting research on local problems, this being undertaken solely by Israeli Institutions.

5.6 Pronounced failure of agricultural schools in augmenting agricultural development. Furthermore, there is no professional institute or college which is entrusted with the assignment of producing technicians who are qualified enough to undertake farming as a profession.

6.0 Cooperative societies

6.1 Slow processing of registration procedures and manipulation of registration proceedings for political gain.

6.2 Subordination of all financial and administrative decisions relative to cooperatives to centralized supervision and control by the Military Administration.

6.3 Inadequate managerial and accounting level of executive staff in most cooperatives, in sharp contrast to competing local and Israeli firms.

6.4 Low level of auxiliary services in such areas as auditing, education, and inservice training.

7.0 Finance

7.1 Abrogation of all forms of institutional credit since the onset

of occupation.

7.2 Sharp decline in the volume of credit advanced by agricultural business firms due to the continuous and drastic decline in the value of Israeli currency.

7.3 Reticence of most farmers to invest in local projects due to low rates of return, consequently leading to a growing exodus of capital to foreign markets.

7.4 Insufficient amount of aid advanced by voluntary agencies, partly due to severe restrictions imposed by the Military Administration.

7.5 Vague and confused processing of aid funds advanced by the Palestinian - Jordanian Joint Committee. This has led to inefficiency of advanced aid and to a pronounced prejudice against small farmers.

8.0 Fruit trees

8.1 Excessively rough topography, which severely impedes the pace of technological change and poses a low ceiling on productivity.

8.2 High cost of hired labour, which is required at high levels for picking and ploughing.

8.3 Profitability is too low to justify large investments for such purposes as reclamation of rocky land or development of collection cisterns. The problem is aggravated by the high opportunity cost of capital elsewhere and also by land confiscation hazards.

8.4 Cost of purchased inputs rising at rates much higher than the prices of end products.

8.5 Severe insect and disease damage. Most striking examples are olive fruit fly, almond wasp, stem borers, and scaly fig insect.

8.6 Lack of water in run-down orchards where it is needed for

supplemental irrigation of young seedlings and for spraying of weedkillers and insecticides.

8.7 Severe varietal problems in the case of some fruit trees. A noted example is the Dabouki grape.

8.8 Unsatisfactory roads connecting orchards with neighbouring highways.

8.9 Poor level of processing and storage services, hence making disposal of surplus produce more difficult.

8.10 High margins earned by middlemen due to an insufficiently competitive market structure.

8.11 Inequitable competition with Israeli produce, which enjoys substantial scale and subsidy benefits.

8.12 Erratic flow of produce to Jordan, made worse by complex routines, high cost of trucking, and frequent delays.

8.13 Competition of imported seed and olive oils with locally produced olive oil, leading to a steady decline in the per capita consumption of local oil. The problem is further compounded by unsatsifactory quality control measures which have led to an impaired reputation of Palestinian olive oil in export markets.

9.0 Field crops and vegetables

9.1 Pronounced and erratic fluctuations in rainfall, which may result sometimes in a substantial drop in yields.

9.2 Inadequate machine services in most areas of marginal production. This is not only true for seedbed preparation, but also for such services as spraying, weed control, and harvesting.

9.3 Scarcity of certified seeds.

9.4 Reduced supply of free family labour with a low opportunity cost.

9.5 Competition with imported products, as in sesame and chickpeas.

10.0 Livestock and poultry

10.1 Closure of a major proportion of natural pastures and inadequate dissemination of artificial pastures. Coupled with rising costs of forages and concentrates, these problems have resulted in a sharp rise in the cost of feed.

10.2 Occasional droughts leading to shortages of drinking water and poor quality pastures, motivating farmers to dispose of a large part of their lamb crop at a premature age.

10.3 Competition with Israeli poultry and dairy products which are produced much more efficiently and under an elaborate system of subsidies.

10.4 Inadequate and erratic supply of baby chicks.

10.5 Poor level of veterinary and extension services.

10.6 Lack of easy credit facilities, whether from institutional or private sources.

10.7 Unsatisfactory level of processing services, most clear in the case of broilers, which are slaughtered and eviscerated by using primitive techniques, and milk products which are processed and distributed in unhygienic ways.

Development Guidelines

In the context of this summary of problems and limitations, the following chapters discuss development guidelines for the major sectors of rain-fed agriculture.

CHAPTER XI

CHAPTER XI

INSTITUTIONAL ADJUSTMENTS

Leading on from previous data and analyses and in view of all constraints and guidelines discussed earlier in this study, the researcher proposes in this and the next two chapters, several projects and measures which are intended to initiate and sustain a high rate of growth in rainfed sectors of agriculture. Admittedly, this work still falls short of being a development plan in the real sense, since there are too many uncertainties to make planning possible before the termination of Israeli authority over the occupied territories.

The suggested projects are classified into two categories: the first is addressed towards building infrastructures capable of providing an efficient and well integrated package of services which are needed for accelerating the process of agricultural development; the second category includes projects of a specialized nature aimed at developing specific sectors of rainfed agriculture. Each proposal is described briefly in regard to its objectives, requirements and implementation mechanics. No effort is made to conduct detailed feasibility analyses of proposed projects, because this is beyond the scope of this research. However, the researcher has often drawn on analyses conducted for similar projects in Jordan and the West Bank.

1.0 Administration of agricultural development

1.1 Granting ministerial authority to the Joint Committee.

In order to expedite economic and agricultural development in the occupied territories while they are under occupation, the researcher proposes granting the Palestinian-Jordanian Joint Committee (PJJC) ministerial authority over development policies relative to those territories. Although this is not a particularly attractive option for the PLO leadership which is sensitive to Jordan's involvement in Palestinian affairs, this step, however, is practically unavoidable for breaking the deadlock resulting from Israel's embargo on aid channelled explicitly through the PLO. It should be emphasized, however, that the proposed measures should not entail any political connotation which contradicts with earlier decisions taken by successive Arab summit conferences endorsing the PLO as the legitimate and sole representative of the Palestinians.

1.2 Establishing a Central Agricultural Development Board.

The proposed board is conceived as the functional alternative to a national ministry of agriculture. For practical purposes it should be stationed in Amman. Members of the Board would be appointed by the Joint Committee, and they should include members from within and outside the occupied territories. The functions of the Board should be spelled out in its bye-laws, and they should bear on all institutional services which are necessary to implement a national agricultural policy.

1.3 Development of the Rural Research Centre (RRC).

This centre is intended to be the technical arm for the agricultural board mentioned above. It will be engaged in a

wide range of development-oriented studies in the fields of agriculture, rural industries, sociology, health, and education. Its mandate will include feasibility studies of proposed projects and progress appraisal of existing ones. It will be affiliated to An-Najah National University but enjoying a marked degree of autonomy and discretion. The studies to be undertaken by the RRC will be conducted by researchers employed at the centre itself and by external consultants who may be recruited for specified studies. A potential source of expertise is short-term affiliation of M.A and Ph.D. researchers whose interests happen to coincide with those of the RRC. Eligible candidates will be sponsored by the Centre for a specified period in return for publishing rights of the final report.

A detailed proposal concerning the establishment of the RRC was submitted in the fall of 1980 to the Arab Fund for Economic and Social Development in Kuwait, which accepted it and earmarked for the proposed centre a grant of $270,000. Accordingly, the RRC was established in May 1981.

2.0 Extension, research, and education

2.1 Inservice training for extension and research staff.

It is strongly recommended to initiate a sustained program of professional inservice training for extension and research staff. The present number of eligible students is around 50, and that is small enough to provide them with adequate training opportunities within a short time. Duration of training should range from 3 - 15 months during which the emphasis should be placed on providing professional skills for trainees rather than on achieving academic qualifications. Much of the needed training

could be accomplished in specialized research centres and institutes established by international agencies and some governments. Due to the technical and highly elaborate nature of this program, it is proposed to have it delegated to the training department of the FAO, which has already agreed to offer five training opportunities to West Bank technicians, leading to an M.Sc. in certain fields of agriculture. It is proposed to continue this program.

2.2 Expanding extension staff of voluntary agencies.

It is recommended that the Community Development Foundation and the Mennonites Central Committee employ technical field officers covering such specialized areas as irrigation and soil science, horticulture, and pest control. Counting on the record of existing agricultural staff of voluntary agencies, the new addition will help materially in improving the standard of extension services available to West Bank farmers.

2.3 Modernizing the Khadourie and A'rroub Agricultural Schools

Both schools suffer from severe technical and financial shortages. It is proposed to extend necessary aid to both of them in order to help them assume their potentially important role in developing West Bank agriculture. Although both schools are under the authority of the Military Administration, it is likely that they will be permitted to receive aid from a "safe" third party.

The introductory study which would diagnose problems and propose needed developments and project their cost could be undertaken by the Rural Research Centre (see 1.3).

2.4 Conducting a feasibility study for a college of agriculture.

It was noted earlier that there are serious doubts on the

validity of establishing a local college of agriculture, an idea which is being considered by An-Najah and Birzeit Universities. But for a number of political reasons, on the other hand, senior officials in both universities as well as leading politicians, seem to agree on the need for a carefully designed college of agriculture on the West Bank. Consequently, if a decision to establish such a school is taken, it is very important that the right type of school is established.

The curriculum of the proposed school would primarily meet the specific professional needs of agriculture on the West Bank and Gaza Strip. Its curriculum would focus on qualifying graduates as competent farmers and agri-businessmen, rather than solely on theoritical academic instruction. In addition to its teaching programme, it would also initiate an active research program centred on the problems and constraints impeding agricultural growth. The proposed school would be expected to launch a program of adaptive research making adequate use of the abundant supply of primary research findings released by nearby Israeli and Jordanian institutions.

As a preliminary step, it is proposed to conduct a feasibility study for the appropriate type of school indicating location, curricula, and financial and technical allocations required for this project.

2.5 Establishing a Horticultural Research Unit

Introduction of modern production techniques and monitoring of the modernization process in olive and other fruit trees should be entrusted to a specialized unit affiliated to An-Najah

University in Nablus*. The project might start first as a section in the Rural Research Centre, especially as the Centre intends to recruit one or two trained horticulturists. In the future it may be possible to develop the said unit into a seperate body under the name of the Horticultural Research Unit, and have it annexed to a college of agriculture, when one is established.

The suggested unit would be engaged mainly in the search for appropriate innovations and testing them locally. As such the unit's technicians will draw heavily on the experience and technology generated by research institutions in other countries.

The suggested Horticultural Research Unit would have to cater for several kinds of fruit trees, but priority should go to olives, citrus, and grapes. Its staff would consist in the beginning of a qualified horticulturist, an assistant, and a laboratory technician. 2 - 3 years later more horticulturists would be added, one specialized in citrus and subtropical fruits and others in vegetable crops.

3.0 Cooperatives

3.1 Establishing the Cooperative Institute (CI)

The proposed institute would be established through the technical and financial assistance of the FAO as a joint project with Bethlehem University. It would be entrusted with all kinds of educational and training activities for members of cooperatives and managerial staff. A proposal to this effect has been already submitted to the FAO which expressed a positive initial response.

* A recommendation to this effect has already been made by participants at the Agricultural Seminar sponsored by the Arab Thought Forum, held at An-Najah University on August 21, 1981.

3.2 Establishing the Cooperative Bank

Due to the distinctive nature of cooperative credit, it is proposed to establish a specialized cooperative bank. The proposed bank might start out as part of the Palestinian Agricultural Credit Corporation (see 4.1 below), but it may be advisable to give it independence at a later stage. In this case the Bank would be managed by a board of directors nominated by the Joint Committee.

3.3 Substituting seasonal cash loans by services in kind.

It was indicated earlier (refer to the section on Cooperatives), that cash loans distributed by regional cooperatives to member farmers have been improperly used by borrowing members. Furthermore, scarcity of working capital was not considered a serious obstacle for developing West Bank agriculture, in constrast to the scarcity of modern techniques and services available to peasant farmers in rainfed areas. It is therefore strongly recommended to provide seasonal loans to eligible farmers in those areas in the form of improved technology, such as the provision of machine service and expertise needed in the spraying of weed killers, insecticides and in seedbed preparation.

The suggested project calls for providing interested farmers with recommended services at subsidized rates through a variety of intermediaries, such as cooperative societies, machine service units (see 5.5), voluntary agencies (see 4.4), and the Agricultural Development Corporation (see 4.5). The financial ramifications of the project will be evaluated in Table (XIV - I).

4.0 <u>Agricultural finance</u>

4.1 Establishing the Palestine Agricultural Credit Corporation (PACC).

This is one of the fundamental projects envisaged in this study for the purpose of developing West Bank agriculture. It is modelled on Jordan's Agricultural Credit Corporation (ACC), which has played a key role in developing Jordan's agriculture. The by-laws of PACC and the nomination of its board members would be approved by the Joint Committee. Its services will be available to all eligible borrowers, whether they are individual farmers, companies, or cooperatives (see 3.2).

The establishment of PACC is conceived as a major breakthrough in the present arrangement whereby agricultural loans are issued by the Joint Committee itself, and only to cooperatives or institutional entities. This procedure is markedly inefficient and inequitable, since it renders credit accessible only to a small and unduly privileged stratum of rich and powerful farmers. By delegating this job to a professional organization like the PACC it should be possible to reach farmers of a much wider spectrum and provide them with a more expedient service. Furthermore, in this way it would be exceedingly difficult for the Military Administration to obstruct the flow of funds, in contrast to its presently tight control of aid advanced to institutional recipients. Due to existing constraints PACC would be stationed temporarily in Amman.

The starting capital of PACC is estimated at JD 2.0 million, which is quite modest in comparison with Jordan's Agricultural credit Corporation (JD 8 million) and Jordan's Cooperative Organization (JD 5 million). During the subsequent three years PACC capital would be raised to JD 4.0 millions.

4.2 Building institutions for the processing of PACC loans.

Field processing of PACC loans could be efficiently undertaken only through a resident staff of technicians available in various districts. It is proposed to hire a staff of nine qualified technicians to be stationed in Hebron, Bethlehem, Jericho, Ramallah Nablus, Tulkarm, Jenin and the Gaza Strip (two representatives). The said technicians could be conveniently affiliated to local chambers of commerce, on which the Military Administration have no direct authority. Each representative would have one assistant and a secretary/accountant.

Applications for loans should be studied and evaluated by a district committee of three members consisting of respective PACC representatives, director of Cooperatives Department and director of agriculture or, if not possible, a qualified farmer designated for this purpose by PACC management*. Applications would then be referred to PACC headquarters in Amman for final approval. Applications for loans of over JD 5000 should be referred for further evaluation by the Rural Research Center. Business should be maintained at a low profile with a neutral approach to politics and local controversies. In addition to evaluating applications, PACC representatives could help monitor the implementation of projects.

4.3 Auditing of financed projects.

All individuals or groups receiving loans or grants of over JD 1000 would be required to submit annual or semi-annual auditing reports prepared by certified auditors. PACC management would designate a number of existing auditing offices for this purpose

* Jordan's ACC demands a thorough evaluation of applications by a regional committee of three members consisting of ACC district officer, the director of agriculture and a well-informed and respectd farmer.

and pay part of their fees, so that borrowers would have to pay only half of the required charges.

4.4 Expanding resources available to voluntary agencies.

Notwithstanding long term political ramifications, it is proposed to channel more of the resources raised for the development of the occupied territories through some of the currently operating voluntary agencies. This should be done on a project basis and possibly through third intermediaries sufficiently acceptable to Israeli authorities. With their relatively large staff and easy accessibility to farmers, voluntary agencies may act as efficient functionaries for certain types of projects, particularly those involving the introduction of new technologies, e.g. drip irrigation, spraying of weedkillers and insecticides, and distribution of fruit tree seedlings.

The amounts of extra finance to be channelled to voluntary agencies is difficult to project, depending on many variables. A rough estimate of the required capital outlays will be presented individually under the specific projects which are listed in this plan, and which are recommended to be delegated in part to voluntary agencies. Overhead expenses, however, are assumed to be undertaken solely (as they are so far) by the agencies themselves.

4.5 Establishing the Agricultural Development Corporation.

In a broad sense, the Agricultural Development Corporation (ADC) is meant to be a business-like agency, somewhat similar in structure and purpose to ANERA or CDF. Its headquarters would be set up in Jerusalem, but with the possibility of opening several regional branch offices at a later stage. Unlike voluntary

agencies, the ADC would be business-oriented in order to avoid Israel's strict control on its funding operations and field activities.

The objectives of the ADC would be broad enough to include all projects which involve specialized large scale ventures (hatchery, feedmill, citrus packing plant, olive oil processing ..... etc.) or direct dealing with individual farmers (spraying services, supply of seedlings, loans for trellising .... etc.). As such, the ADC would provide a diversified range of services which are commonly handled by government machinery, cooperative societies, and private institutions. It is believed that if the project was provided by a qualified staff and adequate resources it would be instrumental in advancing West Bank agriculture.

Capital requirements of the ADC are too fluid to be ascertained with reasonable precision. Drawing on the experience of voluntary agencies and comparable institutions in Jordan, it is proposed to allocate JD 0.5 million for the ADC working budget during the first year, to be raised to 0.7 and 1.0 million in its second and third years, respectively. Besides equity capital raised locally, the ADC would try to raise most of the needed funds from foreign sources, whether Arab or otherwise. much of its funds, however, would be subscribed by PACC.

It is proposed to start out the project with the head office of the ADC in Jerusalem, which would be staffed by a manager and two technicians (a horticulturist and a pest control specialist), in addition to a secretary and accountant/auditor.

5.0 Marketing

Marketing problems are probably the most serious deterrents to a more vigorous expansion in commercial patterns of farming, whether they are rainfed or irrigated. Most such problems relating to rainfed agriculture were described earlier under various sections in Chapters 7, 8 and 9, and were later summed up in chapter 10.

The primary objectives of a national marketing policy could be summarized as follows:

1. Improving terms of trade with Israel - although that is out of reach within the present political setting.
2. Easing restrictions on the flow of goods into Jordan.
3. Expanding export potential in the Gulf states.
4. Increasing competitiveness in local wholesale markets in order to reduce monopolies and raise the farmers' share of the consumer's spending.
5. Improving auxiliary marketing services.

The following projects and measures are intended to meet some of these objectives. Other more specific recommendations will be discussed under respective sections in later chapters.

5.1 Establishing the Agricultural Marketing Bureau

Despite the critical significance of marketing problems and services, there is not yet any specialized agency or organization on the Palestinian side which is entrusted with the responsibility of attending to the marketing of agricultural produce in the occupied territories. Marketing services have been reduced to merely regulatory functions which in turn have been thinly spread among several entities, mainly the Ministry of Agriculture and

the Executive Office for the Affairs of the Occupied Territories - both affiliated to the government of Jordan. The duty of both offices is restricted to issuing permits for West Bank products destined for Jordan's markets. They are assisted for this purpose by a team of seven official residents in all West Bank districts who issue to exporters certificates testifying to the Arab origin of goods intended for export to Jordan.

Undoubtedly, the present marketing set-up leaves much to be desired, even at the level of regulating exports to Jordan. A major step in the right direction would be the establishment of the Agricultural Marketing Bureau (AMB) as an apex institution entrusted with problems of agricultural marketing in the occupied territories. The AMB would be established by a decision taken by the Joint Palestinian-Jordanian Committee and would be placed under its jurisdiction in a way similar to that of Palestine Agricultural Credit Corporation.

The AMB would assume and consolidate all duties relative to the flow of West Bank agricultural goods into Jordan. This would include supervizing resident inspectors in the occupied territories, issuing permits, and running entry inspection terminals on the Jordan side of the bridges. The suggested change in permit issuing mechanisms will hopefully help expedite the flow of Palestinian goods into Jordan and attend to several loop-holes in the present system.

In addition to its regulatory functions, the AMB would try to expand the export potential of Palestinian produce. This would involve launching an aggressive campaign aimed at exploring new markets and expanding old ones. The AMB should use for this

purpose all sorts of modern promotional techniques, especially short films taken on Palestinian soil. In addition to advertizing the superior quality of produce, promotional campaigns might even emphasize the political connotation of the so far un-exploited slogan of "Buy Palestinian to help Palestinians stay at home"!

The PLO can certainly exercise some influence in negotiating for better terms of trade with friendly partners, especially as most of them are making little progress in meeting their food shortages. It might be appropriate to annex commercial attaches to some of the PLO's offices in the Middle East.

The researcher cannot give a detailed statement on the administrative and financial consequences implied by the suggested structural reshuffle and the establishment of the Agricultural Marketing Bureau. Such an assignement should be delegated to an exploratory team of experts designated by the Joint Committee itself.

Although the AMB is viewed as an important addition to Palestinian's pre-independence infrastructures, Jordan would still be able to safegard its interests through its effective partnership in the Joint Committee. Accordingly, it would be unlikely to veto the proposed structural change in marketing arrangements.

5.2 Exercising tighter control on wholesale markets

The largest proportion of farm products going into agricultural trade are handled through wholesale markets of fruit and vegetables in neighbouring towns, such as Tulkarm, Qalqilia,

Jenin, Nablus, Halhoul and Hebron. Although wholesale markets are usually owned by local municipal authorities, most of them operate under minimal control from respective municipalities.

While middlemen in West Bank markets enjoy a relatively weak monopolistic position in comparison with other countries of the Middle East, there is still ample room for improvement. Wholesale handling of agricultural produce could be rendered much more competitive by instituting adequate regulations to curb monopolies and eliminate swindling. It may be helpful to learn more in this regard from the successful experiences of the Amman and Nablus wholesale markets.

5.3 Exploring the potential for selective agricultural industries and expanding cold storage facilities.

Development of West Bank agriculture, as will become clear in later sections, will entail a marked increase in the supply of many farm products. Oversupply problems can be effectively alleviated by setting up industries which take advantage of seasonal surpluses and by holding part of any excess supply in stores until subsequent improvements in the market situation.

Establishing successful agricultural industries and cold storage facilities should be preceded by adequate studies on the supply and demand dynamics of farm produce and of the market potential for processed products and storage services. As a first step in this regard it is proposed to commission a team of experts to conduct a full-fledged feasibility study for establishing appropriate industries and cold storage facilities in surplus areas. Such studies could be sponsored and financed by the Rural Research Centre at An-Najah University.

5.5 Improving auxilary marketing services of agricultural products.

Most farm products are offered for sale with either little or poor quality services performed during the marketing process. Many such examples were cited earlier under olives, dairy and poultry products. Such problems are as severe in the case of citrus and vegetable products. Suggested improvements will be discussed later under relevant sections in Chapters 12, 13 and 14.

6.0 Land reclamation

This project aims at reclaiming land in classes III and IV and putting it under active cultivation. This involves a number of complementary measures, mainly the following:

a. Land development (removal of rocks and construction of retaining walls).
b. Opening passable roads.
c. Reconstruction of cisterns.
d. Distribution of appropriate fruit tree seedlings.

6.1 Establishing regional land development units.

Land development should be handled by regional units equipped with a collection of heavy machinery such as bulldozers, graders, and trucks. The services of these units would be made available to farmers at a subsidized cost, preferably not exceeding half of market rates. Ownership and management of proposed units could either go to existing regional cooperatives (as has already been done in Hebron and Nablus) or, if no cooperatives are available, to private entrepreneurs. In both cases the finance would be made available by the PACC within an arrangement which gives a sufficient incentive to owners of these units. It is proposed to start by establishing three such units located in

Azzoun (Tulkarm district), Beit Jala, and Deir Ghasseneh (Ramallah district). Two similar cooperatives are already established in Nablus and Hebron. In the light of accumulated experience several more reclamation units should be established in other areas.

In order to present a clear picture of the proposed project, the following is a list of capital requirements and operational costs for a model land development unit[1].

[1] Derived from: ANERA's Proposed Projects for Fiscal Year 1980, pp. 45 -52.

Capital requirements per reclamation unit:

Land and buildings	JD
Land 5 donums	5,000
Buildings 500 square meters	5,000

Machinery	No. of units	Market value (JD)
Bulldozer, D 9L	1	20,000
Grader	1	15,000
Carrier truck	1	10,000
Belt Tractor	1	8,000
Wheel tractors	2	7,000
Pick up	1	5,000
Trolley and other items		2,000
Total		67,000

Personnel		Salaries (JD/year)
Manager (agricultural engineer)	1	3,000
Accountant	1	1,800
Mechanics	2	3,600
Drivers	4	5,800
Clerk	1	800
Watchman	12	800
Total		15,800

Estimated operation costs	JD/year
Administration (salaries plus other expenses)	17,000
Maintenance	4,000
Fuel and oil	7,000
Depreciation	6,700
Miscellaneous expenses (10% of total)	3,300
Total	38,000

6.2 Development of cisterns in reclamation areas.

This project aims at assisting farmers to reconstruct deserted cisterns or dig new ones in areas where rainfed farming is to be developed in the context of subsequent projects. The reconstructed cisterns would be expected to have a tremendous impact on the pace of development, whether by supplying water needed for livestock, or for spraying purposes (mentioned frequently in subsequent projects), or for supplemental irrigation of fruit trees (see 8.4 below). This project would also help conserve more of the wasted runoff water and eventually reduce the dangers of top soil erosion.

It is estimated that the reconstruction of a deserted cistern would cost around JD 200 and the construction of a new one about JD 500. Interested farmers would cover half of the needed costs and receive the rest as a grant. Due to the limited nature of this project it is proposed to have it already engaged in a similar project in the east Bethlehem area. The ADC could play an important supervisory and funding role.

6.3 Developing agricultural roads.

Development of agricultural roads to a level where they become passable to tractors and vehicles would be another important step towards facilitating rapid growth in rainfed agriculture. Furthermore, this would help disseminate construction of houses in areas where farming was reactivated. The project should be restricted to cases where no land disputes are likely to emerge between farmers bordering anticipated roads, lest this be utilized by the occupation authorities in obstruting construction works. The opening of roads would be undertaken by land

reclamation units mentioned earlier (5.1).

The need for agricultural roads is extensive and should be phased in over many years, depending on the availability of funds and the attitudes of the Military Administration. Tentatively, it is felt neccessary and reasonably possible to re-develop around 100 kilometers of roads annually during the next three years at an approximate cost of JD 2400/km. Benefitting farmers would cover half of the cost and the rest would be provided as a grant, whether from voluntary agencies or PACC (see 4.1). Field processing of applications would be entrusted to representatives of PACC in respective districts.

6.4 Distribution of tree seedlings.

Land reclaimed and developed in the context of previous projects would be utilized essentially for growing fruit trees, mainly olives and grapes. A part of the proposed package would be to promote distribution of seedlings at a scale wider than currently done by voluntary agencies. This project will be elaborated further under the section on fruit trees.

6.5 Dissemination of mechanized services fit for hilly slopes.

The objective of this project is to make available at reasonable charges a carefully selected range of mechanized services through specialized custom units. The services would include ploughing, seedbed preparation, pruning, and spraying (insecticides, weed killers, hormones ..... etc.). The project obviously bears on land conservation as well as on other important prerequisites of development. It would help improve productivity, reduce operational costs and raise net family income from rainfed farming to a level sufficiently viable to justify recruiting hired labour

in this type of farming.

A large number of such machine service units are needed, but it would be prudent to start out with 10 units and establish 15 more annually during the subsequent two years. Each unit would serve two to three villages. It is strongly recommended that the ownership of machinery go to private entrepreneur(s) and not to large cooperative groups. Owner-operators would be recruited mostly from eligible graduates after receiving adequate training in farm machinery. Prospective owners would be provided with the needed capital by the PACC at concessional terms, on condition that they render their services at reduced rates agreed upon with PACC. A recent study by ANERA has revealed that the benefit/cost ratio for such a project is 1.375*, which is still attractive enough even though the wages of owner-operators are accounted for at market rates.

The collection of machinery in each service unit would consist of the items listed below:

	Cost (JD)
Medium size wheel tractor	7,000
Small size orchard tractor	4,000
Stationary motor sprayer (2)	500
Knapsack motor sprayer (5)	1,000
A harvester and stationary thresher	2,500
Cultivators, ploughs, trolley	2,000
Total	17,000

* ANERA Project Book, 1981. p. 124.

7.0 Water

This study, as mentioned earlier, will not deal with irrigated patterns of agriculture. The researcher believes, however, that much more could be done towards exploiting a larger proportion of rain water through terracing, construction of cisterns, and growing of fruit trees. Measures to be taken in this regard have been discussed in relevant sections in this chapter.

CHAPTER XII

CHAPTER XII

THE DEVELOPMENT OF FRUIT TREES AND CROPS

The development of fruit trees occupies a prominent position in the suggested scheme for reactivating rainfed farming. The reasons for this strategic choice are several. There is no better alternative for exploiting West Bank rocky hills, whether from an economic point of view or in the light of their favourable impact on soil and water conservation. Furthermore, tree culture imposes less strain on the technological aptitude of peasant farmers and also leads to a deeper attachment between farmers and their land.

Development guidelines for fruit trees

The discussion on the economic setting of major rainfed fruit trees (see Chapter VII) points to a number of important features, which are summarized below:

A. Olives

Olives are by far the most important tree in terms of area and income. Furthermore, olive products (mainly oil) are much more important than all other types of tree produce as a staple diet for local communities. Consequently, a substantial expansion in production is not expected to cause a glut in local markets, because in the end producers are willing to store excess produce for future consumption in off-years. Being the most hardy and longest living of all fruit trees, and in view of the availability of a large supply of marginal land (classes III and IV), expansion in olive plantations is strongly advocated. This is further justified for political reasons, since the presence of a tree coverage could help complicate and impede Israel's settlement policies.

Taken on purely economic grounds, olives are still remunerative,

given the present setting whereby they involve land and labour which have very little opportunity costs. And in the event that net returns from olives decline sharply or turn into a loss, olive orchards could be temporarily abandoned and considered as forests, and possibly put under natural grazing. Should there be a change in the market structure, deserted orchards could be conveniently rejuvenated and put again under commercial production.

Comparing olives with grapes and almonds, which are the closest substitutes, olives are evidently less remunerative than both (see Table XII-1). But olive culture entails several other non-pecuniary advantages which still make of it the leading tree in West Bank agriculture, despite modest immediate returns.

Table (XII - 1)

Comparative profitability of olives, grapes and almonds

	Net returns (JD/don)*	
	Good year	Bad year
Olives	18.2	-3.3
Grapes (creeping)**	48.7	--
Almonds	28.3	4.2

* On the basis of excluding the value of unpaid labour from cost outlay.

** Returns for an average year.

Source: Data in Chapter VII.

Profitability of olives could be substantially improved if production costs are further reduced and if productivity is raised to the level permitted by existing constraints. The following is a list of guidelines which are suggested in the light of the expansionary and cost-oriented policies outlined above:

1. Wider distribution of subsidized seedlings produced by certified nurseries. This involves patching of existing orchards, but

more so the establishment of many new orchards. A narrower spacing is strongly recommended for a number of economic reasons, such as reducing water evaporation in the summer, and maintaining trees to a size which is low enough to facilitate picking.

2. More vigorous development of land in classes III and IV with the objective of putting more land under olives. This should involve only basic development measures, in addition to the opening of farm roads which are fit for tractors, and possibly lorries.

3. Low-key modernization of production practices, particularly chemical weed control, small tractor ploughing, limited fertilizer use, and the application of picking hormones. The aim here is to raise productivity and reduce production costs within the constraints imposed by prevailing socio-economic parameters.

4. Selective reclamation of cisterns in expansionary areas. These would provide water which is critically needed for such purposes as irrigation of new seedlings and spraying of weed killers and picking hormones.

5. There is an urgent need for a number of improvements in the processing and marketing of olive oil. The needed measures should aim at improving such services as refining and grading of oil, more attractive bottling, certification of quality, and promotion of export trade.

6. Interplanting olive orchards with almonds is strongly discouraged. Alternatively, young olive orchards can be interplanted with creeping grape vines, which have a shallower root system and

do not compete with olives for air space.

B. Grapes

Grape production is unique in West Bank horticulture as being the closest to a highly commercialized and intensive type of farming. Consequently, it is potentially highly remunerative, but at the same time it is noticeably vulnerable to problems of marketing. At such, though a fundamental objective of a policy for grapes should be oriented towards further horizontal expansion, this should be done on such a selective scale that it does not result in depressing prices. The following policies are suggested:

1. Expanding of trellised vineyards in the Hebron-Bethlehem grape corridor.

2. Gradual but massive replacement of vineyards from a wider assortment of varieties (mostly late-maturing) which are grafted on Phylloxera-resistent root stocks.

3. Accelerating modernized production practices in vineyards under intensive production in southern districts.

4. Expanding vineyards of late varieties in the upper hills of Ramallah and Nablus districts, and of early varieties in the Jordan Valley. In coastal districts, grape production could be very profitable if under irrigation. However, this presupposes an advanced level of cultural practices.

5. Introduction of grape processing and cold storage facilities.

6. Lobbying more forcefully for larger and more secure markets.

C. Almonds

The almond should play a significant role in the present context of West Bank agriculture, because of its immediate relevance to

the two critical issues of land use and the raising of income received by poorer segments of the population. Therefore, the major components of an almond policy are:

1. Unconditional dissemination of almond plantations in all land in classes IV and V. This could be accomplished easily through campaigns of sowing bitter almond seeds. Voluntary work camps of students could play an important role in this regard.

2. Emerging seedlings can be left ungrafted when land quality is too low or when other constraints do not permit a reasonable level of husbandry. Otherwise, young seedlings should be grafted with sweet varieties.

3. Provision of almond orchards with more intensive care in the form of fertilizers, weed killers, and insect control. The aim is to raise productivity to the extent permitted within the present socio-economic constraints.

4. Imposition by Jordan of effective restrictions on almond imports from other countries. This is strongly justified on economic as well as political grounds.

5. Restructuring of the almond trade in a way which permits a stronger bargaining power for growers and the loosening of present cartels.

D. Plums

This tree has considerable potential, since it suits a wide range of land and climate and is relatively less vulnerable to pest damage than almonds, figs and apricots.

The major limitation on a more prosperous plum farming relates to problems of marketing, particularly more so because it is essentially a market-oriented commodity. The introduction of a wider range of varieties and the possible establishment of a viable agricultural processing industry might help alleviate occasional surpluses in supply.

Production and distribution of certified seedlings on accredited nurseries would help accelerate rapid expansion in plum plantations.

E. Figs

Given the present price structure, figs are potentially more remunerative than most other types of rainfed trees. This is facilitated by a boost in the price of figs due to a sharp decline in supply and the strong demand in Israeli markets.

The most important cause for the marked decline in fig production is the rapidly expanding infestation with scaly insects, and to a lesser extent stem borers. The first of these insects is easy to control through regional campaigns.

The major line of policy in regard to fig culture, therefore, is to rejuvenate infested orchards. The next step would be the distribution of seedlings of desirable varieties at a commercial and household scale. A greater proportion of the increased produce could be consumed by the very large number of farm families who have become increasingly deprived of this commodity.

F. Apricots

Apricot culture is well suited to large areas in the West Bank, and it is a highly profitable tree, if problems of marketing and

pest control are attended to.

There is an unqualified consensus on the need for expanded growing of apricots. But emphasis should go on the dissemination of the Hamawi variety which can stand shipping constraints and commands prices well above those of the Baladi variety.

The major constraint for expanded production is the lack of seedlings and the need for a more effective control program of stem borers.

G. Introduction of new kinds of trees

The foregoing discussion has concentrated on six types of trees which dominate rainfed orchards. Due to a rather diversified climate and topography it is still possible and even recommended to introduce other types of trees which may prove particularly profitable in the present West Bank setting. This would help reduce the risks of seasonal variations in output (as in olives) and pest damage (as in almonds). Furthermore, some of them may prove more remunerative than traditional types of agriculture. Some of these trees are not totally new, like apples and peaches, whereas others are quite new and require further testing. This includes pistachio nuts, whose seeds are in strong demand and command very high prices.

The major limitation on a vigorous expansion of new types of tree plantations is the unavailability of needed seedlings. Another problem stems from the lack of satisfactory expertise in growing recommended "new" trees. Much could be done to help solve both problems.

Proposed projects

8.0 Fruit trees - olives.

8.1 Wider distribution of seedlings.

Olive seedlings are currently distributed at the scale of 200,000 seedlings per season. This plan calls for doubling the number of seedlings grown annually during the next three years. Most of distributed seedlings would go into new orchards (mainly in Hebron district) but many of them would be used in patching existing orchards in order to raise their productivity and render investment in improved cultural practices more feasible.

Due to the experience they have acquired in recent years, it is proposed to entrust the proposed programme to the MCC and CDF.* The cost of seedlings would continue to be subsidized at the rate of 33 percent. Extra funds needed for this purpose would be allocated by PACC and channelled through third parties.

8.2. Raising the production capacity of producing nurseries.

Olive seedlings are produced currently in three nurseries, one in Nablus (Abdul-Hadi) and two small nurseries in Jenin district. The former has a production capacity of 450,000 and the other two produce around 150,000 seedlings. Much of the produce of Abdul-Hadi's nursery is sold in Jordan where it commands higher prices. A fourth nursery has been recently constructed in Hebron district as a side-project

* MCC: Mennonite Central Committee
CDF: Community Development Foundation.

of Hebron's Agricultural Marketing Cooperative. Anticipated capacity is 100,000 seedlings.

It is proposed to help the Hebron nursery expand its capacity to 200,000 seedlings per year, which may cover the entire needs for that district. Likewise, it is suggested to assist the two nurseries in Jenin raise their capacity to 250,000 seedlings. The fourth nursery (Abdul-Hadi's in Nablus) is viable enough - both financially and technically - to cover its own needs for further expansion. By helping smaller nurseries expand their capacity it would be possible to reduce monopolistic advantages prevailing currently in the olive seedling market.

8.3 Rejuvenation of aged olive orchards.

The most important single cultural operation needed by old olive trees is rejuvenation pruning. This practice is very helpful in reinvigorating old trees and raising their productivity, in addition to reducing the cost of picking by trimming tree size to a manageable height. Although farmers are well aware of these advantages, they believe that the cost of pruning (which is usually done by power chain saws) is excessively high. Consequently, rejuvenation could become much more popular if costs were subsidized.

The suggested programme calls for the dissemination of chain saws through a wider range of potential operators, such as cooperative societies, service units (see 5.5) and eligible individuals. Owners would be provided with the needed

equipment at about half of its market price. Likewise, the cost of sawing (fuel and labour) would also be subsidized at a rate of around 50 percent. The project would be administered by the CDF, MCC and/or ADC (see 4.5). Interested farmers could apply for this service through local extension agents or through direct contact with the agencies mentioned above through an arrangement similar to that of seedling distribution.

8.4 Supplemental irrigation of olive trees.

West Bank olives are totally dependent on rainfall for their water needs, in contrast to the more famous olive producing countries such as Spain, Italy, Greece, California and some parts of Israel. While olives can produce widely varying yields when they are totally dependent on rain water, their yield could be substantially raised and stabilized by providing them with small quantities of water two or three times a year (July, August, and September). This, however, is not intended to put olive orchards under irrigation in the usual sense, since that is clearly impossible.

The suggested project calls for providing those olive trees close to cisterns with about 60-100 litres of water three times during the summer months. As such it would be possible to serve 20-50 trees from a single cistern. Water would be lifted by a portable pump, used otherwise for spraying purposes (see 8.6), and carried down by gravity to surrounding trees.

With the large number of cisterns scattered all over the

country, and as a result of active efforts to develop more cisterns, the suggested project might eventually help reach a large number of rainfed olives. Its positive impact includes a pronounced multiplier effect on such cultural services as fertilizer application, pest control, and pruning.

In the long run, this might even turn out to be a breakthrough in West Bank olive culture.

8.5 Application of chemical fertilizers.

West Bank olive growers add little or no chemical fertilizer. This is quite contrary to the strong recommendations made by olive experts at the Volcani Institute who recommend liberal use of nitrogenous and potassium fertilizers.*

Based on observations gathered from local technicians and leading farmers, the researcher believes that a mild use of fertilizers is advisable and may lead to highly favourable results. This could be achieved through vigorous educational efforts of extension agents and other technicians employed by voluntary agencies, ADC, and cooperative societies. The process could gather effective momentum by conducting a number of demonstrations in selected areas. It is not suggested, however, to subsidize the cost of fertilizer for fear of causing problems in the price of fertilizers used

* This information was derived through personal contacts with the staff of the Olive and Grape Institute at Volcani.

in other types of farming.

The suggested demonstrations could be adopted by the Agricultural Development Corporation with the assistance of district extension offices.

8.6 Reducing tillage costs.

Ploughing accounts for one to two thirds of total production costs. Therefore this should be a primary target in the efforts to reduce production costs.

The suggested project comprises three main measures:

a. Reducing the number of ploughings to one (instead of two or three), which would take place in early winter.
b. Introduction of small orchard tractors which are fit for use in olive orchards.
c. A much wider use of weed killers.

The first measure could be accomplished through extension education, and many farmers have already reduced the number of ploughings to one or two. The second measure would be rendered possible through the machine service units mentioned earlier (see 5.5) or by providing eligible farmers with loans to buy the prescribed types of tractors. The loans should be advanced, at concessional interest, by PACC through its regional offices.

Chemical control of weeds has since long passed the experimental stage in some areas. In view of extensive experienced acquired during the course of this research and through consultations with experts, it is recommended

to spray weeds in late March through early April with a non-selective weed killer.* By spraying them at this time it is possible to kill weeds before they grow too high or reach the seeding stage, and at the same time the operation takes smaller quantities of spray. Another important advantage for this practice is that dry weeds will serve as a cover mulch for soil during the hot and dry summer months, which is effective in conserving soil moisture.

Depending on experience accumulated after the project is launched, the researcher does not dismiss the possibility of terminating the ploughing in of olive orchards and resorting to herbicides for the purpose of controlling weeds. In that case the first ploughing would be replaced by spraying land with a pre-emergence weed killer in late November (most common are Simazine or Diurex), and a post-emergence weed killer in March. While this may look like a major transformation in West Bank agriculture, it has become an ordinary practice in many parts of the United States and Israel.

The suggested project calls for making the spraying service available at a subsidized rate through machine service units (see 5.5), cooperative societies and the Agricultural Development Corporation. Capital needs for purchasing of equipment are included under projects relative to above-mentioned institutions, but the amount of working capital is estimated below. Estimates are based on the assumption

* The one most commonly used and with noted success is Ducalton of ICI.

that the area to be sprayed would be 50,100, 150 thousand donums respectively during the three years of the plan. Subsidy appropriations would be derived from the PACC or voluntary agencies.

8.7 Localized treatment of diseases.

Despite widespread infection with several insects and diseases, it is not realistic at the present to envisage a comprehensive control scheme. It is recommended to launch a programme of localized treatment in orchards which suffer severe infections of Peacock eye spot and Lichens, both of which are effectively controlled at a reasonable cost by using copper sprays. The process would be totally sponsored at the demonstration level, but only partially subsidized on a commercial scale, and would be undertaken by the same institutions as mentioned earlier in similar projects.

8.8 Gradual introduction of picking hormones.

The picking of olives by using special hormone sprays has not yet been a complete success. The cost of picking is too high, ranging from one half to two thirds of manual picking, which means that their use has to be evaluated individually in each orchard. Nevertheless, it is still possible that picking by hormones may result in substantial savings in good seasons, the incidence of which is about once every three years.

The proposed project calls for the gradual dissemination of picking hormones in good years by providing the spraying service at a subsidized cost. The service would be made available through the same infrastructures mentioned earlier

in 8.6 above. A number of demonstrations would have to be organized in strategic locations. The cost of spraying would also be subsidized by the PACC or voluntary agencies.

8.9 Selective modernization of olive presses.

All olive presses in operation are of mechanical types, but they vary considerably in their labour requirements and oil extraction rates. Although a lot should be done to modernize old presses, the trend towards the ad hoc establishment of very modern automatic presses is highly questionable. Such presses require an exorbitant capital outlay (around JD 100,000 each) which is hardly justified on economic grounds. In good years, the olive pressing season extends for about two months, but in most years for a shorter period.

The suggested scheme regarding olive presses comprises the following measures:

a. No credit facilities to be advanced for the construction of modern presses except after a positive feasibility study is conducted by the Rural Research Centre or the Agricultural Development Corporation, and in that case capital needs to be met mainly through equity subscriptions from owners, supplemented by loans from PACC.

b. Owners of existing presses urged to modernize parts of their machines (examples: adding washing units and spreaders of crushed olives, raising engine compression, and improving efficiency of centrifugal equipment). It is

possible to modernize any one or more of these processes without having to scrap the entire outfit and replace it with a new one.

c. Intensive research to explore the possibilities of operating modern presses for purposes other than olive oil extraction.

8.10 Introduction of modern oil tinning techniques.

The present system of processing and tinning of olive oil has limitations. Most importantly, quality is not adequately controlled and standardized, and the size of cans is too large (around 17 kilograms).

The suggested project calls for a gradual but substantial improvement in olive oil processing and bottling techniques by establishing modern plants in major production areas. Each plant would be equipped with a refining unit and other equipment needed to classify oil into 2 - 3 grades. Edible oil would be bottled in tin cans of various sizes and labelled with a distinctive trademark indicating its Palestinian origin. The quality of the oil would be further checked through spot testing carried by the Horticulture Unit in the Rural Research Centre.

It is proposed to start out the project by implementing current plans to construct two such plants, one in Deir Sharaf (Nablus-Tulkarm-Jenin junction) and another in Ein Sinya (Ramallah district). Both locations are strategic centres for olive production, and in both cases the projects are undertaken by olive pressing cooperative societies. In the future, it may be possible to establish

more such processing units.

As for oil sold through other channels, it is recommended to have it tested and certified by the proposed plants at a reasonable fee. At some time in the future it might be possible to restrict all exports through accredited processing units and the Agricultural Marketing Bureau.

9.0 Grapes

Despite slight risks of overproduction, it is proposed to adopt an expansionary policy of grape production for reasons of paraeconomic significance. The new policy should also aim at minimizing costs especially those paid in cash. Precautionary measures should also be taken in anticipation of excess supply.

The following list of projects is proposed in relation to production and marketing.

9.1 Wider dissemination of seedlings.

The suggested plan envisages a substantial expansion in the area under grapes. Some of the new vineyards would be planted in southern districts (Hebron-Bethlehem), but most of them will be grown in the Ramallah and Nablus hills. Furthermore, a large number of vines would be needed for interplanting within young olive orchards, in preference to almonds or other trees.

Although direct growing of cuttings could be accelerated and modernized by delegating production of seedlings to specialized nurseries. In this way it would be possible to introduce a better and wider selection of varieties, graft parts of the seedlings on the phylloxera-resistent

root stocks, and produce sufficient volume of seedlings to cater for the relatively large needs of newly established vineyards. Furthermore, by using rooted seedlings instead of fresh cuttings, farmers would be able to gain one year on the interval needed for maturity of new vines.

It is proposed to entrust production of rooted cuttings to the Hebron Cooperative's olive nursery and to Abu-Ghazeleh's nursery in Nablus district. Distribution of grape seedlings would be subsidized and handled by voluntary agencies in ways similar to current arrangements for olives.

9.2 Expansion of trellised vineyards.

The trellising of vineyards is a major breakthrough towards raising productivity and increasing profit margins, but an important deterrent in this regard is the high capital requirement.

Trellising could be accelerated by offering cheap loans to eligible producers, i.e. those who are qualified to provide the high level of intensive husbandry practices needed by the new technique. Consequently, it is proposed to give special priority to experienced farmers in Hebron, Bethlehem and Ramallah. Intensive efforts should also go into the introduction of trellised vineyards in the Jordan Valley and coastal areas, where they could be grown under irrigation.

Loan funds for trellising would be provided by the PACC office in Amman upon recommendation from resident representatives. Voluntary agencies and local cooperative

societies could play an important role in channelling aid and supervising implementation of construction work.

Extra care should go into the selection of proper vines in trellised orchards. Late maturity is an important characteristic to consider, in addition to resistence of rootstock to Phylloxera attacks.

9.3 More efficient pest control.

Problems of grape pests were discussed earlier. Improvements in this regard aim at the following:

a. Introducing more efficient equipment, especially in southern districts.
b. Disseminating more effective control measures in northern districts where pest hazards are notably high.

A substantial improvement in pest control techniques could be achieved by stepping up extension efforts and credit facilities aimed at assisting individual farmers to do the spraying themselves by using better equipment and chemicals. But a sharp improvement in the effectiveness and efficiency of pest control (of grapes and other crops as well) is possible by making the needed service available at reasonable fees through local custom servide units. Spraying services would be provided by nearby mechanical service units (see project no 6.5) or local cooperative societies.

The capital needs for establishing custom spraying units were detailed earlier under relevant projects. Due to the relatively high profitability of grape production, the cost

of spraying vineyards would be covered by producers themselves without the need for further subsidy.

9.4 Processing of grape products.

A large part of the increased supply should be processed into other products which may have a good market potential. In addition to wine, grapes may be used to produce jam, syrup, juice, raisins and malban.

It would be very unlikely that a wine factory would be established in Hebron district, but a lot more could be done to support existing wineries in neighbouring Bethlehem district. Most importantly, it is proposed to introduce more effective ways of by-passing religious inhibitions still observed by most farmers. The fact that most of the West Bank grapes sold in Israel is channelled into wineries is perhaps an encouraging sign!

As for the introduction of other industries, the problem is much more complex. Past attempts met little success due to the erratic supply of grapes and occasional boom in prices of table grapes. But there is a firm conviction that over-supply is imminent in the future, and the need is growing for precautionary measures. Besides the need for a more vigorous marketing policy (see 5.1) the problem of a larger supply could be offset by the construction of cold storage facilities and grape-based industries. A feasibility study for both purposes was suggested earlier (see 5.3 and 5.4).

10.0 Almonds

In view of the policy guidelines outlined earlier in this chapter, the following projects and development measures are suggested.

10.1 Dissemination of almonds as a forest tree.

Some varieties of almonds (especially bitter and hard-shelled) are probably tolerant to rugged topography even more than olives - although their longevity is admittedly much less. But almonds have the additional advantage of being much easier and cheaper to propagate, since that is possible merely by direct sowing of seeds.

The suggested project aims at extensive sowing of almond seeds in land of classes 4 and 5. At worse, emerging trees could be considered as forest plantations which would yield much higher returns than alternative forest trees. The prospect remains open, however, that wild almond orchards could be rehabilitated to a commercial status by providing a limited amount of cultural practices.

The fact that most of land area in marginal categories has become after occupation of a controversial title should not deter the proposed seeding campaign, at least until the military authority expresses its explicit opposition.

Sowing almond seeds is best accomplished through voluntary work committees which have been set up in recent years by university and high school students in most towns and large villages. The financial obligations for this project are relatively modest. The price of one olive seedling would

buy almond seeds enough to plant two donums.

This project could be easily sponsored by voluntary agencies and university student bodies. One possible formula is to have it administered by the Association of Agricultural Engineers (AAE) and the Central Committee for Voluntary Work.

10.2 Introduction of improved varieties

Despite substantial advances, there is only a small number of almond varieties in common use. It has been conclusively demonstrated that better varieties could be successfully introduced by gratfing them on bitter seedlings. The Department of Agriculture started a successful campaign for that purpose early in the seventies, but this was later terminated as a result of budget cuts.

Again the financial obligations for this project are modest. It is proposed to delegate its administration and finance to the Association of Agricultural Engineers, who would have to carry out field contacts through extension agents in district offices of agriculture. The fact that most extension agents are members of the AAE is a prerequisite for their active collaboration, at least with regard to projects which are not vetoed by the Military Administration.

10.3 More effective control of almond pests.

Almond wasp and pear slug constitute a serious threat to West Bank almond culture. The former is best controlled by collecting and destroying dead mummies. The Department of Agriculture stopped an earlier program which encouraged school children and farmers to collect mummies by offering them a nominal remmuneration on collected mummies. It is

strongly recommended to reactivate that program and solicit for that purpose the collaboration of Voluntary Work Committees.

The pear slug, on the other hand, can be effectively and relatively cheaply controlled using systemic insecticides sprayed by powerful equipment. This operation could be easily handled by the Mechanical Service Units mentioned earlier (project 6.5). The cost of spraying could be subsidized at about 50 percent. Both control programmes would be coordinated by the Association of Agricultural Engineers.

10.4 Negotiating better terms of trade with Jordan.

Expansion of production should be accompanied by a forceful lobby for better terms of almond trade with Jordan and other Arab importing countries. This should include increased restrictions on imports from abroad and easing of current restrictions on the flow of West Bank almonds to Jordan. The construction of a second shelling mill in Jenin or Nablus district (there is one in Anabta, Tulkarm district) would help cut down on transportation expenses.

11.0 Other trees.

There is much that could be done to stop the decline in other types of rainfed tree culture. The types of projects needed, as could be inferred from the list below, all fall within the categories or projects described earlier, such as propagation of seedlings, introduction of improved varieties, more effective pest control, wider use of weed killers in replacement of ploughing and more active interest

in problems of over-supply. All recommended measures and programs could be conveniently handled within the framework of infrastructures described in previous chapters; therefore no additional capital outlays would be needed. Should there be a specific interest in any one of the programmes recommended below, a comprehensive study could be undertaken for that purpose by the Rural Research Centre at An Najah University.

11.1-4 Propagation of figs, apricots and plums.

Introducing better varieties for multiplication in nurseries.

Collective control of scaly fig insect.

Wider use of weedkillers through custom service units.

12.0 and 13.0 Field Crops and Vegetables

These forms of farming are versitile and respond rapidly to external factors. Specific projects are not discussed here but these sectors will benefit greatly from many of the general projects described.

CHAPTER XIII

CHAPTER XIII

THE DEVELOPMENT OF POULTRY AND LIVESTOCK

Although problems impeding growth in the livestock and poultry sectors are easy to ascertain, development of these sectors may prove particularly difficult in comparison with other types of rainfed farming. Sheep raising, for instance, is faced with increasing restrictions on grazing land. The producers of commercial scale cow herds find it almost impossible to compete with TNUVA's products. Poultry farms suffer restrictions in the supply of replacement chicks and have to compete with subsidized Israeli produce.

Thus the implementation of a national developmental policy for livestock is more difficult than that of most other types of agriculture, because the ensuing constraints are less manageable. But conforming with the implications of national viability outlined earlier (see Chapter X), there is still ample room for improvement should adequate financial support be provided. This chapter discusses recommended projects and courses of action.

10.0 Poultry

Poultry farming ranks high on the list of priorities because it is an area where West Bankers have a limited comparative advantage, either in the form of expertise or utilization of available low-opportunity family labour. Furthermore, rapid expansion of poultry meat supply is more feasible than beef or mutton, at least in the foreseeable future. But expanding poultry farming is far more demanding on capital than most other types of agriculture. Furthermore, the magnitude of losses in cash, should the market move in the wrong direction, is also much greater. This means, therefore, that expansion in production should be carefully paralleled by a

number of measures to deal with occasional market declines.

10.1 Establishing a chick hatchery.

Due to chronic problems of chick shortages and occasional inferior quality, the cornerstone for stabilizing broiler farming is the establishment of a local hatchery to specialize in producing broiler chicks, with a starting monthly capacity of 120,000 chicks (around 25 percent of current placements). The production capacity would be raised substantially shortly afterwards.

For many practical reasons, it is proposed to open share-holding in the proposed hatchery to poultry farmers, dealers of poultry supplies, cooperative societies, and the Agricultural Development Corporation.

During the early stages of the project, hatching eggs would be purchased from Israeli breeding farms. In the meantime, a few good farms on the West Bank would be persuaded to convert to raising breeding flocks by supplying them with sufficient credit and contracting them for their produce of hatchable eggs at negotiated prices. In other words, the hatchery would be urged not to rely solely on its own egg production capacity. By so doing it would spread the risk more thinly and cut down on its capital requirements. This kind of arrangement has proved itself in most countries in the Middle East with advanced poultry industries, such as Jordan and Lebanon.

Evidently, the proposed hatchery will face competition with Israeli chick suppliers. It is therefore unlikely that it will be able to compete with them without receiving a

direct subsidy on its sale price. If a West Bank hatchery succeeds in providing farmers with good quality chicks at ruling prices and in adequate numbers, then the subsidy might be considered well justified. A detailed feasibility study of this project is being conducted by the Rural Research Centre.

10.2 Provision of subsidized credit facilities.

One important reason why poultry farming has managed to survive during the past 14 years is its minimal use of capital and hired labour. Nothing is wrong with this spontaneous kind of adaptation except that expansion potential in this setting remains exceedingly limited - unless capital is made available at concessional terms. Put bluntly, the problem is not scarcity of capital but reticence to invest it at low returns and high risk. This represents a clear case for distinction between "economic" and "national" viability which was allured to earlier in Chapter X.

Modern poultry farming is a highly capital-intensive industry. Capital is needed for expanding and modernizing existing farms and for building new units. Capital requirements for construction purposes would be provided by PACC upon positive recommendations by resident representatives. Owners would be expected to cover from their own resources about one third of the fixed capital outlay. Furthermore, PACC would not provide them with loans for purchasing chicks and feed. This they would have to arrange with dealers of farm supplies or cooperative societies.

10.3 Improving veterinary services.

Although subdued by more serious problems, disease infections still inflict considerable damage on the West Bank's poultry industry, perhaps more in terms of lower productivity than by direct mortality. Veterinary services, on the other hand, are in decline. A particularly critical problem is the lack of adequate laboratory testing facilities and a subsequent "trial and error" type of treatment.

An important step towards improving and expediting diagnosis techniques would be the construction of well-equipped laboratories in district offices of the veterinary department. It is suggested to establish three such laboratories (Nablus, Ramallah and Hebron) and provide adequate training for their technical staff. The UNDP office could play an important role in tailoring and financing the proposed training program. It might also help finance the installation of necessary laboratories. Otherwise the needed funds should come from a different source, possibly ANERA, since aid from the PAAC might be refused by the Military Administration to which veterinary offices are affiliated.

11. Sheep and goats

Although little can be done to help stop military encroachments on grazing land, a lot should be done in other ways to help raisers of sheep and goats. A fundamental premise in this connection is to extend every possible support for the steadfastness and further expansion of this sector. Because in addition to being notably profitable, sheep raising entails profound social, nutritional and national rewards.

11.1 Improving of natural grazing pastures.

The quality of natural pastures is often poor due to neglect and overgrazing. Much is needed to be done in this regard, but the potential to do so is severely restricted by existing political and administrative hurdles.

Learning from successful trials by ICARDA and in Jordan, pastures could be materially improved by sowing them with a mixture of forage crops which would thrive under marginal amounts of rainfall (over 250 mm). But such a practice requires some vital complementary services, such as restricting access to pastures during the first year and guarding against excessive grazing in subsequent years.

A practical way to supervise such a project in the absence of a national authority would be its adoption by regional cooperative societies. Cooperatives should fence desired plots before sowing them, carry out necessary cultural practices, hire guards to protect germinating pastures against intruders and divide pastures into plots to permit grazing in rotation. Patronizing flock owners would be charged reasonable fees to help cover part of the maintenance expenses.

It is proposed to start out this project with a pilot trial in Hebron or Jenin on an area of some 1000 donums. The area would be rapidly expanded in subsequent years in view of acquired experiences. The expertise of FAO and ICARDA could be of great help. A good start would be to send one or more technicians from each cooperative for intensive practical

training on ICARDA's experimental farm in Aleppo (Syria).

11.2 Promoting forage production on private land.

The Department of Agriculture has demonstrated a pronounced profitability for growing a certain type of forage legume, (Medicago hespida) on cultivable land, possibly instead of grains. Clean fallowing should also be abandoned and land be sown with legume mixtures instead. Furthermore, it may be possible to utilize, for this prupose, land of young olive orchards and emerging plants should preferably be left ungrazed or lightly grazed during the first year.

The resulting forage crop would be very helpful in supporting a larger sheep flock and raising its production potential.

The proposed project calls for a package of services, namely

a. Intensifying extension efforts in eligible areas. This could be done through extension agents and other technicians employed by voluntary agencies, the Agricultural Development Corporation and cooperative societies. Presumably, these agencies would cover needed costs from their own resources.

b. Distributing seeds to interested farmers at subsidized prices. The cost of subsidy would also be undertaken by voluntary agencies or ADP.

c. Provision of mechanized cultural services on farms where area and topography permit. These services would be provided by machine service units mentioned earlier, so no additional capital expenditure would be needed.

11.3 Reconstructing cisterns in grazing areas

Availability of sufficient drinking water may play a critical

role in carrying over flocks to the end of a long and dry summer. Scarcity of drinking water can prove more serious than poor pastures in forcing owners to dispose of a large part of their lamb flock long before reaching a commercial age. The best safeguard for lack of drinking water is the reconstruction of deserted cisterns and the digging of new ones in grazing areas, in a way similar to the current CDF project in Bethlehem district.

This project is part of a more comprehensive scheme of cistern reconstruction in rainfed areas (see project no 6.2). Consequently, no further financial obligations would be needed.

11.4 Promoting commercial fattening of lambs.

Sheep raising could be substantially expanded by reducing early slaughtering of young lambs. Instead, it is proposed to provide sheep raisers and other interested entrepreneurs with the requisites needed for fattening lambs to an average of 40-50 kg. Such projects achieved a remarkable success in the early seventies when they were fostered by the Department of Agriculture, which then provided farmers with production credit and technical assistance. The proposed project is essentially a reactivation of its earlier version.

Interested farmers and other entrepreneurs would be provided with medium-term loans to cover construction costs of needed sheds. They would also receive production credit facilities for covering part of their operational costs. Fattening of lambs would commence in January and extend through May. Farms could be utilized until the following January in raising

broilers or fattening calves. It is reasonable to assume, therefore, that a fattening project of a reasonable size (eg. 100 lambs plus three successive flocks of broilers of 3000 each) would be viable enough to support a full-time college-level graduate. As such, this project should be viewed as a practical option for absorbing a limited number of potential emigrant graduates.

Loans for construction purposes would be provided by the PACC upon recommendations by resident representatives, whereas operational loans would be advanced if needed, by the Agricultural Development Corporation.

11.5 Prolonging the lambing season by hormone injections.

It has been demonstrated successfully that it is possible to manipulate the onset of the (fertility) heat period and raise the frequency of twin births in ewes by using injections of certain reproduction hormones. By so doing it is possible to spread the lambing season throughout the entire year instead of restricting it to only a few months and at the same time produce a larger number of lambs. The economic returns from this innovation are potentially very great, but its widespread dissemination in the West Bank is impeded by inadequate extension and veterinary services.

It is proposed to adopt a program aimed at introducing the new technology on a wide scale. This would require launching a vigorous extension program involving all concerned groups such as the Veterinary Department, extension staff, voluntary agencies and cooperative societies. The cost outlay for the needed campaign would be covered by the Agricultural

Development Corporation or Voluntary agencies.

Lambing regulation treatment should be made widely available through local extension agents, some of whom have already been trained in Israel. It is recommended to have more people trained for this purpose, who are to be selected from among the staff of cooperative societies. Part of the work would be undertaken for demonstration purposes without charge, but most of it against a subsidized service fee (the current fee is JD 1.8 per head).

11.6 Promoting " Assaf" sheep raising in in-door patterns of management.

Although Assaf sheep have a considerably higher production potential than Awasi, their tolerance to the rugged patterns of rough grazing is much lower.

The profitability of raising Assaf sheep in-doors has been conclusively demonstrated, both in Israel and in the West Bank itself, yet such projects have not taken off on the West Bank due to inadequate credit and extension services. It could be effectively disseminated, however, by providing eligible farmers with loans for construction purposes and buying replacement ewes. Construction loans would be procured from the PACC, and those for operational purposes from the Agricultural Development Corporation. Owners should contribute a minimum of one third of total capital outlays.

16.0 Cows

While there is still ample room for peasant-type dairy farming where labour is free and out-of-pocket expenses are squeezed to a minimum, large scale commercial farms are hopelessly non-viable. The cost of production will remain too high to compete with heavily

subsidized Israeli milk products, against which West Bank produce has no compensating quality advantage. When it is possible to exercise sovereignty on the West Bank's economy it will then be necessary to reconsider the situation of commercial dairying in the light of more favourable realities. In the meantime, however, some measures could be taken to assist peasant cow raising, as will be described in the two following projects.

Beef projects pose a different situation. Due to high prices of red meat and consumers' reticence to buy meat slaughtered in Israel, locally produced beef commands a distinctive quality advantage. Trials on dry lot fattening of calves (Jenin district) are encouraging, but more testing is needed.

12.1 More efficient insemination services.

In its effort to reduce its budget, the Department of Agriculture has terminated its free artificial insemination service. This has rendered artificial insemination less reliable and considerably more expensive.

It is proposed to entrust the AI service to regional cooperatives who would charge fees on a non-profit basis. Each unit would be equipped with needed facilities and would be operated by a trained technician. Five such units are needed. Insemination technicians would perform this function as a partial assignment, since they would be originally hired with a broader mandate as livestock extension agents.

Capital requirements for AI units would be provided by sponsoring cooperatives themselves.

12.2 Providing loans for upgrading of replacement stock.

About three-fourths of all cows are of Baladi strains, which are characterized by a relatively low productivity. Freisians are almost as well adapted to local conditions, but they are much better producers of milk and meat. Heifers of certified strains are available in local and Israeli markets, but the main reason for not moving more heavily to Freisians is their considerably higher cost.

The expansion in the population of Freisian cows in peasant herds could be accelerated by providing adequate loans at concessional terms. Lending for this purpose could be delegated to local cooperatives or voluntary agencies.

CHAPTER XIV

CHAPTER XIV

THE DEVELOPMENT OF WEST BANK AGRICULTURE - DISCUSSION AND CONCLUSIONS

The development of West Bank agriculture inevitably occupies a significant position on the agenda of Palestinian strategists. A more developed agriculture would not only involve conventional economic gains, but it would also bear heavily on basic features of the Palestinian-Israeli conflict. This research has attempted to evaluate present constraints and problems limiting agricultural development, and then provide politicians as well as concerned agencies with specific developmental proposals. In this context Chapter 1 defined the objectives of this study, discussed its methodology, and reviewed pertinent literature.

Geographical background

The West Bank is handicapped by a unique geography which results in severe constraints on its agricultural potential. This is manifested by such attributes as an exceedingly rough topography, excessive rockiness, irregular and strictly seasonal rainfall, and frequent occurence of very hot weather. Geographical attributes have severely limited the area of land fit for irrigated farming and resulted in excessive dependence on rainfed patterns of agriculture.

Important aspects of human geography have also been discussed and evaluated in respect to their impact on the process of agricultural development.

Resource conflict

The history of Palestine has led to sharply conflicting claims between Palestinian Arabs and Jews. Soon after Israel occupied

the West Bank and Gaza Strip in June 1967, it began implementing a policy involving evacuationary and colonial elements. Notwithstanding some differences in timing and methods to be used, all Israel's major political parties now look forward to annexing the West Bank and Gaza Strip to the state of Israel.

The acquisition of West Bank land now lies at the heart of Israel's policies, and legal loopholes in current forms of ownership are effectively exploited. When no such legal methods of acquisition exist the Military Administration resorts to the needs of security as justification for land acquisition. In contrast, long term forms of land use by local residents, such as urban uses and fruit tree orchards, are openly hindered.

Water resources have also been subjected to large-scale exploitation by Israel, leaving only a minority of ground water resources for use by local citizens. Consequently, horizontal expansion in irrigated farming is limited merely to the prospects of saving on water use by using more efficient irrigation techniques.

Transformations in the labour market represent an unusual but important example of resource conflict. While giving priority to evacuating the maximum number of certain sectors of the local population, Israel has initiated many transformations in the labour market which result in more than 40 percent of the West Bank's labour force becoming subservient to the Israeli economy. The major source for the supply of labourers drawn into Israel is rural communities engaged in dryland agriculture.

Israel has utilised the authority it enjoys as an occupying force to expedite a tighter control and exploitation of various West

Bank resources. This includes restrictive policies on all institutions bearing on agricultural and economic development, such as extension, education, research, cooperatives, finance, and trade relations. It has further stretched its control to cover voluntary agencies and Arab sources of aid funds.

Annexationary policies within the occupied territories were met with little more than verbal opposition until the late seventies. But from 1978 the situation changed following the establishment of the Palestinian-Jordanian Joint Committee and the increasing involvement of voluntary and UN agencies. But all those concerned with the future of West Bank Arabs were confronted with the unusual dilemma of having to evade Israel's policies which are openly hostile to any change which may jeoperdize its own interests. Furthermore, these agencies have suffered marked shortages of the data and information necessary in ascertaining the development needs of the occupied territories.

The critical place of rainfed farming

West Bank agriculture is characterized by pronounced dominance of rainfed patterns of farming. The area under irrigation amounts to no more than 5 percent of all cultivated land, and as this is due mainly to such rigid factors as rough topography and tight Israeli control of water resources, there seems little prospect for a substantial increase in the foreseeable future. Consequently, rainfed farming will remain for a long time the backbone of the West Bank's agriculture and offers the largest potential for growth. Besides, this sector is the one most closely linked with the fundamental elements of resource conflict, namely, land and labour.

Vigorous growth in rainfed patterns of farming is hampered by their declining relative profitability. Although this study has demonstrated a fairly positive profitability for almost all major dryland enterprises, most of them (especially olives) suffer from important disadvantages arising largely from the ruling economic structure. This is reflected clearly in the widening gap between purchase price of production inputs and sale price of rainfed produce. Consequently, profitability is noticeably low when compared with other investment option open for labour and capital.

In fact, if farmers in dryland areas were to evaluate their enterprises on purely economic criteria, they would be much better off selling their land and leaving for Jordan and the Gulf states, where labour and capital are much more remunerative. Fortunately, this has not been the case, partly due to an intrinsic attachment to land, and partly due to the notably efficient mobilization of labour and capital inputs which have low alternative investment possibilities.

Development of rainfed agriculture

The basic objective of this study has been to show how to assist farmers in dry areas raise their profit margins and expand their production base. Chapter X laid down the objectives of a development strategy which places emphasis on extensive land and labour use rather on capital and labour intensive projects. In this connection, the researcher has proposed the concept of "national" viability as an important supplement to arguments of economic viability.

Rainfed patterns of farming vary widely in their profitability situation, and their economic returns are not always commensurate

with their national viability, as it is interpreted in terms of the continuing political and resource conflict. This means that if viewed from the Palestinian side it becomes a national obligation to help raise the profitability of certain types of farming to a level which is sufficiently high to attract or retain eligible producers. Consequently, subsidizing rainfed agriculture can be seen as a major principle in a Palestinian agricultural policy.

Within this context, Chapter XI proposed several important institutional adjustments which would help accelerate agricultural development. This involves fundamental changes in institutions dealing with planning, research extension, education, finance, marketing and cooperatives.

Chapters XII and XIII were devoted respectively to the development of rainfed trees and crops, and poultry and livestock providing specific options for policy makers and potential donors.

Monetary cost estimates

Because this research was conducted over a limited period of time within an academic context, and because monetary estimates would lose some of their real value by the time this study was completed, it was decided not to engage in detailed monetary assessments of cost estimates of proposed projects. Admittedly, this was a difficult decision to make, because it would be very useful for implementation purposes to include such estimates.

However, the researcher has conducted a provisional assessment of costs which would help give a general idea on the capital requirements of the various proposed projects (see Table XIV-1), and as most listed projects will have to continue over a time

span of more than one year, cost estimates have been given for a period of three years. Further details on cost outlays will obviously have to be ascertained in due time and possibly through the channels outlined earlier in this thesis. It should also be pointed out that the figures reported in this table include in many cases total capital outlays needed, i.e. sums to be contributed by farmers themselves. Furthermore, no estimates have been made for institutional projects which are too diffuse to quantify at this stage, (eg, 1.2, 5.1, and 5.5).

Defrayment of capital needs

According to the estimates in Table (XIV-1), the capital needs for the implementing of proposed projects amount roughly to JD 4.9 millions in the first year, and then JD 6.4 mill. and JD 8.7 mill., respectively, for the second and third years (approximately £8 m, £10.2 m, £13.9 m respectively).

No effort has been made to isolate the basic components of the needed outlays in terms of source (equity vs. loans) or credit rating (loans vs. subsidies). Clearly, there are marked variations in this regard among projects. Besides, these issues will have to be decided at the senior management level within credit and donor agencies themselves. During the researcher's inquiries with officials in the Joint Committee and voluntary agencies the researcher felt that they were strongly committed to a policy of making grants to those projects which possessed inadequate profitability, if they yielded adequate political or social returns. In general, projected capital requirements can be roughly divided into one third of equity, one third loans, and one third advanced as grants.

The volume of loans and aid grants required for development of West Bank rainfed agriculture, as outlined in this study, are estimated at JD 13.0 mill, distributed over a period of three years. This is within the financial means allocated at present for agriculture by the Joint Committee (JD 6.0 mill. per year) and voluntary agencies (JD. 1.0 mill.).

These figures were released to the researcher during the course of his repeated contacts with senior officials in the Joint Committee and in voluntary agencies. Although the allocations reported above cover irrigated forms of agriculture in the Gaza Strip and the West Bank, about 60 percent of it is earmarked for dryland farming.

In conclusion then, while this study is concerned with resources which are currently utilised in an almost unique political context, and while the proposals are inevitably a response to this context and are circumscribed by unusual constraints, they are unlikely to be subject to funding limitations. If a peaceful solution to the Israeli-Palestinian conflict is not forthcoming, it is hoped that the present study may make a small contribution to the well-being of the people of the West Bank while they are under occupation.

Table (XIV - 1)

Provisional cost estimates of proposed projects

(Thousand Jordan Dinars)

Project No.	Title of project	Time span (years) I	II	III
1.0	Administration of agricultural development			
1.1	Granting ministerial authority to the Joint Committee	-	-	-
1.2	Establishing a Central Development Board	-	-	-
1.3	Development of the Rural Research Centre	-	-	-
2.0	Extension, Research, and education			
2.1	Inservice training for extension and research staff	5	7	10
2.2	Expanding extension staff of voluntary agencies	7	8	15
2.3	Modernizing the Khadourie and A'rroub Agricultural Schools	9	12	18
2.4	Conducting a feasibility study for a college of agriculture	4	-	-
2.5	Establishing the Institute for Horticultural Research	11	12	13
3.0	Cooperatives			
3.1	Establishing the Cooperative Institute	15	12	10
3.2	Establishing the Cooperative Bank (budget allocations included under 4.1)	-	-	-
3.3	Substituting seasonal cash loans by services in kind	-	-	-
4.0	Agricultural finance			
4.1	Establishing the Palestine Agricultural Credit Corporation (PACC)	2,000	3,000	4,000
4.2	Building institutions for the processing of PACC loans	66	73	80
4.3	Auditing of financed projects	9	10	15
4.4	Expanding resources available to voluntary agencies	100	150	300
4.5	Establishing the Agricultural Development Corporation	500	700	1000

Project No.	Title of project	Time span (years) I	II	III
5.0	Marketing			
5.1	Establishing the Agricultural Marketing Bureau	-	-	-
5.2	Exercising tighter control on wholesale markets	-	-	-
5.3	Exploring the potential for selective agricultural industries-feasibility studies	5	5	4
5.4	Expanding cold storage facilities - feasibility studies	2	1	-
5.5	Importing auxiliary marketing services	-	-	-
6.0	Land reclamation			
6.1	Establishing regional land development units	270	300	350
6.2	Development of cisterns in reclamation areas	15	16	20
6.3	Development of agricultural roads	240	250	270
6.4	Distribution of tree seedlings (cost is included under 8.1 and 9.1)	-	-	-
6.5	Dissemination of mechanized services fit for hilly slopes	300	400	600
7.0	Water			
	Excluded, except to the extent necessitated by related dryfarming projects (eg 6.1, 6.2)	-	-	-
8.0	Olives			
8.1	Wider distribution of seedlings - total cost (two thirds of it should be paid by farmers)	170	220	330
8.2	Raising the production capacity of producing nurseries	30	50	40
8.3	Rejuvenation of aged olive orchards	20	18	12
8.4	Supplemental irrigation of olive trees - a technical feasibility study	2	3	5
8.5	Application of chemical fertilizers - cost of demonstrations	6	6	5
8.6	Partial substitution of tillabe by herbicides - cost of demonstrations	10	15	10
	- subsidy on commercial use	5	10	20

Project No.	Title of project	Time span (years) I	II	III
8.7	Localized treatment of diseases			
	- cost of demonstrations	2	3	4
	- subsidy on commercial use	4	7	15
8.8	Gradual introduction of picking hormones			
	- cost of demonstration	5	-	6
	- subsidy on commercial spraying	4	-	5
8.9	Selective modernization of olive presses	140	160	170
8.10	Introduction of modern oil tinning techniques	125	135	-
9.0	Grapes			
9.1	Wider distribution of seedlings	16	9	12
9.2	Expanding of trellised vineyards - total cost (half of cost should be contributed by farmers)	150	165	180
9.3	More efficient pest control	4	4	3
9.4	Processing of grape products, a feasibility study (cost is included in 5.3)	-	-	-
10.0	Almonds			
10.1	Dissemination of almonds as a forest tree	3	4	5
10.2	Introduction of improved varieties	4	6	7
10.3	More effective control of almond pests	6	6	4
10.4	Establishing another shelling mill	80	-	-
11.0	Other trees			
11.1	Wider propagation of figs, apricots and plums	10	20	40
11.2	Introducing better varieties in nurseries (cost is estimated in 8.2)	-	-	-
11.3	Collective control of scaly fig insect	3	5	5
11.4	Wider use of weedkillers through custom service units (cost is estimated in 8.6)	-	-	-

Project No.	Title of project	Time span (years) I	II	III
12.0	Field crops			
12.1	Wider custom machine servides	-	-	-
12.2	Provision of certified seeds at subsidized prices	5	7	9
13.0	Vegetable crops			
13.1	Expanding export potential (cost will be included under 5.1, when a study is conducted)	-	-	-
14.0	Poultry			
14.1	Establishing a chick hatchery	110	-	150
14.2	Provision of subsidized credit facilities	140	210	300
14.3	Improving veterinary services	20	12	15
15.0	Sheep and goats			
15.1	Improving of natural grazing pastures	15	30	50
15.2	Promoting forage production on private land	2	5	10
15.3	Reconstructing cisterns in grazing areas (cost is included in 6.2)	-	-	-
15.4	Promoting commercial fattening of lambs	100	150	250
15.5	Prolonging the lambing season by hormone injections			
	- cost of demonstrations	2	3	3
	- subsidy on commercial scale treatment	5	10	20
15.6	Promoting "Assaf" sheep raising in in-door patterns of management	65	100	200
16.0	Cows			
16.1	More efficient insemination services	8	10	12
16.2	Providing loans for upgrading of replacement stock	60	90	150
	Total	4,889	6,429	8,752

APPENDICES

Appendix 1

Research visits outside the West Bank

Britain

1. Leeds University
   - Department of Economic Studies (Dr I P Simpson)
   - Science Library
2. Durham University
   - Centre for Middle Eastern and Islamic Studies
   - Department of Economics (Dr Rodney Wilson)
   - Department of Geography (Prof Bowen Jones)
3. Oxford University
   - Centre for Middle Eastern Studies (Dr Rogers Owen)
   - Department of Agricultural Economics
4. Commonwealth Agricultural Bureau (Oxford)
   - Centre for Agricultural Economics
5. University of London - School of Oriental and African Studies
6. Overseas Development Institute - London
7. Foreign Office - Department of Economics (Dr G Hailey)
8. United Nations Association, London (Tim Coone)
9. University of Reading
   - Department of Agricultural Economics
   - Department of Geography (Prof A H Bunting)
   - Agr. Economics and Rural Development Centre (Peter Oakley)

United States

1. Centre of Middle Eastern Studies, Washington DC. (Director Dean Brown, former Ambassador to Jordan).
2. American Enterprise Institute, Washington (Prof E Nakhleh).
3. American Near East Refugees Aid, Washington (Director, Dr P Gupser).
4. Georgetown University (Prof Hisham Sharabi).
5. Department of State (Edmund Hull, Asst. to Harold Saunders)
6. Brookings Institute Library.
7. Ford Foundation Headquarters, New York (Dr Ann Lesch).
8. Columbia University (Daniel Hewitt).

Lebanon

1. American University of Beirut - School of Agriculture.
2. International Centre for Agricultural Research in the Dry Areas.
3. Economic Commission for West Asia - Rural Development Division.

Jordan

1. Ministry of Agriculture - The Minister and others.
2. Jordan Development Board - President, Dr H Oddeh.
3. Agricultural Credit Corporation - Director, Dr Sami Sonna'.
4. Jordan Cooperative Organization - Director, H Nabulsi.
5. Jordan University, School of Agriculture.
6. Royal Scientific Society - Department of Economics.
7. Arab Organization for Agr. Development - Amman Regional Office.
8. Jordan Statistics Department.

Israel

1. Volcani Institute for Agricultural Research - Centre of Olive and Grape Studies.
2. Central Bureau of Statistics - Jerusalem.
3. Hebrew University - Jerusalem.
4. Rural Settlement Centre - Rehovot.

Kuwait

1. Arab Fund for Social and Economic Development.

Appendix II

DEVELOPMENT OF RAINFED FARMING IN THE WEST BANK

A PROFITABILITY ANALYSIS*

Village and district :
Type of farming :
Number of interview:
Date :

1. Age
   a. Below 30
   b. 30 - 50
   c. 50 - 65
   d. Over 65

2. Education
   a. None
   b. Primary
   c. Secondary
   d. Teachers' training institute
   e. College
   f. Other:_____

3. Profession
   a. Full-time farmer
   b. Labourer/farmer
   c. Full-time labourer working on his farm in spare time
      place of work (W. Bank or Israel):_____
   d. Full-time employee working on his farm in spare time
      Specify main job:_____
   e. Other :

4. Type of tenure
   a. Owner operator
   b. Share cropper
   c. Absentee owner
   d. Cash rent

5. Amount of "fee" family labour (start by the respondent)

Family member (ex.wife, son...etc.)	Type of work usually done	Estimated number of work days/year	Market value
Total	XXXXXXXXXX		

6. Farm enterprises

Type	Area Irrigated	Area Rainfed	Number(of livestock & poultry)

7. Machinery and draught animals

Type of machine or animal	Number of units	Current value
Total	XXXXXXXX	

* Questions 1-7 are common to all types of farming, then a different supplement is used for each of fruit trees, field crops, and livestock.

Fruit trees' supplement

8. Orchard to be studied
   A - Land
   Type of terrain
   Is land terraced ?
   Condition of terraces
   Rockiness
   Distance from home
   Type of road
   Number of cisterns, if any:their condition
   Fitness to tractor ploughing
   Estimated ruling price(per donum)
   Total market value of the plot

8.1 Interest on land value at a rate of __ %
   B. Trees
   Kind(s)
   Number , producing
   non - producing
   Approximate age
   Pattern of planting (regular or not)
   Variety
   Rootstock

C. Cost of developing the orchard until production (except for olives and figs). Include all costs incurred until commencement of commercial production. Dont include cost of land development.

Cost item	Description	Price	Total cost
Ploughing			
Digging holes			
Seedlings			
Planting			
Trellising			
Fertilizer			
Manure			
Tillage			
Total	XXXXXXXXX	XXXXX	

Number of years until trees reached commercial production
Estimated productive life of the orchard
8.2 Amortized rearing costs per year of productive life

9. Ploughing
   Number of ploughings
   Mehthod(s) used
   If tractor, describe
   Cost per unit of ploughing(day,hour,donum)
   Number of ploughing units per year(include ploughing by owner).

Cost of ploughing _____
Cost of meals provided to ploughmen _____
Cost of tillage _____

9.1 Total cost of ploughing and till ge _____
Number of units of owner-ploughing(per year) _____
If you don't use tractors, why?

_____
_____

10 Pruning
Cost of "annual" pruning (by labour) _____
Amortaized cost of rejuvenation pruning _____

10.1 Total cost of pruning _____

11 Fertilization and manuring

Type	Quantity	Price	Total cost
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total	XXXXXX	XXXXXX	_____

12 Pest control*

Kind of pest	Chemical used	Rate	Cost per year
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total	_____	_____	_____
Cost of labour	_____	_____	_____
Total cost	_____	_____	_____

*If not annual, calculate total costs and amortize them on an annual basis.

13 Picking

Number of hired man-days	_____	_____	_____
Number of hired woman-days	_____	_____	_____
Cost of meals			_____
Cost of hauling the crop			_____
Cost of bags, boxes and/or tin cans			_____

13.1 Total cost of picking _____
For olive growers : what are the terms of sharing the crop in your area when the orchard is leased to share-farmers for picking ?

_____

14 Other expenses

Description	Estimated annual cost
_____	_____
_____	_____
_____	_____
Total	_____

15 Total Production Costs

Interest on investment in land	_____
Amortized development cost of orchard	_____
Ploughing and tillage	_____
Pruning	_____
Fertilization and manuring	_____
Pest control	_____
Picking	_____
Other expenses	_____
Total annual costs	_____

16 Returns
A. Non-olives

Forms of produce	Average for a good year			Average for a bad year			Family consumption %
	Yield	price	value	Yield	Price	Value	
_____	____	__	____	____	____	____	_____
_____	____	__	____	____	____	____	_____
_____	____	__	____	____	____	____	_____
Total	____	XXX	____	____	XXX	____	_____

B. Olives

	Average for a bad year	Average for a good year
Estimated gross output	_____	_____
Quantity used in picking	_____	_____
Quantity which goes to press-house	_____	_____
Extraction percentage	_____	_____
Gross oil output	_____	_____
Less pressing charges at ____ %	_____	_____
Quantity of oil received by owner/picker	_____	_____
Less share of tenant/picker (if any)	_____	_____
Quantity received by owner / non-picker	_____	_____

C. Miscellaneous returns from olives

Description	Average quantity	Market value
_____	_____	_____
_____	_____	_____
_____	_____	_____
Total	_____	_____

D. Disposal of olive oil

a. Family consumption _____
b. Gifts to relatives _____
c. Sales (average for good and fair years) _____

Field crops' supplement

8. Field to be studied
A. Land

Area _____
Type of terrain _____
Is land terraced? _____
Condition of terraces _____
Rockiness _____
Distance from home _____
Type of road _____
Number of cisterns, if any-their condition _____
Fitness to tractor ploughing _____
Estimated ruling price (per donum) _____
Total market value of the plot _____

8.1 Interest on land value at a rate of ____% _____

*Depreciation of machinery , cost of maintaining draught animals and machinery, and interest on investment in both of them will not be included.

B. The crop
Variety _____
Source of seeds _____
Seed treatment _____
Rate of seeding _____
Method of seeding _____

9. Production expenses (for the entire field)

Cost item	Rate of use	Price	Cost
Land rent, if applieable			
Ploughing:			
1.			
2.			
Harrowing			
Seeds			
Seeding			
Fertilizer			
Spreading of fertilizer			
Hand weeding			
Weed killers			
Pesticides			
Labour for spraying			
Manual harvesting			
Machine harvesting			
Combine harvesting			
Manual threshing			
Machine threshing			
Hauling crop to store			
" straw			
Interest on land value, if owned			
_____			
Total costs			

Livestock supplement

8. **Sheds and equipment**

Description	Initial cost	% depreciation	Annual depreciati
Sheds			
_____			
Feeders			
Waterers			
_____			
_____			
Total XXXXXXXX		XXXXXXXX	_____
Maintenance XXXXXXXX	XXXXXXXXX	XXXXXXXX	_____
Total cost of depreciation and maintenance			_____

9. Size of flock

Type of livestock*	Number**	Ruling price	Market value
_____	____	_____	_____
_____	____	_____	_____
_____	____	_____	_____
_____	____	_____	_____
_____	____	_____	_____
Total value	XXX	XXX	_____

*Excluding draught animals.

**For sheep and goats, enter number as in early autumn.

10 Interest on investment in sheds, equipment and flock

Total value of sheds and equipment	_____
Total value of flock	_____
Total investment	_____
Opportunity cost 10 %	_____

11 Variable costs (for one year)

11.1 Cost of starting flock

Description	Number	Price	Cost
_____	____	____	____
_____	____	____	____
_____	____	____	____
Total	XXXX	XXXX	____

11.2 Feed

Description	Quantity	price	Total cost
_____	____	____	_____
_____	____	____	_____
_____	____	____	_____
_____	____	____	_____
Total	XXXX	XXXX	_____

11.3 Grazing

Description	Duration	Cost
_____	_____	____
_____	_____	____
_____	_____	____
Total	XXXXXX	____

11.4 Medicines

Description	Cost
Curative	____
Vaccines	____
Feed additives	____
Treatment fees	____
Total	____

11.5 Labour

Description	Man-days	Cost
_____	_____	____
_____	_____	____
_____	_____	____
Total	_____	____

11.6 Other costs

Description	Cost
Transportation	_____
Water	_____
Fuel	_____
Mortality	_____
Marketing	_____
Total	_____

11.7 Cost outlay

Description	Cost
Maintenance and depreciation	____
Interest on investment	____
Starting flock	____
Feed	____
Grazing	____
Medicines	____
Labour	____
Other costs	____
Total cost	____

12 Returns

Description	Quantity	Price	Value
_____	_____	____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total	XXXX	XXXX	_____

13 Net returns

Total returns	_____
Less total cost	_____
Net returns	_____

14 Problems and suggestions

Problems	Suggestions
Production:	
Marketing:	
Institutional services:	

جامعة برادفورد - انكلترا

تطوير الزراعة البعلية في الضفة الغربية

مشروع بحث لشهادة الدكتوراه في التنمية الريفية

تحليل لاربحية الزراعة البعلية

(الاستبيان المنقح)

القرية : نوع الانتاج :

اللواء : رقم الاستبيان :

التاريخ : تاريخ التدقيق :

---

١. عمر المزراع :

أ - اقل من ٣٠ سنة ج - ٥١ - ٦٥

ب - ٣٠ - ٥٠ د - فوق ٦٥

٢. مستواه التعليمي :

أ - لم يدخل المدرسة د - معاهد معلمين

ب - ابتدائي (١ - ٦) هـ - دراسة جامعية

ج - ثانوي (٧ - ١٢) و - اخرى

٣. المهنة :

أ - مزارع متفرغ

ب - مزارع/ عامل زراعي

ج - بشكل رئيسي عامل ولكنه يشتغل في ارضه في نهاية الاسبوع والعطل .

مكان العمل : الضفة _____ ام اسرائيل _____

د - موظف متفرغ ويعمل في مزرعته في وقت الفراغ .

الوظيفة : _____

هـ - موظف متقاعد ويشرف على مزرعته

و - تاجر/مزارع نوع التجارة : _____

٤. تصنيف المزارع :

أ - مالك للارض ويعمل بها . ج - مزارع/مستأجر .

ب - مزارع بالحصة د - مالك للارض ومؤجر مزرعته للاخرين

٠٥ المشاريع الزراعية :

وصف المشروع	المساحة		الثروة الحيوانية
	ري	عمل	العدد

٠٦ الالات وحيوانات الجر *

نوع الالة او الحيوان	العدد	تقدير القيمة الحالية	ملاحظات
المجموع			

* لا داعي لحساب الاستهلاك والفائدة على رأس المال المستثمر وتكاليف الصيانة للالات وحيوانات الجر لان خدماتها تحتسب بالسعر الدارج سواء كانت مملوكة او مستأجرة.

٠٧ حالة ارض المزرعة التي سيتم تقييمها : (لابعاً بالنسبة للمشاريع الحيوانية)

المساحة _____
مدى استواء السطح _____
وجود الجدران الاستنادية _____
حالة الجدران الاستنادية _____
مدى خورة الارض _____
بعدها عن البيت _____
نوع الطريق _____
عدد ابار الجمع الموجودة _____
حالتها الراهنة _____
صلاحية الارض للحراثة بالتراكتور _____

٠٨ البستان :

نوع (او انواع) الاشجار _____
الصنف _____
الاصل _____
العدد - منتجة _____
- غير منتجة _____
العمر _____
نمط الزراعة (مبعثرة او بأسطر) _____
ملاحظات _____

٩. التكاليف الانشائيـــة * :

ادخل جميع التكاليف المدفوعة في تأسيس البستان من تاريخ الزراعة وحتى بدء الانتاج الفعلي . لا تدخل تكاليف حفر وتجدير الارض . لا تحسب التكاليف الانشائية لبساتين الزيتون والتين .

نوع الكلفـــة	التفاصيـــل	السعـر	الكلفـــة
حراثـــة			
حفر جـــور			
ثمن اشتـــال			
زراعة الاشتـــال			
التعريـــش			
التسميـــد			
التزبيـــل			
التقليـــم			
النكـــش			
عمليات الوقايـــة			
_____			
_____			
المجـــموع			

تاريخ زرع البستان _____

عدد السنين حتى بدء الانتاج الفعلي _____

تقدير العمر الانتاجي للبستـــان _____

معدل الكلفة التأسيسية للسنـــة الانتاجية الواحـــدة _____

* لا تحسب اجرة مقابل العمـــل "المجاني" لافراد العـائلـة ،بمن فيهم المزارع نفسه .

١٠ الحراثـــة :

عدد الحراثـــات _____

طرق الحراثـــة _____

عدد وحدات الحراثة في السنة (يوم ،ساعة ،دونم) _____

معدل الكلفة للوحدة الواحده _____

الكلفة السنوية للحراثـــة _____

اجور النكـــش _____

كلفة وجبات الاكل المقدمة للحراثين و النكاشين _____

مجموع تكاليف الحراثة والنكـــش _____

اذا كنت لا تستخدم التراكتور للحراثة ،لماذا /؟

_____

_____

١١ التقليـــم :

كلفة التقليـــم العادي _____

كلفة التقليم التجديدي(محسوبة على اساس سنوي) _____

مجموع كلفة التقليـــم _____

١٢ التسميد والتزبيل :

النـــوع	الكميـــة	السعر	الكلفـــة
المجمـــوع			

١٣ مكافحة الافـــــات

الافـــــة	العلاج المستعمل	عدد الرشات	الكلفة السنوية	ملاحظـــات
المجمـــــوع				

* اذا كانت المكافحة ليست سنوية فتحسب قيمتها الاجمالية وتعدل على اساس سنوي .

١٤ القطف :

	العدد	معدل الاجرة	مجموع القيمة
ايام العمل المستأجر للعمال			
ايام العمل المستأجر للعاملات			
تكاليف الطعـــام			
الصناديق، الاكياس ،التنـــك			
نقل الانتـــاج			
مجموع كلفة القطـف			

١٥ التكاليف الاخرى :

التفاصيـــل	القيمة السنويـــة
المجمـــوع	

١٦ التكاليف الاجماليـــة :

معدل الكلفة التأسيسية للسلة الواحدة	
الحراثة والنكـــش	
التقليـــم	
التسميد والتزبيـــل	
مكافحـــة الافـــات	
القطـــف	
التكاليف الاخـــرى	
الكلفة الكليـــة	

١٧ العـــوائد :

تقدر الاسعار على اساس السعر في موسم الانتاج تسليم المزرعة . واذا كان في السوق اكثر من نوع تمن الاشجار فيحسب انتاجها جميعا . تحسب الكميات التي تستهلكها العائلة بالسعر الدارج .

أ ـ غير الزيتـــون :

اشكال الانتـــاج	معدل المحصول لسنة جيدة			معدل الانتاج لسنة سيئة			ملاحظـــات
	الكمية	السعر	القيمـــة	الكمية	السعر	القيمة	
المجمـــوع							

ب - الزيتـــــــون :

البيـــــــــان	المعدل لشجـــــرة		
	سيئـــة	متوسطـة	جيـــدة
تقدير للانتاج الكلـــــــي			
الكمية المستعملة للرصـــع			
الكمية المنقية لاستخراج الزيـــت			
كمية الزيت المنتجـــــــة			
(احسب نسبة الزيـــت)			
ناقص اجرة العصر بنسبة ٪			
ناقص حصة المزارع الضامن (ان وجد)			
كمية الزيت الصافية لصاحب البستان			
السعر الدارج للزيت في الموســم			
قيمة كمية الزيت العائدة لصاحب البستان			
عوائد اخـــــــرى			
المجمـــــــوع الكلـــي			

د - طرق تصريف الزيـــت :

٠١ مقدار الاستهلاك العائلي _____

٠٢ هدايا للاقارب والاصدقاء _____

٠٣ المبيعـــات (ان وجدت) _____

١٨ مقدار العمل العائلي " المحاني " - ابدأ بالمزارع نفسه *

افراد العائلة (زوجة ، ابن ، اخ ـ ... الخ)	تفاصيل العمل الذي يقومون به	عدد الايام	الاجرة الدارجة	القيمة
المجمـــــوع				

* احسب فقط مقدار العمل المتعلق بالمشروع الذي يجري تقييمه في هذا الاستبيان .

١٩ الارباح او الخسائر :

البيـــــــــان	موسم جيد	موسم متوسط	موسم سيء
مجموع قيمة العوائـــــد			
ناقص التكاليف الاجماليـــــة			
العائد على الادارة والعمل العائلي			
ناقص قيمة العمل العائلـــي			
الربح الصافـــــي			
معدل قيمة الربح الصافي للدونم			

المشاكـــــــل والاقتراحات :

المشاكـــــــل	الاقتراحـــــــات
الانتـــــــاج :	
التسويـــــــق :	
الخدمات المساعدة : (الارشاد ، القراض ..)	

جامعة برادفورد - انكلترا

تطوير الزراعة البعلية في الضفة الغربيـــــة
مشروع بحث لشهادة الدكتوراه في التنمية الريفية

تحليل لاربحية الزراعة البعلية
(المواصبن الحقلية)

القريـــــة : نوع الانتاج :
اللـــــواء : رقم الاستبيان :
التاريـــــخ : تاريخ التدقيق :

١. عمر المزارع :
أ - اقل من ٣٠ سنـــة
ب - ٣٠ - ٥٠
جـ - ٥١ - ٦٥
د - فوق ٦٥

٢. مستواه التعليمي :
أ - لم يدخل المدرسة
ب - ابتدائي (١ - ٦)
جـ - ثانوي (٧ - ١٢)
د - معاهد معلمين
هـ - دراسة جامعية
و - اخـــرى

٣. المهنـــــة :
أ - مزارع متفرغ
ب - مزارع/عامل زراعي
جـ - بشكل رئيسي عامل ولكنه يشتغل في ارضه في نهاية الاسبوع والعطل .
مكان العمل : الضفة ـــــ ام اسرائيـــــل ـــــ
د - موظف متفرغ ويعمل في مزرعته في وقت الفراغ .
الوظيفـــة : ـــــ
هـ - موظف متقاعد ويشرف على مزرعته
و - تاجر / مزارع نوع التجارة : ـــــ

٤. تصنيف المزارع :
أ - مالك للارض ويعمل بها
ب - مزارع بالحصـــة
جـ - مزارع/مستأجر
د - مالك للارض ويؤجر مزرعته للاخرين

٠٥ المشاريع الزراعيـــــــة :

وصـــــف المشـــروع	العمـــــاحة		الثروة الحيوانية
	ري	بعل	العـــدد

٠٦ الالات وحيوانـــات الجـــر*

نوع الالـــة او الحيـــوان	العـــدد	تقدير القيمة الحالية	ملاحظـــات
المجمـــوع			

* لا داعي لحساب الاستهلاك والفائدة على رأس المال المستثمر وتكاليف الصيانة لـــالات وحيوانات الجـــر لان خدماتها ستحسب بالسعر الدارج : سواء كانت مملوكة اومستأجرة .

٠٧ حالة ارض المزرعة التي ستم تقييمها : (لا يعبأ بالنسبة للمشاريع الحيوانية)

المساحـــــــة _____
مدى استواء السطـــــح _____
وجود الجدران الاستنادية _____
حالة الجدران الاستنادية _____
مدى صخورة الارض _____
بعدها عـــن البيـــت _____
نوع الطريـــــق _____
عدد ابار الجمع الموجـــودة _____
حالتها الراهـــــة _____
صلاحية الارض للحراثة بالتراكتور _____

٠٨ المحصول :

الصـــــنف _____
مصدر البـــذور _____
معاملة البـــذور _____
طريقة الـــزرع _____
المعدل للدونم (كغـــم) _____
ملاحظـــات _____

٠٩ التكاليف* : (للمساحة الكاملة للحقل)

بنود الكلفـــة	تفاصيل الاستعمـــال	السعر	الكلفـــة
اجـــرة الارض	تحسب بالسعر الدارج سواء كانت مملوكة او مستأجرة .		
الحراثة الاولى			
الحراثة الثانية			
تكسير الكـــدر			
ثمن البـــذور			
نثر البـــذور			
السمـــاد			
نثر السمـــاد			
التعشيب اليدوي			
مبيدات الاعشاب			
مبيدات اخرى			
اجرة الرش			
حصاد يـــدوي			
حصاد آلـــي			
حصاد بالكومباين			
دراسة البـــة			

* لا تحسب اجرة مقابل العمل المجاني لافراد العائلة ومن فيهم الصادر بشأنه

تابع رقم (٩)

دراسة بدوية			
نقل المحصول			
نقل القش			
ثمن اكياس			
_____			
_____			
_____			
المجمـــــوع			

١٠ العوائـــــد (من المساحة الكاملة للحقل)

الصنـــــف	الكميـــة	السعر في المزرعة	القيمة التقديرية
حبـــوب			
قـــش			
_____			
_____			
_____			
المجمـــوع			

١١ مقدار العمل العائلي "المجاني" - ابدا بالمزارع نفسه*

افراد العائلة (زوجة، ابن، اخ .. الخ)	تفاصيل العمل الذي يقومون بـــه	عدد الأيام	الأجرة الدارجة	القيمـة
المجمـــوع				

* احسب فقط مقدار العمل المتعلق بالمشروع الذي يجرى تقييمه في هذا الاستبيان .

١٢ الارباح والخسائر	
مجموع العوائد	
ناقص مجموع التكاليف	
العائد على الادارة والعمل العائلي	
ناقص قيمة العمل العائلي	
الربح الصافي	

جامعة سرالدورد - انكلستر

تطوير الزراعة المحلية في القطة العربية
مشروع بحث لنيل شهادة الدكتوراه في التنمية الريفية

تحليل لإربعة الزراعة المحلية
(أسماء ٢٠ مزرعة لكل منها)

القرية :	نوع الانتاج :
المسح رقم :	رقم الاستبيان :
التاريخ :	تاريخ التدفيق :

١. عمر المزارع :
   أ - اقل من ٣٠ سنة
   ب - ٣٠ - ٥٠
   ج - ٥١ - ٦٥
   د - فوق ٦٥

٢. مستوى التعليمي :
   أ - لم يدخل المدرسة
   ب - ابتدائي (١ - ٦)
   ج - ثانوي (٧-١٢)
   د - الجامعي
   هـ - معاهد متخصص

٣. المهنة :
   أ - مزارع متفرغ
   ب - مزارع/عامل وراعي
   ج - يمكن رئيسي عامل، ولكنه يشتغل في أربعة في سنابة الاسبوع والعطل .
   مكان العمل : القرية ——— أم اسرائيل ———
   د - موظف متفرغ ويعمل في مزرعته ايضي وقت الفراغ .
   الوظيفة : ———
   هـ - موظف متفاعد ويملك ملتي مزرعته
   و - ساعي/ مزارع نوع التجارة : ———

٤. تصنيف المزارع :
   أ - مالك للأرض ويعمل بها
   ب - مزارع مالكمستأجر
   ج - مزارع/ مستأجر
   د - مالك للأرض ومؤجر مزرعته للآخرين

المشاكل والاقتراحات :

المشاكل	الاقتراحات
الانتاج :	
التسويق :	
الخدمات المساعدة (ارشاد ، اقراض ...)	

٥. المشاريع الزراعيـــــة :

وصـــف المشـــروع	المساحـــة		الثروة الحيوانية
	ري	بعـل	العـدد

٦. الالات وحيوانات الجـــر* :

نوع الالة او الحيوان	العـــدد	تقدير القيمة الحالية	ملاحظـــات
المجمـــوع			

* لا داعي لحساب الاستهلاك والفائدة على راس المال المستثمر وتكاليف الصيانة للالات وحيوانات الجر لان خدماتها تحسب بالسعر الدارج ، سواء كانت مملوكة او مستـــاجرة .

٧. حالة ارض المزروعة التي سيتم تقييمها : (لا يعبأ بالنسبة للمشاريع الحيوانية)

المســـــــاحة _____
مـــدى استواء السطـــح _____
وجـــود الجدران الاستنادية _____
حالـــة الجـــدران الاستنادية _____
مـــدى صخـــورة الارض _____
بعـــدها عن البيـــت _____
نـــوع الطـــريق _____
عـــدد ابار الجمـــع الموجودة _____
حالتهـــا الراهنـــة _____
ملاحيـــة الارض للحراثة بالتراكتور _____

٨. الحظائـــر والادوات :

	الوصـــف	الكلفـــة الابتدائية	نسبـــة الاستهلاك	قيمة الاستهلاك السنـــوي
الحظائـــر				
_____				
المعالـــف				
المشـــارب				
الات الحلب				
_____				
_____				
المجمـــوع				

تكاليف الصيانة للحظائر والادوات _____

الكلفـــة الكليـــة

٩. حجم القطيـــــع :

النـــــوع	العـــــدد	السعر الدارج	القيمـــــة
الابقـــــار*:			
حلوبة (بلـــدي)			
حلوبة و (هولندي)			
عجـــــلات			
عجـــــول			
ثيـــران			
الاغنـــام*			
نعـــاج			
ماعـــز			
حمـــلان			
جديـــان			
اكبـــاش			
الدواجـــن :			
ببـــاش			
فـــراخ			
لاحـــم			
المجمـــوع			

* يحسب حجم القطيـــع بالنسبة للابقار والاغنام كما هو عادة في الخريف .

١٠ الفائدة على رأس المال المستثمر في الحظائر والادوات والقطيع :

رأس المـــال المستثمر في الحظائر والادوات _____

رأس المـــال المستثمر في القطيـــع _____

السعر الدارج للفائدة على الاستثمار الزراعي _____

قيمة الفرصة المضاعة لرأس المال المستثمـــر _____

١١ العـــــلف* : (التكاليف لعام واحـــد)

البيـــــان	الكميـــة	السعـــر	مجموع الكلفة	ملاحظـــات
شعيـــر				
ذرة				
كرسنـــة				
نخالـــة				
خلطة جاهزة				
حليب مجفف				
بالات قـــش				
تبـــن				
_____				
_____				
المجمـــوع				

* لا تحسب تكاليف العلف او اية تكاليف اخرى للفراخ الباضة لغاية عمر اربعة اشهر. اما بالنسبة لصيصان اللحم فتحسب جميع التكاليف المتغيرة على اساس الحجم الكلي للقطيـــع الذي يتم ترتيبه خلال العام .

١٢ الرعـــــــي :

الموقـــــع	المـــدة	نوع المرعى	الكلفة*
_____			
_____			
المجمـــوع			

* لا تحسب هنا كلفة نقل القطيـــــع .

١٣ النقـــــــــل:/

البيـــــــــان	الكلفة التقديريـــــة
المجمـــــوع	

١٤ العمـــــــال*:

البيـــــــان	العـــــدد	الكلفـــة السنويـة
دائمين		
عمـــل موسمـــي		
المجمـــــوع		

* لا تحســـب اجرة مقابل العمل " المجاني" لافراد العائلةالمقيمين فيهم المزارع نفسه .

١٥ الوقاية والمعالجـــة : (تحسب علي اساس المعدل السنوي)

البيـــــان	الكلفة السنويـــة
المجمـــــوع	

١٦ قطعـــــان التحديد :

البيـــــان	العدد	السعر*	الكلفـــه
المجمـــــوع			

* تحسب الفراخ البياض بسعر شرائها على عمر اربعة اشهر سواء اشتراها المزارع على هذا العمراو على عمر يوم واحد وقام بتربيتها في مزرعته . اما صيصان اللحم فتحسب بسعر الشراء على عمر يوم واحد ويدخل هنا مجموع العدد الذي يتم خلال العام .

١٧ التســـــويق :

البيـــــان	السعـــر	الكلفة السنويـــة
رسوم بلديـــــة		
المجمـــــوع		

١٨ التكاليـــــف الاخرى :

نوع الكلفة	البيـــــان	الكلفـــــة
ميـــاه		
محروقـات		
الوفيات		

٢٠ العـــوائد : (بحسب الاستهلاك العائلي بسعر السوق)

نوع الانتاج	الكمية	معدل سعر المزرعة	القيمة	نسبة استهلاك العائلة	ملاحظات
حليب طازج					
لبن رايب					
حمـيـد					
زبـــدة					
سمـــنة					
جبنـــة					
لبن مخيض					
صـــوف					
شعـــر					
زبـــل					
شيـــاه					
حملان وجديان					
بيـــض					
لحم دجاج					
المجمـــوع					

٢١ مقدار العمل العائلي "الحصاني" - ابدأ بالمزارع نفسه

افراد العائلة (زوجة، ابن، اخ ....الخ .	تفاصيل العمل الذي يقومون بـــه	عدد الايام	الاجرة الدارجة	القيمة
المجموع				

* احسب فقط مقدار العمل المتعلق بالمشروع الذي يجري تقييمه في هذا الاستبيان.

تلقيح صناعي

المجمـــوع		

١٩ ملخص للتكاليـــف :

البيـــــان	القيمـــة
الحظائر والادوات (الاستهلاك والصيانة)	
الفرصة الضائعة لرأس المال المستثمر	
العلـــف	
الرعـــي	
النقـــل	
العمـــال	
الوقاية والمعالجة	
قطعان التجديد	
التسويـــق	
التكاليف الاخرى	
مجموع التكاليف السنويـــة	

٢٢ الاباح والخسائر :

مجموع العـــــوائد _____

ناقص مجموع التكاليف _____

العائد على الادارة والعمل العائلي _____

ناقص قيمة العمل العائلي _____

الربح الصافـــــي _____

المشاكل والاقتراحـــــات :

المشـــــــــــــــــاكل	الاقتـــــــــــــــــراحات
الانتـــــــــــاج	
التسويـــــــــــق	
الخدمات المساعدة (ارشاد، اقراض ...)	

Appendix III

AGRICULTURAL POLICIES

1. Statistical outlook:

1.1 Areas under cultivation and yield

1.2 Irrigated and rainfed land (area of each)

1.3 Closed areas

1.4 Water resources

1.5 Number of Israeli wells

1.6 Areas under drip irrigation and plastic cover

1.7 Machinery and major equipment

2. Land problems

2.1 Problems of fragmentation and erosion

2.2 Measures to alleviate consequences of fragmentation

2.3 Measures to minimize erosion

2.4 Opinions on Land Reclamation Project

2.4.1 - types of improvements needed

2.4.2 - suggested methods of reaching farmers

2.4.3 - cost estimates

2.4.4 - subsidy arrangements

3. Labour

3.1 Extent of labour shortage - is the problem actual shortage, or
- wages too high for agriculture?

3.2 Examples on impact of labour problems

3.3 Estimate of unpaid family labour (% of total in agriculture)

3.4 Estimate of women labour (% of total in agriculture)

3.5 Means of mobilizing labour with low opportunity cost

4. Machinery

4.1 Reservations on the use of labour saving machinery

4.2 Machine services needed

4.3 Type and number of machines needed

4.4 Means of reaching farmers

5. Cooperatives

5.1 Present scope of activities (in agriculture)

5.2 Prospects of expansion

6. Marketing

6.1 Problems faced in marketing major products produced in the district

6.2 The need for agricultural industries

6.3 Recommendations regarding the establishment of modern oil pressing plants or cold storage facilities.

7. Finance

7.1 Shortage of credit facilities

7.2 A projection of needs: objectives and estimates

7.3 Means of reaching farmers

8. Structural changes in patterns of farming

8.1 Background information

8.2 Proposed structural changes

FRUIT TREES

1. Ploughing

1.1 Number, dates, objectives, methods

1.2 Extent of tractor, ploughing, limitations, prospects of wider use

1.3 Means of reducing ploughing expenses

2. Weed killers

2.1 Kinds used, extent of use, response of farmers

2.2 Means of disseminating wider use

3. Fertilization use (specify kinds of trees)

3.1 Kinds, quantities, extent of use, response of farmers

3.2 Recommended policies

4. Pruning

4.1 Frequency, effectiveness

4.2 Recommendations

5. Pests

5.1 Names of common pests, extent of damage, methods of control

5.2 Recommendations

6. Picking

6.1 Percentage of unpaid family labour

6.2 Percentage of women labour

6.3 Methods of reducing cost (e.g. prospects of hormone use on olives)

6.4 Means of mobilizing school children in harvest seasons

7. Pressing (of olives)

7.1 Kind of machines

7.2 Problems

7.3 Recommendations regarding "modern" olive presses

8. Marketing

8.1 Present channels

8.2 Problems and recommendations

9. Structural changes

9.1 What should be expanded, where, and how?

9.2 More grapes in the north and less olives?

9.3 More olives in the south?

9.4 New trees to be introduced

9.5 Prospects of intensification through inter-copping

FIELD CROPS

1. Preparation of seedbed

1.1 Ploughing: number, methods, cost

1.2 Harrowing: methods, cost

1.3 Problems and recommendations

2. Seeding

2.1 Source of seeds, varieties used, rate of seeding, treatment against diseases, cost

2.2 Method of seeding, cost, usual dates

2.3 Problems and recommendations

3. Fertilizer use

3.1 Kinds, quantities, cost

3.2 Method of spreading, dates and cost of spreading

3.3 Problems and recommendations

4. Diseases and insects

4.1 Names of common pests, extent of damage

4.2 Methods of control, extent of use, effectiveness

4.3 Problems and recommendations

5. Weeding

5.1 Methods, dates

5.2 Extent of herbicide use, response of farmers

5.3 Recommendations for more effective use of herbicides

6. Harvesting

6.1 Methods, dates, problems

6.2 Recommendations regarding wider use of machines

7. Marketing

7.1 Existing channels

7.2 Problems and recommendations

8. Fallowing

8.1 Extent of spread, reasons

8.2 Possibility of substituting fallow by Medicago legumes

9. Structural changes

9.1 New crops to be introduced, crops to be curtailed

9.2 Institutional recommendations

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ACKNOWLEDGEMENTS

The researcher is indebted to very many people for their contribution in various ways for the purpose of this study. Foremost, he is both appreciative and proud of the whole-hearted cooperation he received from farmers and residents in rural communities who, especially in the present West Bank setting, are normally reserved with outsiders. The researcher is also grateful for the unlimited cooperation he received from the great number of officials employed in relevant government offices, despite the risk they encountered in violating military orders. Regrettably, no names can be mentioned here.

The researcher owes much to Dr Paul Rogers, his supervisor. Despite his numerous obligations inside and outside the School of Peace Studies, Dr Rogers has extended generous support and guidance throughout all the stages of this research. His help in constructing the questionnaires used and his very careful revision of the various drafts of this thesis were instrumental in seeing this work to completion.

The researcher is also grateful to Mr Andrew Coulson, his second supervisor. Drawing on his widespread knowledge of problems of agricultural development, Mr Coulson provided valuable help in various forms, especially on technical questions relating to methodology, review of literature, and interpretation of data.

Last, but certainly not least, the researcher owes much to his wife and children. Through their hopeful patience he was able to devote to this study most of the time which should have been theirs. I hope that their sacrifice will be adequately rewarded.

Hisham Awartani

ADDITIONS AND CORRECTIONS