

Towards Alternative Self-Reliant Agricultural Development

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Preface

It is a pleasure to introduce this invaluable work that debates an important issue pertaining to the agricultural sector. For historical, economic and cultural reasons, the Palestinian people have depended on the land for their wellbeing. Though the agricultural sector faces many obstacles that have greatly staggered its development, concern for the sector has diminished, particularly with the ending of the Intifada. Israeli policies meanwhile have focused on destroying the agricultural capacity of Palestine and imposing it to sub serve the Israeli economy. At the same time, assistance programs do not give adequate attention to the sector, indicated by the marginal apportionment of international assistance to agriculture, funds that are far sufficient from bringing about necessary change.

The paper presents various presentations towards an alternative development model in agriculture that relies on participation, simplicity, self-reliance and environmental awareness. This involves proposals in policy-making that must be considered in strategizing for Palestinian agriculture. While the analytical approach used is concise and in depth, it does not strive to present a comprehensive strategy in agricultural development; in fact, there are question marks as to whether this strategy can be applied realistically. There is no doubt however that several local and external factors must

apply in order to make the presentations realistically possible. This involves admitting to the continuous overpowering status of the capitalist market as the basis for the attitudes of producers and consumers and the use of available resources. Additionally, comprehensive research must be made on whether any of the proposed strategies can be applied. Here also comes in the importance of having confidence in the ideas presented and the importance of convincing the farmers of these ideas, given that all other circumstances favor the success of these proposals. There is no doubt that this study serves to disclose and analyze the current status of agriculture in Palestine, towards formulating an appropriate agricultural strategy, alongside formal proposals.

We hope this study receives the consideration it deserves from policy-makers, and researchers and that it contributes to the formulation of a developmental framework for Palestine, one that considers the human aspects involved. This paper was made possible through the joint partnership of two Palestinian institutions working in development: MA'AN Development Center (MA'AN) and the Development Studies Program at Birzeit University.

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Abstract

This research paper seeks to propose informal popular agricultural production as an alternative to the formal Arab agricultural economic plans and policies, in general, and as an alternative to the formal Palestinian and international plans and policies that are set for the West Bank and Gaza Strip, in particular. It includes an analytical approach to some of the most significant objective and external factors that have resulted in the distortion of the agricultural economy in Palestine. Aside from a critical analysis of the current proposals, policies, and strategies (that are based largely on the fact that the Palestinian economy is subservient to the Israeli economy), this paper also takes up the self-imposed factors that serve to deepen the distortion of the agricultural economy.

Furthermore, this paper seeks to gain support for national agricultural production through applying an agricultural strategy based on internal articulation within the local market. This entails free and unrestrained self-reliant popular production and public production projects that are inter complementary in the sector, as well as the initiation of informal agricultural activities. This means encouraging interrelated agricultural patterns that take incorporate traditional and natural organic practices that are sector articulated and which use little external inputs. All this should finally break our dependence on external inputs and guarantee diversified production and food security. This also entails that our agricultural strategy should be linked directly with industrial production.

This paper regards that the most beneficial agricultural production system is the self-reliant one. All its various components are supplied from within the system itself. In this system, overspending does not exist, there are no lost wastes that are not returned to the system, and there are no destructive hazards caused to the environment, the soil and general health.

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Introduction

Western government representatives and international economic and financial institutions are strongly and systematically pushing forth the concept of "Free Trade", "globalizing" world economies and improving foreign investment potential in developing nations. In short, the West still insists on forging development onto the people of the "Third World," a development based on economic and social concepts that have nothing to do with these states' productive, economic, and social structure. The concept of "Free Trade" is a direct outcome of the economic, technological and administrative standing of the developed industrial West and its role in the international market. The status of the industrialized states is totally discordant with the status of "Third World" states. The latter have drastically failed in applying Western models and succeeded only in destroying the traditional economic foundation that existed before their colonization. Their economies, including their agriculture, were dependent on the local resources and markets. Western colonialism destroyed most of the "Third World" states' economic self-reliance to substantiate their subservient consumptive character and to shed them of their food security.

Despite assurances from the Food and Agriculture Organization that 1996 registered a 7% rise in the global production of strategic grains, the global supply of grains actually decreased as prices increased by 50% for the same year.¹ This only shows that the periodical global wheat crisis is unreal and caused by the competition in the world wheat market between the United States (the world's largest wheat supplier) and Europe. Profit-based, this competition means control over the global wheat supply and thus control over the food sources of the "Third World."

Currently, wheat producers in the West (North America and the European Union) have indicated the need to increase the wheat-producing land area in their countries, while their international financial institutions are forcing "Third World" states to grow luxury agricultural products for export to Europe, America, and Japan. Meanwhile, most peoples in the "Third World" lack basic food staples. This economic precept that is imposed onto the "Third World" by the West means that monoculture, which is directed towards the so-called global market, has made these peoples unable to produce or ensure basic foods for themselves. All these people can do is face inevitable famine.

The truth of the matter is not that the world food production is insufficient but that the starved and poor of the "Third World" do not own the capital necessary to purchase or grow their own food needs. Quantity is not the issue.

Moreover, the large surplus created by the "green revolution" in production was a result of the inception of expensive inputs, such as high productivity seeds, fertilizers, chemical pesticides, and irrigation. The benefits though are reaped by the wealthy

farmers who are able to purchase large quantities of inputs and acquire credits to expand.

It's worth noting that most of the chemical pesticides used in the "Third World" (more than 70%) were used in growing luxury products for the American, European, and Japanese markets; they were not used to grow basic, primary food staples for the poor.²

In the Arab countries, many regimes have bought "prescriptions" such as "structural adjustment," "privatization," "free market," and the "Middle Eastern Project," advanced by the World Bank and the International Monetary Fund, as the way to economic prosperity. These concepts however have resulted in nothing but the regression of the public sector and state planning, exasperating the continuous diminishment of the ability of most of these Arab states to provide food for their own people with their own local resources. Consequently, these states have become even more dependent on imported food. For example, self-reliant food production has decreased in Egypt and Algeria from 84% and 88% respectively in 1963 to 62% and 41% in 1995,³ despite the fact that agriculture in many Arab states can absorb more than 50% of the local work force and in some cases up to 70%.⁴ But the contribution of agriculture to the Arab gross domestic product does not exceed 20% at best. Besides, there are enormous land areas (910 million dunums) suitable for agriculture but are not being used. These areas constitute more than 68% of the arable land in the Arab World, which is approximately 1,330 million dunums. This means that the area of cultivated land is approximately 420 million dunums, less than 32% of the total arable land area.⁵ Although most Arab regions remained self-reliant until the early 70s and some even exported grain and wheat in the 50s and 60s (as did Egypt and Sudan), they have become one of the largest importers of food products in the "Third World." In 1989, the Arab countries plummeted into a food shortage approximated at more than \$16.6 billion.⁶ The direct cause of this crisis was that the demand for agricultural products exceeded the annual growth in agricultural production (by a difference of nearly 3.5% annually).⁷ On the other hand, millions of workers in Arab countries today are jobless or are emigrating, while their own countries (and particularly the Gulf States) are filled with foreign laborers, "experts," and technicians.

Additionally, conducive to privatization, some regimes have passed new legislation to legitimize the process by which the poor become poorer and the rich richer. Recently in Egypt, the government annulled the article in the "law of lessee and lessor" that protects the tenant farmer from the stranglehold of the landowners and money giants. The previous law, set by Abdel Nasser, prevented the landowner from raising the rent or evicting the farmers.⁸ As a result of the new law, the landowners have regained the freedom to manipulate the millions of poor farmers who have since lost their sole source of income.

It's possible to overlook this dark scene and to instead focus on agricultural production as a way to satisfying the basic food requirements of the Arab people through complementary agriculture. This type of agriculture would make use of the moderate climatic conditions in many of the Arab states and would take advantage of the large

arable land areas and water resources.

In the case of Palestine, the newly achieved Israeli-Palestinian political-economic agreements impose harsher conditions and economic obstacles onto the West Bank and the Gaza Strip than those existing before Oslo, particularly that the peace process was founded on the fact that the Palestinian economy is dependent on the Israeli one. Furthermore, the international and Palestinian economic plans for the areas of Palestinian self-government were based on the false assumption that the political agreements would translate into free movement of the labor force and products between Israel and the Palestinian areas, and abroad. The only party actually enjoying free movement is Israel.

In addition, the Paris economic agreement gave Israel, similar to all the other agreements preceding it, the right to decide for the Palestinians what goes and what doesn't go. According to the agreements, Israel has sole authority over all that deals with the Palestinian exports and imports and any economic agreements with Arab or foreign states. Not only are the political security issues subject to joint Israeli-Palestinian committees but so are economic issues. Naturally, the more dominant party in these committees is the actual decision-maker. In other words, the Israeli-Palestinian agreements granted Israel sole decisive power over what items and quantities the Palestinians would be allowed to import or export. This condition also applies to agricultural trade. To cite an example, the "agricultural calendar" that was agreed upon between the Palestinian and the Jordanian Ministers of Agriculture on October 9, 1997 is actually subject to Israeli approval.⁹

This is not all. The agreements signed with Israel define which sectors, consumer items and services should take precedence over others. This is founded on the "complementary" status of the Palestinian market with the Israeli market in the various sectors, particularly those sectors that ensure the marketing of Israeli items and inputs, not to mention the use of the roads that connect the areas of the self-government with the Israeli settlements.

Agricultural land is the scarcest and most precious national Palestinian resource, which this generation should be obligated to preserve and develop for the well-being of the generations to come. However, the unfortunate irony is that in the Palestinian Occupied Territories of 1967, which have nothing but a weak consuming economy, there is a growing services sector that in 1994 registered more than 60% of the gross domestic product as the share for agriculture decreased from 35% (prior to 1967) to less than 16% (1994).¹⁰ With this decline, the ability of the agricultural sector to absorb workers decreased from 32% in the early 80s to less than 13% by the mid-90s.¹¹ In contrast, settlers in general and those settling the Jordan Valley in particular, have not ceased to expand within the Palestinian agricultural areas, while cultivated Palestinian areas are continually diminishing, lost not only to annexations and Jewdaization but also as a result of policies and activities that are non-implicative towards the land and food production.

In light of Israeli control over our food and the movement of our labor workers and our products, and its enforcement of hunger strangulation mechanisms, what is now needed is the free movement and undertaking of popular (community) self-reliant agricultural production that produces the basic food staples for the people, based on the local resources, instead of complying to the needs of the external markets and a minority of people who are in for the profit.

This course is a mechanism of national resistance favoring the Palestinian economy, as it withstands the economic and political pressures imposed by Israel and other foreign parties. This entails investment in popular agricultural production, whether through communal, collective or individual projects.

The question that must be answered is why do international financial institutions and the European Economic Community, and Israel encourage Palestinian farmers to take up agricultural practices that have failed in their own countries, such as the case with monoculture. Why are their failures exported to us? Today, the West (Europe and North America) is calling for diversified, sustainable and environmentally safe agriculture as a necessity to survival and economic stability. This new supposition will form an alternative to monoculture, which is highly dependent on inputs that come from outside the production units, e.g. pesticides, chemical fertilizers, hybrid seeds, water, monetary loans, and others. Furthermore, monoculture presents other issues that must be faced, such as environmental pollution caused by industrial monoculture, the imbalance in the natural environment, the destruction of soil fertility, and water loss. However, Palestinian rural communities have always been characterized traditionally and historically with diversified agriculture and self-reliant food production. So why are we so eager to adopt foreign agricultural systems and patterns that are short-sighted and only aim to achieve quick and easy profits at the expense of our actual food needs, our environment, water, soil, and the well-being of our future generation? Most of the profits only go to the importers and marketers in external markets.

2 Distortion of the Infrastructure of Palestinian Agricultural Production Due to Objective and External Factors

We can say that the most alarming aspect in the Palestinian economy is characterized by the continuous process to establish a consumptive and parasitic foundation for this economy. This is embodied in the fact that Palestinian society produces far less than it consumes, and there are no indications that the large gap between production and consumption will shrink. This gap, with the trade deficit, is covered to a large extent by the financial transfers coming from abroad and not by the accumulation of capital inside the West Bank and Gaza Strip. This is clearly illustrated by the low Palestinian gross domestic product in comparison with the gross national product. This becomes further apparent if we take a quick look at the food goods, whether fresh or processed, in our local market. It is startlingly clear how few Palestinian produced goods (those produced

with local materials) are compared to the total number of food goods. In fact, various types of so called "local" goods are in fact Israeli-made but marketed in the West Bank and Gaza Strip under a Palestinian label.

Being a consumer market that purchases most of its food products from Israel or abroad, including strategic foods, means explicitly that we lack food security. Here lies the true reason why we are dependent on the outside. The lack of food security means also a lack in national security, which cannot be achieved when Israel and other external markets have control over whether we eat or starve.

2.1 Destroying the Foundation of Self-Reliance

At the core, Israeli economic policy conforms with the same colonial policies set by the British occupation and the Balfour Declaration with regards to the Palestinians of the West Bank and the Gaza Strip, compared to the Palestinians of the occupied areas of 1948. These economic policies contend to destroy Palestinian agriculture. If land is not cultivated, it will be easier for its owners to abandon it, sell it or give it up. Work in the Israeli market has forced our younger generation to leave the land unused, especially the rocky areas and those that cannot be reached by tractor. Consequently, the land has become unproductive as the youth have opted for the quick buck thrown their way by Israel. This reality embodies the colonial policy of "enticing the people in order to keep the land unused."

In the Arab countries, as in the West Bank and Gaza Strip, the West continues to push forth the so-called "free market" and "free trade" through their various "development" and "funding" institutions. Not innocently, these measures have directly contributed to marginalizing or even to totally destroying the traditional economic foundation (especially in agriculture) that existed in Palestine before colonialism and which was dependent on the local market and resources. This deterioration occurred not because our economic foundation was so "backward" but because of the will of the West to advance the Zionist policy of destroying our economic self-reliance and securing our subordination. Exasperating this is the Zionist theft of large areas of the most fertile Palestinian land. Thousands of Palestinians have lost their most important production source, constituting a major blow to a source of capital accumulation that would have gone into investing in agricultural development and other sectors. If we consider the dual dismemberment of the West Bank and Gaza Strip, i.e. dismembering the land by cutting off the Gaza Strip and Jerusalem from the West Bank and cutting off human communities, we find that the Palestinian people presently lack the natural foundation necessary for the existence and development of any natural human society.

2.2 Expanding luxury Agriculture: For Whose Benefit?

The World Trade Organization's International Trade Center is trying to convince us (those living in the Palestinian Occupied Territories of 1967) that we are only "footsteps" away from entering the European market (which represents 65-70% of world

trade in flowers- the world trade being about \$10 billion). According to the World Trade Organization, an excess of \$14 billion¹² can be made by the Palestinian areas in the trade of flowers internationally. In other words, the Palestinians can produce and export a quantity of flowers that exceeds in value that of international trade! The Organization is requesting that the Palestinian Ministry of Agriculture increase the land areas grown with flowers from 900 dunums (presently) to approximately 125,000 dunums "as fast as possible because the present production rate is insignificant."¹³

Aside from all the question marks on the true reasons behind this enthusiasm to raise the production of flowers so drastically and of who are the real beneficiaries of this scheme, it is worth stating that the total cultivated land areas in the West Bank and Gaza Strip are approximately 1,782,000 dunums. Irrigated areas make up approximately 217,000 dunums.¹⁴ In other words, the areas that the World Trade Organization requests that we grow with flowers would make up approximately 7% of the total cultivated land and 58% of the total irrigated land. Considering the fact that flower production requires extensive irrigation, all of a sudden and not surprisingly, pure water (which we have long suffered a shortage of, especially in the Gaza Strip) is available for this!

In addition, the World Trade Organization encourages the Palestinian Authorities and the "donor" states to provide full support to the Palestinian farmer who exports flowers and to make sure he is not set back by Israeli measures or any natural hazards.¹⁵ The basic question here is: Why all this concern by the West and by the Israelis to facilitate the production and export of flowers, considering all other Palestinian agricultural products? Why should so many accommodations be made for a luxury product and not for a basic strategic crop such as wheat? Furthermore, why isn't support being given towards alleviating the huge losses suffered annually by our farmers as a result of the Israeli border closures and natural factors?

In fact the Israeli military government in particular has since the late 80s encouraged our farmers in the Gaza Strip to grow flowers, in an effort to steer Palestinian agriculture into producing products that correlate with the requirements of the Israeli economy, whether for direct consumption or to fill the gaps in Israeli exports. Eventually, this will serve the Israeli policy of integrating the Palestinian economy with that of Israel's. This policy, based on a series of military orders and tax measures, is aimed at keeping the Palestinian farmer from competing with the Israeli farmer both within the Israeli and Palestinian markets or in the international market.

To entice Palestinian farmers, the "civil administration meanwhile "provided" loans and technical assistance," as well as assurance of a market for Palestinian flowers. It was a success. The occupation did convince some farmers to grow flowers instead of vital food crops.¹⁶ Finally, when the Israelis had made sure that Palestinian agriculture was serving its economy, the "incentives" to the farmers were cut back. Agricultural production became subject to market fluctuations. In short, the Occupier succeeded in wiping out basic Palestinian agricultural production by denying it protection against Israeli and foreign competition and encouraging Palestinian farmers to grow luxury products that do not serve the local market but the pockets of a few landowners and

large businessmen.

In this regard, it must be made clear that the European market will not be freely accessible to the market of flowers or any other Palestinian products. The European Community enforces the PAC policy that imposes restrictions on imports from non-European states in order to protect the European farmers.¹⁷ Given that in specific political-economic circumstances facing the Palestinians, the European market could very well be closed to Palestinian products. Another consideration is the prices placed by the Western states on their own agricultural and industrial products and the ability of these products to compete with similar products in the underdeveloped countries. The "free trade" agreement signed in February 1997 between the European Union and the Palestinian Authority (separate from agreements with Israel) illustrates the shrewdness of European policy. Though tariff restrictions and other restraints were exempted for Palestinian-made goods entering the European market, tariff exemptions only applied to a marginal portion of agricultural products,¹⁸ as some Palestinian agricultural products may compete with their European counterparts.

More importantly, the Israeli Ministry of Agriculture has recently invested more than \$300 million to cultivate an area of 100,000 dunums in the Negev Desert (south of the Gaza Strip) with large quantities of citrus trees, vegetables, olive trees, wheat and flowers. These crops will be irrigated with treated waste water from the Tel-Aviv area and will yield products that are expected to compete in the European and American markets.¹⁹ This reminds us of the time the Israelis flooded the Palestinian market with Israeli watermelons, wiping out Palestinian watermelons from the market with their much more competitive prices. In 1985, Palestinian production of watermelon reached over 100,000 tons (Jenin contributed nearly 60,000 tons). But by the end of the 80s, production fell to nearly 10,000 tons (with production dropping to nil in the Jordan Valley), despite the fact that the nature of the land and the water supply for watermelon cultivation has been unchanged.²⁰

The inducement of Palestinian farmers to give up basic, traditional farming in favor of luxury agriculture, will eventually lead to the destruction of the remainder of our agricultural sector. All the while, Israel is exporting the same agricultural products we are to give up. Furthermore, Israel and Western governments that are today urging our farmers and local decision-makers to grow flowers will themselves wipe out this process altogether because the priority will be given to flowers grown in the Negev. In summary, our economy will further be distorted and our farmers will fall to poverty and starvation.

2.3 Agricultural and Development Banks

Some international parties have lately cooperated with local banks in the West Bank and Gaza Strip to provide short- and medium-term loans for workers in "irrigated agriculture in greenhouses and open fields," and to owners of agricultural projects "who wish to introduce new products such as seedless grapes, flowers, strawberries..."²¹ These

monoculture products are capital intensive and are intended basically for external markets. The provision of loans here is meant to increase capital in agriculture by setting up a debt "trap." The result is a continuous increase in the external inputs from abroad and more loans to grow the monoculture products. Eventually farmers will be drowning in debt and our subordination to the external markets and their cruel laws would be further engraved in Palestinian economics. Further, borrowers of loans are requested to mortgage their property as security on their loans.

The external markets (the West and Israel), for which luxury and monoculture products are grown (from loans) have total control over the prices, which are mostly very low. In the case that these countries stop importing these products for political or economic reasons, the results would entail a serious blow to the farmers who have adapted themselves to these markets. While the market for their goods disappears, the high production expenses remain.

Several farmers in the Jordan Valley and the Gaza Strip fell into debt and were caught by high interest rates. Unable to pay off their loans, some of these farmers received extensions on their debt payments or had their payments rescheduled, while others were unable to pay and their cases finally reached the courts²².

The loans then, which are meager to start with, are designed to establish "specialization" in monoculture on the basis of "free competition" - a system that does not forsake the weak. What should be established is one or more credit institutions that encourage agricultural development by providing affordable loans aimed at encouraging diversified self-reliant agriculture that is independent of external inputs. As a result, the farmers will be encouraged to remain on the land.

2.4 Stolen Palestinian Water

Israel confiscates the water resources of the Occupied Territories of 1967. It restricts and totally controls the administration of water in these areas, denying the Palestinians the right to use or administer this resource. Israel's robbing of the water includes underground and surface water. Artesian wells and natural springs in the West Bank have been dried up as the water was directed to the West Bank and Gaza Strip settlements and Israelis within the "greenline." As we are denied our natural water, so are we denied Palestinian agriculture, as the Palestinian territories indirectly head for desertification. The Palestinians suffer a serious shortage in drinking water and are threatened with serious health and environmental risks. While Israelis rob large quantities of underground water, the proportion of underground water allotted to the Palestinians is less than 20%, while much of the water used in settlements are for purposes of entertainment and luxury (to water decorative gardens, swimming pools, grass fields, etc.) The average daily water consumption per capita in the West Bank and Gaza Strip (including Jerusalem) is approximately 40 liters. In contrast, the Israeli settlers of the West Bank and Gaza Strip have a daily water consumption that is tenfold more.²³ The Israelis furthermore enjoy water that is subsidized by the government.

Whereas the Palestinian farmer pays \$0.07 per cubic meter, the Israeli pays \$0.014 per cubic meter.²⁴ It is approximated that Israel robs nearly 70% of the total annual water resources of the West Bank and Gaza Strip for the benefit of its settlements. Of the remaining 30%, nearly 18% of it has a high salinity content or is too difficult or too expensive to extract. Consequently, no more than 12% of the total water resources are available for the use of the Palestinians.²⁵

The exaggerated pumping of our water resources, especially in the Gaza Strip, has led to a drastic decline in the surface water to levels below natural feeding. As a result, polluted salty water has entered into the scarce underground water reserves. The quality of the water has thus diminished and in fact has become unsuitable for home or agricultural use. In the Jordan Valley, the level of groundwater has been reduced since 1969 by an average of more than 16 meters, leading to the drying out of tens of wells.²⁶ During 1982-1991, the total chlorine concentration rose by nearly 50%, reaching 1,700 mg/l.²⁷

Palestinian water is considered by Israel a basic element of its "strategic security." Israel could "agree" to increase the "Palestinian share of the water" but "not at the expense of one drop of water under Israel's control," as Shimon Peres made clear.²⁸ All succeeding Israeli governments have maintained a clear and unwaivering strategy that Israel can take as much of the Palestinian natural resources as possible, in order to leave the Palestinians with nothing but scraps.

Some Western states and their international institutions have spared no effort in convincing and pressing the Palestinians towards this end. For instance, the World Bank Report on Water in the Middle East (1996) "advised" the Palestinians to give up agriculture, which "requires much water which is scarce," and to turn towards an "advanced technological economy." In return, the Jewish settlements can enjoy an unlimited supply of high quality fresh water, while the Palestinians are denied the water resources that are in truth highly abundant, particularly in the West Bank.

In addition, Israel, by way of its academic scholars and supported by international agencies, attempts to cover up its traditional policies that encourage its cheap exhaustion of our water and natural resources and which intensify the imbalance in the natural environment, with an attractive development cover: "sustainable development." The same scholars try to accuse the Palestinians of destroying the environment of the West Bank and Gaza Strip.²⁹ However, Palestinian pollution of the environment and underground water remains marginal compared to the disastrous environmental practices by Israel (especially the leakage of wastes and waste water from Israeli settlements into Palestinian agricultural land and underground water). What is even worse is that international agencies have considered this Israeli violation as "status quo" advising that we, the Palestinians, recycle these Israeli wastes in order to contribute towards environmental protection!³⁰

2.5 Environmental Destruction

Presently, the Israeli occupation represents the most significant factor towards the destruction of the Palestinian environment. Israeli violations towards the environment take on several shapes, the most significant being the environmental destruction caused by factory wastes from Israeli settlements. These range from solid to liquid to gas wastes that cause health risks to human and animal life, in addition to destroying agricultural soil. It's not surprising to know that most factories in the settlements were denied licenses to operate within Israel due to the hazards they cause. The most dangerous industries in the settlements are the chemical industries (plastics, batteries, spark plugs, aluminum, leather, dyes, and others) which produce chemical compounds and acids that find their way to the soil. They pollute both the soil and air, causing soil sterility, and eventual desertification,³¹ Furthermore, poisonous elements are produced as a result of these industries, such as cadmium, chromium, and arsenic, that are destructive to the soil and underground water.³² Also, building materials, stones, and cement industries in the settlements are no less hazardous than the chemical industries in terms of their effects on the environment, agriculture and health.³³ An added hazard is the stonecutting compounds, which was set up by Israeli companies in the West Bank. Their thick dust and explosions cause not only desertification and environmental hazards, but also cause fatal health threats to nearby residents, livestock, agricultural land, fruit-bearing trees and green pastures.³⁴ Israel has made plans to set up more of these compounds in Wadi El-Teen in the Tulkarem area.

3 The Self- Imposed Factors in Substantiating the Distortion of the Palestinian Agricultural Economy

The Palestinian agricultural sector in the West Bank and Gaza Strip is characterized with its lack of planning and the inefficient distribution of its local production over the lengthiest period of time. Many farmers are cultivating only one or two types of crops, thereby increasing their risks for losses. However, in contrast, diversified agriculture ensures more economic stability in terms of the prices and marketing opportunities. Instead, farmers arbitrarily decide when and how much to grow of certain types of crops. Unfortunately, this results in a large surplus accumulation of the same crops for most of the farmers and during the same time period.

In consequence, the economic feasibility of picking, canning, or marketing becomes nil and given the nonscheduled abundance of these crops, farmers ultimately have no option but to sell for very low prices or even leave the crops unpicked at times. There are no national strategies for farmers to rely on by which they could diversify their harvests. Each farmer decides for himself which crops to grow depending on his financial capability. Most farmers also take on the responsibility of marketing their produce themselves. In the Jordan Valley area, considered the heart of winter cultivation, a large number of farmers grow the same types of vegetables, at the same time. The picking and marketing time is therefore during the same time period.

In theory, the Occupied Territories produce basic vegetables in excess of the consumption capacity but the period of production is short, requiring us to purchase these same products from Israel at a later time at an expensive price. The products we purchase later on could be products the Israelis had purchased from us earlier at a cheap price and frozen for out of season marketing. In the Toubas area, farmers occasionally are forced to sell a truckload of vegetables for 400 NIS (approximately \$100), at about 1 NIS (\$0.2) per box,³⁵ at the same time that the flow of Israeli products is unrestrained. At this rate, we cannot guarantee our goods will be marketed in coming harvests and certainly not within the next four to five years. The farmers know exactly the cost of production but they never can know how much profits their products will make because the market is subject to unpredictable conditions. The risks of production therefore for the Palestinian farmer are very high.

3.1 The Lack of Sector Articulation

It is clear that in the West Bank and the Gaza Strip we have no clear development strategy that guarantees articulation in the same economic sector and among the various sectors. Articulation means making one part of the economic sector serve another part of the same sector or another sector in order to establish an interaction among the different aspects of the same sector, on the one hand, and among the various sectors, on the other. Currently, the various sectors of the Palestinian economy are integrated with the Israeli economy.

The absence of ties between and within the various sectors of the Palestinian economy contributes to the dismemberment of the local productive power and decreases possibilities for the exchange of information in production and marketing. This lack of a working relationship between the various sectors and subsectors is leading to a delayed expansion of any given sector, and meanwhile maintaining sector subordination to material resources and the existing marketing process.

3.2 Practicing Unsustainable Agriculture

Agriculture is the most important source of economic livelihood for the Palestinian people. It is an essential part of our culture. Palestinian production not too long ago was plentiful and diversified; the Palestinian rural areas enjoyed self-reliance in all their food needs. Today, however, many Palestinians are jobless, and in fact, are going hungry.

In turn, not only does Israel confiscate and steal hundreds of thousands dunums of the richest agricultural areas, there are areas of arable land that remain unused, including areas surrounding the homes. To exasperate the situation, commercial buildings are presently being built on agricultural land areas.

Consequently, natural diversified agricultural production has greatly diminished, as has poultry and livestock raising at the home unit level. This means that large amounts of

home wastes are not recycled back into home production. Some family units still do raise poultry or sheep but if the organic wastes left behind are not reused, they become pollutants.

Practicing modern agricultural methods by Palestinian farmers has caused the extinction of many good traditional practices that have evolved over years of experience. Traditional practices have proved to be healthier and more practicable and advantageous than "modern" agriculture, which has only made the farmers more dependent on external resources and has entrapped them in debts, caused the degradation of the soil fertility, and caused other critical problems. Furthermore, the extensive use of hybrid seeds leads to the extinction of the non-hybrid varieties through the loss of genetic diversification. Furthermore, hybrid seeds have caused pests to attack the crops, which means the seeds require continuous improvement, and thus increasing loss of biological diversity.

In most cases, the extensive use of "modern" agricultural methods has not only caused the extinguishing of traditional pest-control methods but has led to many environmental, health, and economic losses. Despite the evident risks and losses, farmers readily use pesticides as the only solution to pest control.

The Israelis, like the distributors and representatives of chemical companies and hybrid seeds, continue to convince Palestinian farmers to turn completely to intensive modern agriculture or export-based monoculture. Many farmers in the West Bank and Gaza Strip bought into the ideas of these companies and purchased their chemical products and hybrid seeds. And so with the linking of the Israeli and Palestinian economies, all the agricultural needs of the Palestinians must be supplied by the Israelis. In fact, the agreements signed prohibit the Palestinians from purchasing the same materials from another source (though at a cheaper price). This means an increase in the costs of Palestinian products, compared to cheaper rates in neighboring Arab states.³⁶ Finally, the farmers have become addicted to using chemical fertilizers of which they must annually increase the quantity for the same land area because these chemicals gradually decrease the soil fertility. This applies also to chemical pesticides because their continued use has developed a resistance to these chemicals, along with soil degradation. Farmers are annually increasing the use of pesticides but only to find that pests are becoming more widespread, with even new varieties of pests appearing. Any control over the pests has only become impossible.³⁷ In addition, the dependence on large quantities of inputs from outside the agricultural production unit has led to an increase in the production expenses and debts, causing a substantial number of farmers to abandon their land for other jobs; thus, more agricultural land areas are wasted. Additionally, Israel's complete control over the borders and ports and the manipulative power of the international market has led to a serious decline in prices, and so a decline in Palestinian exports.

3.3 Chemical Chaos

Presently, the marketing of agricultural chemicals and their use are evidently chaotic

and arbitrary. Enticements presented by the Israeli suppliers, whether directly or through their local marketers,³⁸ contribute to this chemical jumble. It's worth mentioning that some have taken advantage of this situation to make a profit by selling imitation chemicals at the price of the originals.³⁹

In truth, Israeli chemical companies use the Palestinians as experimental subjects. After introducing new chemicals (which they produce or import) into our market, they then decide whether or not to allow them into their own market.⁴⁰ Presently, thousands of tons of various types of chemical pesticides (that are pathogenic and banned from use) are being used all over the West Bank and Gaza Strip. Of the total Palestinian agricultural production costs, it is approximated that the percentage spent on pesticides makes up no less than 35%, one of the highest rates in the world.⁴¹ Even worse, agricultural hand guides issued by both formal and informal institutions actually recommend the use of pesticides that have been banned internationally or have been banned in several countries due to the serious health and environmental damage at risk and the chronic and deadly illnesses they may cause in human beings.⁴²

In most cases, the chemical companies producing or marketing these products are usually the only source of information available to the farmers, agricultural engineers and extension workers. However, many researchers worldwide have proved the inaccuracy or even falsehood of most of this information. Its objective is solely commercial advertising.⁴³ This issue has uncovered another problem. It has become obviously clear that many engineers and extension workers are incapable of diagnosing agricultural disease or of prescribing treatment, since they advise the use of chemicals as a first option instead of making it the last one⁴⁴.

3.4 The Self-Imposed Factors in Destroying the soil and the Environment

Along with the objective factors related to the destruction of the environment (those related to Israel and its settlements) the Palestinians are also responsible for a large part of the problem. The Palestinian contribution towards the destruction of the land and the environment can be summarized as follows:

Firstly, there is the issue of the continuous shrinkage in the Palestinian land area that is being cultivated. This is not due only to Israeli annexation and judization of the land but also due to Palestinian policies and practices that are irrespective of the land and of food production. For example, large areas of arable land have been used for the construction of buildings.

Secondly, industrial sites are being established and thus shrinking arable land. The increased calcium levels in the land nearby these sites are caused by the wastes produced by these establishments. Soil fertility is therefore destroyed; along with it, plant life is destroyed and underground and surface water are polluted. Serious health and environmental hazards are also directly created by the stonecutting compounds that are dispersed in the agricultural and residential areas (most of which were licensed by the

Israeli authorities).

Thirdly, many of our farmers are concerned only with making the highest profits possible. They have a disregard towards the need to protect the soil; they may not adhere to the agricultural rotation or to practices that have proved successful in sustaining soil fertility and good soil production rates. As a result, soil problems are continually being intensified with the persistent increase in salinity and calcium levels (as found in Jericho, considered to have the worst type of soil in the area). Also, there is a high salinity level in the water used. Despite these facts, many farmers do not hesitate to use agricultural chemicals haphazardly. But the problem is in fact so severe that soil experts predict that if this behavior continues, part of the Palestinian land, especially in the Jordan Valley, will become sterile and unfit to cultivate in just ten years, except with the continuous use of large amounts of chemical fertilizers.⁴⁵

3.5 Intensifying or Modifying Technology

Some formal and informal agencies in Palestine are advocating intensive monoculture and luxury agriculture for the purpose of export. These "depend on advanced technology for production and which the Palestinians can apply easily such as growing flowers, fruits, and vegetables."⁴⁶ However, the problem of the Palestinian agricultural sector is not in the technology applied. Though many farmers have surpassed this issue, the problems of Palestinian agriculture and the economy have increased. The most important reason that farmers have incorporated export monoculture around the world is the subordination of their countries to the foreign markets and their desire to obtain hard currency, which only a minority of these populations actually benefit from. But export agriculture in the "Third World" states has led to intensifying the connection with imported and very expensive technology. For the "Third World," advanced technology means increasing agricultural output and satisfying the demands of foreign markets (the West) in terms of the specifications requested (i.e. the shape of the fruit, its size, diameter, weight, etc.). Palestinian agriculture that relies on "advanced" technology that is imported in practice means that we must export all that we produce in order to pay off the costs of imports, as is the case in all countries of the "Third World." Consequently, the "Third World" has fallen into an abyss of subordination, poverty, hunger, and malnutrition for the majority of the populations. In order to live up to the demands of the external markets, "advanced" technology in agriculture will eventually lead farmers away from producing basic foods for their own communities.

3.6 Model of the Formal Palestinian Role in Intensifying Palestinian Agricultural Distortion

The role of Israel, international institutions, and donors in distorting Palestinian agricultural development is clear and understandable. What is not clear is how some Palestinians themselves have contributed to this distortion. Lately, top state employees have forged certificates of origin for Israeli citrus fruits and other products, in order to facilitate the marketing of these products into the Arab World⁴⁷ as Palestinian-grown

produce.

Strangely enough, local institutions who have stood up for flower production and who have outspokenly called on farmers (especially in the Gaza Strip) to give up citrus fruit (because of high production costs) are today silenced as to the fabrication of this theory. The supposition that citrus fruit production is too expensive and that flower production is more profitable was only a way to strike at this traditionally significant sector (citrus production) in Palestinian agriculture in order to open the way for the flow of Israeli-produced citrus fruit to the Arab states, and ironically with Palestinian facilitation.

3.7 Examples of How Palestinian Farmers Destroy the Soil

The farmers in the Jordan Valley in general do not own the land they cultivate; landowning farmers are generally found in Naweighma and Al-Diyuk.⁴⁸ Where the farmer leases the land, he works by way of farm contracting. Big landowners, such as the Shu'Sha', Hamdouni, and Al-Husseini families own hundreds of dunums. Unlike those farmers who own their land, farmers who lease the land usually don't grow trees. However, planting trees would ultimately change Palestinian farming system.⁴⁹ Tenant farmers don't care to grow trees because their goal ultimately is to make the most profit by increasing production as much as possible. They are not concerned with safeguarding the soil. This is an example of a self-imposed factor in destroying Palestinian land and environment.

Another example of the farmers' role in destroying the soil is the negligence of farmers to till the land immediately after harvesting in order to get rid of weeds before they produce their seeds. Most of the time, farmers till the land when it is too late, and weed seeds are dispersed all over their land when they finally do till it.⁵⁰ Year after year, the farmers lose their ability to control the growth of weeds and begin to use herbicides.⁵¹ One of the most commonly used compounds, "Doctalon," is one of the "dirty dozen" (compounds scientifically proven to be carcinogenic and to cause genetic disfiguration in human embryos). This compound also causes the destruction of brain, heart, liver, and kidney tissue.⁵² There is no doubt that farmers who conform to correct, environmentally safe agricultural methods can reduce or totally abstain from using chemicals and thus avoiding major health problems.

Another example of chemical misuse is involved in the cultivation of watermelons. To grow watermelons, farmers usually use land that has not been used to grow vegetables, expecting a better yield. In the first year, the harvest is usually very good. However, in the second and third years, production declines due to diseases in the soil. Besides the fact that watermelons have surface roots that require high fertile soil, the high salinity levels and chemicals used kill much of the beneficial microorganisms that help to decompose the soil. Consequently, watermelon production fails.⁵³

3.8 Productive Cooperatives

Instead of growing their own agricultural produce and processing food items that meet the basic food needs of the public at affordable prices, food cooperatives instead process foods purchased from a second or third source, which raises the cost of production. While individual producers can produce the same item at a cheaper cost,⁵⁴ cooperatives can develop a complementary relationship between those that produce raw agricultural products and those that process the products.

Agricultural cooperatives should primarily be independent and self-sufficient, relying on their own funds and resources, and making use of what is locally available to them in order to meet the needs of their constituencies and the needs of the Palestinian society in general.

This however contradicts with foreign investment, which have contributed to the establishment of many of the existing agricultural cooperatives, that were designed to serve the purposes of Western funders. To keep funds flowing in, the major concern of the cooperatives is sustaining foreign support. It's worth noting that agricultural workers are not active in these cooperatives. These cooperatives are instead run by persons unrelated to agricultural work and lack the needed cooperative spirit. In fact, they are only a burden to the cooperatives.

3.9 Decline in Agricultural Work

In truth, agricultural work, and in fact all manual labor in general, is perceived negatively not just by university graduates in the cities but also by those living in the rural areas. Many college graduates, who were not fortunate enough to enter the white-collar market, would rather live off their families or would rather face the humiliation of working in the Israeli labor market than to work in agriculture in their own villages amidst their own people.

The successive occupiers of Palestine have tried to negatively influence succeeding generations by steering them away from productive work. They have succeeded in instigating the feeling of helplessness and incapacitation. Therefore, our youth and college graduates lost faith in the value of agricultural production.

3.10 Agricultural Counseling and Research

The problem with our "experts" and agricultural engineers is that they are highly influenced by the educational curricula and university literature of the West. They are taught agriculture that is based on the market economy and the large external inputs which were developed to satisfy climatic and agricultural patterns that are unlike our own and have nothing to do with the needs of our farmers.⁵⁵ Consequently, our farmers do not strive to use the local resources and capabilities. They do not subscribe to the local experience and knowledge that were developed by the preceding generations. They are also careless towards local crops and (non-hybrid) seeds and farm animals.⁵⁶ Formal agricultural "research" focuses usually on supporting the wealthy farmers who

can obtain the necessary equipment and materials for "modern" agriculture, which were developed to increase export-related agriculture. As a result, most farmers cannot apply the techniques that are originally unsuited for unirrigated agriculture and low external inputs systems⁵⁷.

Agricultural extension today does not cover all agricultural areas. Agricultural extension system is also very deficient in diagnosing the disease and in prescribing appropriate non-chemical treatment. Furthermore, the knowledge of the farmers and agricultural engineers on agricultural chemicals is limited to what is provided to them by the chemical suppliers.

Also, most agricultural experimentation activities do not apply their work to non-hybrid or local seeds that are appropriate to our environment. Their work does not apply to the actual conditions of farmers, who mostly rely on unirrigated cultivation, traditionally characterized with integration and diversification. It is no surprise that many techniques experimented or developed in research centers fail when applied to actual farming conditions.⁵⁹

What our farmers need is to formulate a new relationship between themselves and agricultural counselors and researchers in a way that will make the latter not just a means to channel information to the farmers. The relationship should be a participatory one aimed at developing and disseminating new and innovative agricultural methodology⁶⁰. Organizing workshops for farmers is important, not only to instruct them on up-to-date techniques, but because it is basically an excellent way to bring together different area farmers to exchange information. Since farmers in the various geographical areas face similar problems, techniques that were applied successfully can be shared amongst them.⁶¹ In this case, the farmers' innovations and experiences are at the core of research and extension work and not vice versa.

Women's participation in these activities and relationships must take a basic and deliberate part in agricultural extension because Palestinian women are the primary producers of food, since most of the current agricultural extension ignores the women farmers.

For an underdeveloped people such as the Palestinians, who possess few natural resources, the presence of diversified agriculture that satisfies the basic local food needs is a basic and determining factor towards economic independence. Producing our own basic foods ourselves is considered a fundamental characteristic of true sovereignty where we are free of the stranglehold of the external economies and markets. In order to get rid of Israeli dominance over the Palestinian economy, we must begin with independent agriculture that is free of external inputs.

4 Towards Alternative Self-Reliant Agricultural Strategy

The economic problems faced by the Palestinians, such as the spread of unemployment,

poverty, the low average wages, the large deterioration in the incomes, and the rise in prices substantiate the validity of alternative agriculture. Through popular self-reliant production endeavors, Alternative agriculture strategies call for local production for local consumption. Beginning with the land resources, alternative agriculture uses the locally available means to fulfill local food needs, unlike profit-based agriculture that only satisfies the demands of the external markets and a few profit-seekers.

From an economic viewpoint, given our present political-economic circumstances, it is preferable to adopt and apply a strategy that is based on local market oriented, instead of seeking to serve external markets. External trade is difficult to achieve with the oriented obstacles placed by Israel and other states and our lack of the advanced marketing systems of the West (which we cannot penetrate easily).

Currently, the present consumer and parasitic foundation of the market (private sector) and the public sector are unable to absorb the large number of unemployed people in the West Bank and Gaza Strip. It becomes evident here the importance of non-formal production systems, which provide alternative work opportunities for the local human resource surplus. Not only the unemployed but also many Palestinian labor workers and employees who earn the wages of poverty can compensate for their low wages. Through informal agricultural production that ensures an additional income or at least secures basic consumer items for their families, Palestinians may achieve a greater sense of security and well-being and escape subordination to their employers.

The most important aspect that will lead to the successful implementation of informal economic strategies is to ensure freedom of local production and popular participation in the development process. This represents an alternative to "emergency labor projects" which only provide temporary and very limited work opportunities, in the sense of "charitable work." These projects are a waste of funds that do not produce a local economic surplus. They are also a waste of our labor production capacity.

Instead of wasting money and resources in non-integrated production that relies on large external inputs and which produce wastes that are non-recyclable into the same production system, we can always adopt an integrated and diversified production system (plants, animals, and others). The system will use very little external inputs; organic wastes are reused, whether on a large agricultural production (commercial) basis or at a household production level. It can provide all or most of the household food needs; thereby, a large decrease in the spendings of the household occurs since most family expenses go towards purchasing food (which is relatively expensive for most Palestinian families). In addition to enhancing food security and self-reliance within the household, the system safeguards against unemployment, the lack of employment security, and economic-social instability. In addition, the system will guarantee the family nutritious foods that are free of disease-causing chemicals.

This developmental self-reliant production strategy is able to revive the traditions of the first two years of the Intifada, which took on the shape of mutual cooperation between

families and individuals when it came to the production of seeds, work, etc., in both the villages and cities. This system could also produce a surplus for marketing. To achieve this means taking the production initiative, instead of waiting for salvation from abroad. In conclusion, we must establish a foundation for structural change in our income-generation patterns, by making use of the various available resources.

Land and agriculture are considered the most significant source of livelihood and finance for the Palestinian people. Their presence is guaranteed and stable. Furthermore, they are basic to our folklore and culture. In the past, our agricultural production was plentiful, diversified, and provided a surplus for export; the Palestinian rural areas enjoyed self-sufficiency in all their food needs. Why then don't we direct our youth towards productive work on what left we have of land, whether on a mass production or individual basis, in order to become productive. We can at least obtain food sufficiency, and we may even market the surplus. Consequently we may finally achieve economic independence and social stability. What is needed is not agricultural development whose first and last concern is to make a commercial profit for a minority of people. In the Palestinian areas, particularly in the West Bank, there are large areas of arable land that are unused. In addition, there are large areas surrounding the houses that could be cultivated. There are many buildings, property and numerous areas that are unused or abandoned. So why aren't productive initiatives being taken in these areas. Such initiatives could include projects in agriculture, husbandry, agricultural processing, or food processing. Areas may be developed to allow for the recycling and reuse of the resources, wastes, wastewater and water harvesting, and other activities that improve our environment and that lead to the development of new food production and processing systems. Some activities will require quick elementary training and instruction by local or Arab experts, technicians and engineers, in cooperation with development and scientific institutions and local universities. These activities will ultimately contribute to community development and scientific research that is aimed at developing new production methods that use little external inputs (such as producing solar and wind energy or purifying water to make it drinkable). Such productive development strategies will certainly secure our food and our continued existence.

Where our water resources are concerned, we must first and foremost fight for our right for water sovereignty. In parallel, we must take full advantage of the natural water resources that are presently being wasted. We can set up large numbers of wells and sand dams in order to benefit from rainwater for agricultural and household use. We must also make use of the natural springs that are found all over the West Bank. Recycling wastewater is important in agriculture; irrigation water can be increased and environmental pollutants decreased. We must also encourage unirrigated agriculture and cultivation of crops that do not require large quantities of water. All this is necessary due to the limited water resources available to us since the availability of water is a basic element in any strategy aimed at increasing the quantity and quality of agricultural and food production.

Since we lack food security, agricultural export should be our last priority, not as it is today, the top priority, under the pretense of acquiring hard currency (and for whom?).

If an honest and real effort is made towards agricultural and food production that is aimed at producing essential food goods instead of export items, the need for export-based monoculture will decrease.

Here, diversification must be at the core of any national agricultural development plan in order to ensure the highest degree of food self-sufficiency, thus food security. Food self-sufficiency will decrease Palestinian subordination to the external markets and their demeaning standards. Agricultural diversification and processing will not just decrease Palestinian subordination to the Israeli economy and external markets, they will also ensure price stability of agricultural products and greater economic stability. Diversification contributes to maintaining improved soil quality and decreased agricultural pests. In conclusion, agricultural diversification and processing provide an incentive for the farmer to cultivate his land and hold on to it.

Agricultural development need not require advanced technology because genuine national development does not place profit within its list of priorities, especially if we are interested in a development that is based on self-reliance and decreased Palestinian subordination. We need to modify technology for our own needs and living priorities instead of running after "advanced" technology. To this end, we can encourage Palestinian technicians, engineers, factories and technical workshops in the West Bank and Gaza Strip to produce tools and machinery that meet the local production needs, in addition to providing maintenance and repair services.

4.1 Sector Articulation

As an example of sector articulation, agricultural production could be at a national or at a village level where self-reliance is achieved through an internally-based productive cycle. When a farmer harvests his land, he must also grow livestock, which will provide natural fertilizer for the land, limiting the use of poisonous chemical fertilizers. The farmer must harvest fodder plants (especially green grains) for the animals instead of buying feed from Israeli companies that control the supply and high prices. The irregular supply of feed for animals causes millions of dollars of losses for the dairy and poultry sectors, thus contributing to the shortage in production. The feed cost in animal production makes up 70% of the total expenditures in this sector annually.⁶²

Interrelated and integrated agricultural production projects can also be encouraged. A meat processing plant may be connected to a large group of livestock farms and to a local cans' factory. Livestock farms can also be connected to a dairy plant and to farmers who can use the organic wastes of the animals as natural fertilizer. The latter farmers can grow wheat and sell their grain on a contract basis to a regional mill that is in turn linked to bakeries and other food plants for which wheat is a raw material source. And so forth, agricultural projects and local industry may be linked to complement one another within an internally-based productive cycle that is balanced productively, economically and health-wise, as it continuously reverts production outputs back into the same productive system, reabsorbing organic nutrients back into

the soil.

This is a developmental perspective that does not place profits within its priorities. It treats agricultural development as a national project. Within this project, local production and consumption in the Palestinian community are what should determine the true value of the goods and the prices, which will be low compared to American or European or even Israeli goods that are produced with expensive wage labor.

4.2 Informal Economics

This informal agricultural development orientation is considered a national defensive strategy for the sake of economic endurance. It is informal because it grows stronger when unemployment is high, prices are high, and the average wages are low. Though economic activity is one that results in a specific material value, economists traditionally do not recognize material worth unless it can be measured in terms of its price in the market when the good or service is sold. This definition of added value is limited and insufficient because it ignores the economic-social activity of the informal economy, such as volunteer work, unpaid women's agricultural labor, gardening, household production, and so forth. Anyone who eats vegetables that are home grown, or who shares with his neighbors, is actually providing a product with a fixed value that the economic market does not recognize. The economic market only deals with commercial activity where a good or service is presented in the market, where it is traded according to a price agreed upon by the seller and buyer.

In this aspect the nature of rural living is more appropriate for productive, self-reliant informal economies. Many times, a farmer may use a plot of land, an unused room, a garage, or shed. These may also be used in the city but if they are unavailable, a collective activity can be organized where several individuals or families can join together in this type of production.

4.3 Note on "Sustainable Development"

Brandland's definition (1987) of sustainable development (satisfying our needs without jeopardizing the needs of future generations),⁶³ which supporters of "sustainable" development repeat, is not a sufficient definition. Only a few of the consumer goods in industrialized states can be actually considered "needs." The production process of most of these goods means more destruction to the environment and soil. It is the same in our case, though on a much smaller scale. A large part of the goods we consume (most of which are imported from Israel or abroad) are not basic and can be spared. Once we are rid of unnecessary goods, we can restore environmental balance and decrease the leakage of the accumulated monetary surplus into foreign markets. We can reinvest this surplus back into the local economy.

4.4 What is Self-Reliant Agricultural Strategy

When searching for investment opportunities in the agricultural sector, the practices, experiences, and patterns of natural agriculture, which were characteristic of Palestine and the rest of the Arab countries, are usually ignored. To a large extent, this serves the interests of chemical companies and "modern" agriculture. International funding institutions are also free to eliminate any developmental trend that may free farmers from the chemical chaos they have drowned in and their subordination to imported agricultural inputs, which would lead to great losses in the profits of these foreign investors. Since the occupation of 1967, the Palestinian community (in the West Bank and Gaza Strip) deviated from self-reliant production of diversified foods to economic and food subordination to Israel. Previously, most rural families, in addition to owning poultry and other livestock,⁶⁴ owned fertile land that prosperously yielded vegetables, fruit-bearing trees, and olive trees. Agricultural production patterns were at that time highly diversified and integrated. This meant beneficial relationships were built between the parts of a single agricultural production unit, with external inputs, and useless wastes minimized completely. The remains of harvests were used to feed animals, and animal organic wastes were used to fertilize the soil. Compost was prepared from a mixture of animal wastes and other organic wastes.⁶⁵ Also, many farmers allowed shepherds to herd in their plots, whereby it was fertilized. Farmers also rotated crops that complemented each other in the same plot, especially in land areas that directly surrounded their homes.⁶⁶ Agricultural diversification suited the local climate conditions, soil type and the various crops in a way that allowed for an integrated complementary system.⁶⁷ This greatly decreased losses and provided farmers with income and food security.

With the exception of some areas, such as the Jordan Valley, Palestinian agriculture was characterized as unirrigated, with low external inputs.⁶⁸ It provided food sufficiency for rural families. In fact, it even produced a surplus for export (such as wheat, for example).⁶⁹ Land plots didn't produce wastes (pollutants) because all or most of the wastes and outputs were recycled back into the land.⁷⁰

Actually, unirrigated agriculture (for example: Ramallah and the Salfeet area in the West Bank) is still partially practiced according to natural (traditional) agricultural patterns, meaning that external inputs and "modern" technology (maintenance, spare parts, chemicals, etc.) are at a minimum.⁷¹ This positive trend should be promoted by encouraging the use of simple tools and agricultural machinery that are manufactured locally, in addition to encouraging the use of animals, while applying whatever technology is appropriate for natural and unirrigated agriculture.

In addition, farmers who still use traditional natural agricultural patterns have not had to use large amounts of chemicals. These farmers still recycle or reuse agricultural and animal wastes as natural fertilizer for the soil or as fuel for mud ovens.⁷² This environmentally correct behavior should be encouraged by generalizing it or developing it so that it includes recycling products resulting from the slaughtering of animals and food wastes. Transforming these wastes into excellent organic fertilizer, soil fertility will be increased as rural families become more inclined to construct compost sites, or to transfer organic and food wastes into poultry feed, etc.

Several elements have contributed to the diminishment of traditional and formerly rich agricultural patterns. These elements, basically a result of the occupation, include such things as the annexing of large land areas, the robbing of Palestinian water resources, the transition to cheap wage labor in the Israeli labor market, and the adoption of intensified monoculture which requires large external inputs. Actually, the few pastures that were not annexed or closed off by the occupation have been exhausted by animal herding.

In addition, large land areas around settlements have become polluted by the settlement wastes and sewage, while water resources in these areas were also exhausted or polluted.

As a result of the increased number of wage laborers in Israel and other economies (thus the abandonment of agricultural land) and the transition of the Palestinian community into a consumer society that purchases most of its goods from Israel and abroad (the West Bank and Gaza Strip are considered the most significant and largest external market for the Israeli economy), Palestinian domestic capital accumulation has been lost as it is not reinvested locally in agriculture or industrial production. Also, the younger generation has lost its knowledge of traditional agricultural practices. At the same time, monoculture, high external inputs (especially in irrigated areas), and foreign (hybrid) seeds that have replaced non-hybrid seeds, have caused the deterioration in the diversification and interrelated ties that characterized past productive patterns. Consequently, the natural biological and ecological mechanisms of control over pests have been disrupted, resulting in the appearance of large numbers of new pests that were unknown to us only a few years ago. The use of imported agricultural chemicals (from Israel) has increased and the successful traditional methods of soil fertilization have nearly disappeared.⁷⁴ Today, animal livestock owners purchase animal feed from Israel.⁷⁵ In conclusion, production costs soared and farmer debts rocketed as well and the Palestinian society lost, to a large extent, its food security.

So as these are our economic-agricultural food conditions today, the first goal of any development strategy should be to ensure food security for the local community. Any other economic condition, such as increasing exports or investing in other economic sectors, should be marginal compared to this vital strategic goal. International institutions (the World Bank) and Israel practice all kinds of pressure on our farmers, through presenting temporary enticing benefits, to urge them into monoculture (export-based), under the pretense of acquiring hard "currency" and "adjusting" the balance of payments.

In order to achieve food security, we should be able to produce all our basic food needs, thus achieving food and economic independence from Israel. Though achieving political sovereignty is still a ways ahead, we can practice political control over our land, resources and living conditions, towards achieving food independence. This goal is more attainable to achieve, more realistic and represents a key to political freedom.

We can say that the alternative to the economic-agricultural policies and practices that

are dominant today is the implementation of a production strategy sustained by our own resources, experiences, and our rich traditions, producing food for local consumption (especially with the increasing population), and allowing local reinvestment of capital.

4.5 Release from Subordination to External Production Inputs

In analyzing the development problems of the West Bank and Gaza Strip and the current economic policies and strategies, which are founded on Palestinian subordination to the Israeli economy that only contribute to intensifying this subordination, we find that the only resort is a restructuring of our own developmental orientation towards a search for the roots of our development problems and towards reaching comprehensive cohesive interpretations. These interpretations must then be translated by all related institutions into qualitative change and development in economic production fields.

A major characteristic of Palestinian agriculture is its large dependence on expensive external inputs. This correlates with increased expenditures in production and increased prices of outputs. From here arises the need to encourage integrated production patterns that are based on natural and organic practices that are internally articulated, with little external inputs. This orientation is a basic and vital precondition to releasing our agriculture from external inputs from Israel and other markets and to guaranteeing diversified production and food security.

Tangibly speaking, if we really strive to break the Israeli grasp over the Palestinian economy and subsistence, and ensure diversified and secure food production, we must plan for agricultural patterns that avoid the use of chemicals. At the same time, we will be decreasing chances of polluting the environment, soil, water resources, and human beings. We must also develop environmentally safe agricultural patterns (patterns that are consistent with the environment and nature) in a way that allows natural processes and relationships to take their course. As a result, these patterns will maintain and improve soil fertility, effectively control diseases, pests, and harmful weeds. An important step towards achieving environmentally safe agriculture is restoring the production and use of non-hybrid seeds, though some native varieties have disappeared totally. For many years, hybrid seed and chemical companies have deliberately refrained from marketing non-hybrid seeds in order to market the hybrid brands. Seedlings of non-hybrid seeds allow farmers to collect and store seeds for the coming harvest from their own fruit, which cannot be done with hybrid seeds. Hybrid seeds also require fertilizers and chemical pesticides to grow. This in turn means a continuous deterioration in the soil fertility. Non-hybrid seeds however grow well with natural fertilizer. In other words, selfish commercial profit-making is behind the drowning of the local market in hybrid brands and their chemical necessities. Non-hybrid seeds are also the most suitable for our dry and semi-dry climate conditions. They do not require much water, unlike the hybrid seeds. It is important that farmers produce non-hybrid seeds yearly in order to use their seeds in the next harvest, especially with grains and vegetables. Nearly 12 years ago, many farmers in the Nablus area depended on non-hybrid seeds and seedlings which they produced themselves. Though they yielded a

lesser quantity, the native seeds resisted disease more effectively.⁷⁶ Farmers however are inclined to use hybrid seeds because they predict that they will produce more output and are easier to grow. However, they overlook the fact that they require more water, pesticides, chemical fertilizers, and many other services.⁷⁷

It is not impossible to bring back non-hybrid seeds; in fact they are found abundantly in areas where farmers grow household plots. But because of the dependence on artificial seeds and seedlings, that are perhaps more easily obtained in the market, farmers are reluctant to put in an effort to reproduce non-hybrid seeds in the traditional way.⁷⁸ For example, hybrid tomato seedlings in the market do not produce as many tomatoes as the non-hybrid seedlings despite the rapid and strong growth of the artificial seedling. The hybrid tomato seedling produces more fruit for a limited period during the harvest season whereas the non-hybrid one continues to produce for four months or more.⁷⁹ Additionally, hybrid seeds are more costly to grow. Another problem of hybrid seeds is that their roots do not grow deep into the soil. Non-hybrid seedling roots grow deeper into the soil in search of moisture even if they are not watered.⁸⁰ For example, the roots of non-hybrid wild cucumbers or tomato seedlings grow into the soil as long as the height of the highest bud in the seedling. However, hybrid seeds have short roots that require much watering, an added problem since Palestinian water supply is already scarce.⁸²

Therefore, in integrated unirrigated agriculture, the use of non-hybrid seeds is preferable.

Most importantly, we must consider the social and moral aspects of any agricultural system, which are no less important than the financial profits or losses involved.

In this context, establishing an integrated agricultural system means forming complementary links between the components of the system. In other words, the needs (inputs) and outputs of each component must be identified, consequently determining how these components integrate to form the system. The stronger the bonds between the components, the more stable the system and the more able it is to adapt to sudden change.⁸³

What is meant here is not introducing external elements or new inputs into the system but the reorganization of the components and resources of the existing agricultural units, so that the resources and energies are reintegrated into a single system.

To this end, the possible uses of the various unused outputs of an agricultural system must be determined, instead of throwing them out as wastes and contributing to land and environmental pollution. Then we must determine what inputs are needed by the system that are being presently satisfied from outside the productive system itself.

Finally, the inputs and outputs of an agricultural system must be linked together via determining the necessary inputs of the specific components and which may be met by

outputs of other components in the same system.⁸⁴ In other words, a well-designed internally integrated agricultural unit is the key to establishing a diversified and self-reliant agricultural production system. In this system, each element performs different functions at the same time, and several elements satisfy the needs of a single specified job. In addition, it avoids competitions between the different crops for resources and so provide the appropriate conditions that ensure that the soil is not being eroded away or the crops destroyed due to natural conditions (wind, ice, drought, etc.), or other circumstances.⁸⁵ Sheep, for example, are a source of food, fertilizer, income, etc. Land fertilization can also be achieved by adding tree leaves and branches, fertilizer, organic cover, and so forth.⁸⁶ We can also integrate olive trees with fodder plants and useful herbs and so forth.⁸⁷ In other words, we should make maximum use of the land area while avoiding competition between crops for light and other resources.⁸⁸ For example, windbreakers (oak trees, for example) along the borders of a land plot can act as protective fencing against harmful animals and strong winds.⁸⁹ Trees grown along retaining walls (carob, oak and grapevines, for example) contribute to limiting water and soil erosion.⁹⁰ Also, we can benefit from the fruit and leaves of these trees (grapevines, for example) and their wood (oak, carob, and other trees can be used as fuel). We can also benefit from their peelings and leaves as animal feed (peelings and leaves of carob trees, for example).⁹¹ Growing legume plants increases the ability of surrounding soil to preserve water and nutrients.⁹² In this system, planted herbs act as green fodder in the winter. They can also be harvested in the beginning of spring and stored as feed (straw). In addition we can make use of peelings and leaves of carob, olive oil sludge and wastes from olive tree pruning as feed⁹³.

Additionally, lost rainfall water that is left to stream between large rocks, hills and slopes must be harvested, redirected, and channeled into land plots. To prevent competition of harmful weeds with olive trees, the area surrounding the trees can be covered with an organic matter that prevents the growth of weeds and protects soil structure, maintaining its internal moisture. In fact, good organic coverage could allow us to get away with not plowing the land.⁹⁴

Furthermore, groups of families who grow their land can use manure (supplied from other groups) as natural fertilizer. This also applies to kitchen wastes, wastewater, etc. Sharing these useful wastes serve to strengthen the complementary and useful relationship between the various family production units, thus decreasing dependence on external inputs.

The traditions of integrated agriculture can be revived. Some examples involve herding animals on plots of land following the harvest, or setting up community (family) compost units (in either the village or city) or even cultivating currently unused land areas with fodder.

There are several commonly found trees in our area that make for useful components and wastes. An example are the cactus trees. Not only do they provide fruit and act as natural land barriers, their leaves can be used as fuel for heating, lessening or replacing olive oil sludge as fuel for ovens and instead use the sludge as a component in animal

feed.⁹⁵

In general, integrated and diversified agriculture advantageously effects production as a whole, and decrease chances of risks. In addition to preventing nutrient loss, this type of agriculture ensures the reinstatement of nutrients back into the soil.⁹⁶ For example, we can always increase the flow of nutrients and resources from one land area to another by transferring remains of olive trees (remains of pruning and leaves) to fertile agricultural land. Other forms of soil nutrients are manure (in the form of compost) and the ashes of traditional mud ovens.⁹⁷

In addition, experiments have shown that certain crops (that can survive in the margin of unused lands) can increase the economic feasibility of producing olives. Some of these are medicinal herbs, almonds, pomegranates, and figs.⁹⁸

At a regional level, diversified integrated food production not only means benefiting from the agricultural and food remains within the agricultural set up but also includes the use of large quantities of remains from food industries. Though they are disposed of as wastes, these remains possess much transformational energy. The reuse of most of these wastes does not require large financial investments or complicated technology. For example, we can partially make use of the pulp of citrus fruit that is left behind by juice industries. After treatment, the pulp is turned into feed for animals.⁹⁹

Some local researchers assure that banana tree leaves of the Jordan Valley can be a good source of fiber and minerals for animals. Presently, banana trees are cut down and destroyed when they grow old.¹⁰⁰ Strangely enough, we import from Israel not only raw feed components but also some secondary agricultural products which sheep feed on. Some examples are the peelings of soft green almonds. Palestinian almonds were in the not too distant past a major Palestinian crop. So we can revive and intensify their cultivation in order to make use of their remains as a source of local animal feed,¹⁰¹ in addition to the possibilities of using the liquid remains of olive pressing as an important component in animal feed.

In general, we can usually recycle most city wastes and organic remains from industrial processes and from our own human wastes. These become organic nutrients for the soil after appropriate inexpensive and easy treatment. Most of the time, wastes from food production are not disposed of in an environmentally safe and healthy manner, becoming a source of harm to public health. These wastes also lose their value as an important organic source for agriculture. We can even develop an industrial sector specialized in recycling organic wastes, in general, and the remains of food or agricultural production in particular. For example, we can transfer olive oil sludge (a product of olive pressing) into an animal feed product or we can extract coal from it.¹⁰²

We can also make use of the liquid remains of olive pressing in the production of cosmetics.¹⁰³ In addition, the remains of peels left over from juice factories or the remains of citrus production (the molasses of peels, for example) can be reused as highly nutritious animal feed. The manure and urine of naturally fed and well-nourished

animals act as excellent soil fertilizer.¹⁰⁴ Other beneficial organic practices include extracting and producing vegetable oils from citrus peels and other fruits, recycling olive, citrus and fruit seeds and recycling the remains of spoiled vegetables.¹⁰⁵

In solving the problem of the remains left behind the slaughter and preparation of poultry, and to save on funds spent to eliminate these remains and so provide additional income for slaughter houses, these remains can be treated and reused as chicken feed (a good source of animal protein). These can be packaged and sold to poultry farms in the form of powder¹⁰⁶.

Sixty percent of the wastes produced by the West Bank and Gaza Strip are organic materials (food remains, remains from poultry and slaughterhouses, paper, fur, feathers, wood shavings, the spoiled remains from the harvests, etc.). In agricultural areas such as Tulkarm or Jenin, the percentage is much higher.¹⁰⁷ These organic wastes can be transformed into "compost" and other forms of rich organic fertilizer for the soil. As a result, we can rid our agriculture of the various chemicals that destroy the soil, harm human health and pollute the environment and underground water. This can all be done through the transformation of wastes and organic remains into a food source for plants, animals and the soil, at very low costs, if at any cost at all.

The fundamental principle of recycling local resources lies in the fact that lost products or wastes resulting from any productive or consumptive system will become pollutants if they are not reentered into the same system or are not used again as inputs. Any product that is not reused is considered an environmental threat; if it is not decomposed into a safe matter(s), then it will remain a hazard both to the environment and to human health.

Therefore, diversification in plant and animal production, recycling resources and by-products, and treating the available land to us in an environmentally better way is considered more feasible environmentally, socially, economically and where our health is concerned. These practices also provide greater assurance of social and economic stability and food independence.

In conclusion, a profitable self-reliant production system supports itself on its own in a way such that the needs of its various components are provided from within the system itself. It is a system that knows no wasting in production nor does it produce lost wastes that cannot be reused by the same system.

4.6 Non-Governmental Organizations

Prior to the Palestinian autonomy and up to this day, agricultural services to a large degree have been weak or nearly non-existent in some areas, such as in the Toubas area (the largest Palestinian agricultural area), the northern Jordan Valley and the villages of the Qablan area (Nablus district) in the West Bank.¹⁰⁸ There are no loan services, nor do they have agricultural marketing services, loading, or packaging. They do not have simple agricultural tools or any agricultural inputs services (such as fertilizer, seeds,

seedlings, etc.) at low prices. Agricultural extension is very weak or non-existent in many areas. In general, there is an absence of true care and support for the farmer. No form of compensation exists for farmers who suffer annual losses due to Israeli measures, harvests that were not marketed, or natural disasters.

Under these unfortunate circumstances, some Palestinian non-governmental organizations (the Union of Agricultural Relief Committees, MA'AN Development Center/MA'AN, the Union of Agricultural Work, and others) have worked towards filling the gaps in the agricultural services provided. They participate in agricultural training and extension, small-scale agricultural loans, land rehabilitation, construction of agricultural roads, digging wells and constructing water collection tanks, and providing seeds and seedlings of vegetable and fruit trees for low prices. Some non-governmental organizations (such as the Agricultural Relief Committees and MA'AN) have conducted training for farmers and agricultural engineers and extension workers on the correct organic agricultural practices and techniques that involve little external inputs, such as water harvesting, producing seedlings, producing "compost," medicinal herbs, organic agriculture, and the management and recycling of water and grey-water garden design.

Other non-governmental organizations provide information on agriculture, water management, production projects and so forth, as well as try to influence formal agricultural policy- and decision-making. The efficiency and success of these activities are however undetermined. Many aspects must be considered: firstly, the size of the target groups and beneficiaries; secondly, the ability to reach the target groups; thirdly, the extent to which the services are equitably distributed; fourthly, the extent to which NGO's accomplish activities that are not being met by the formal authorities; and finally, the nature of the relationship between these non-governmental organizations and the beneficiaries and the extent that the beneficiaries contribute to the decision-making within these institutions and their programs.¹⁰⁹

Furthermore, due to the absence of agricultural research centers (both formal and informal) in the West Bank and Gaza Strip, non-governmental organizations (such as ARIJ and MA'AN) have produced a number of agricultural studies, and have printed agricultural pamphlets, supplements, and agricultural pages in the local newspapers.

In addition to the financial restraints, non-governmental organizations lack qualified development workers who are trained, experienced, and who are sensitive to the pains and suffering of the farmers. This has been a real obstacle to the growth and expansion of these organizations in terms of reaching a larger constituency and in terms of developing their staff. Formal governmental institutions usually deal with non-governmental organizations as if they were amateurs. Instead of cooperating with non-governmental organizations as partners, the government attempts at times to confine them or to integrate them into their own systems, or altogether brand them a branch of formal agricultural counseling.

In any case, some non-governmental organizations in the agricultural sector have been

characteristically working on training and agricultural counseling in participation with the farmers, in an attempt to identify agricultural research priorities. They also keep a lookout for new agricultural techniques and evaluate their feasibility.

Due to the financial restraints, and the weakness of agricultural services for farmers (counseling, training, marketing, loading, packaging and the provision of machinery and materials and seedlings for low prices, loans and funds and so forth) the development of cooperative ties between non-governmental organizations and formal agricultural research centers and institutions has become necessary. Non-governmental organizations can fill the gap created by the weak agricultural services especially in terms of the provision and distribution of agricultural inputs, such as non-hybrid seeds. Other activities involve providing counseling and technical services or developing existing agricultural techniques through allowing the farmers to try out the techniques for themselves in order to evaluate their practicability.

Some government agricultural services in "Third World" states have been greatly influenced by the methods and programs of the non-governmental organizations that are working in agriculture, such as participatory techniques and rapid evaluation.

Finally, foreign and international funding for the agricultural sector is marginal and insignificant. There is no doubt that the assistance and loans from the West to the Palestinians (governmental and non-governmental institutions) are no more than political "assistance" that appears to be based on "pushing forward the peace process." The assistance has nothing to do with building the infrastructure and true development. The sectors and projects that are selected for foreign funding are determined primarily by the "donors" in coordination with the World Bank and Israel. That explains why the donors only give marginal aid for productive investment in the agricultural sector. While the "democracy" and human rights programs received \$68.91 million of the total \$1,527 million paid by the donor states during September 1993 and May 1997 (that is more than 4.5% of the total funds donated at that period), the agricultural sector during the same time period was allotted \$18 million, less than 1.2% of the total "donor aid."¹¹⁰

The disregard and marginalization of the agricultural sector is founded on the fact that the sector is connected basically to the land and water. Consequently, donors are not interested in bypassing the Israeli-Palestinian agreements that grant political sovereignty of the land and water to Israel.

Conclusion

Findings and Recommendations

If we have agricultural export, then it should come second place to the provision of the basic food needs of the Palestinian people, achieved through local production. Agricultural export will then be based on diversified and organically (free of chemicals) produced crops. The demand for organically grown produce is rising in the international

market in general, and particularly in the West. Our farmers (Arab and Palestinian) can excel here and can profit from real strategic advantages in foreign markets competition, relying on our own local agricultural traditions that only ten years ago did not have the many pests that have come with "modern" agriculture.

Arab states have not yet succeeded in establishing a unified bloc that takes advantage of the "globalization" process and the related international agreements, such as the Gatt agreements, that call for the elimination of tariffs and other restrictions on foreign goods and monopolies which "must" be granted priority worldwide, and thus removing state protection of local products. However, members of bloc states have the "right" to not grant benefits and priority to products from non-members.¹¹¹

The establishment of such an Arab economic union is a vital strategic step towards protecting the Arab countries, particularly their agricultural products, which possess important comparative advantages¹¹².

In Palestine, initiatives in popular production that spurred at the start of the Intifada (late 80s) and which in fact set a cornerstone towards alternative development specifically contradict with the development concept of the World Bank. This concept, founded on the "free market" system, will sabotage Palestinian rural agriculture in the West Bank and Gaza Strip. How can a people under military occupation for long decades and which are victim to huge economic and political pressures penetrate the "international market" and face "free" competition? Though poverty, starvation, and tribal and civil wars in the "Third World" are the direct result of the "free market," the most significant "side effect" of the West is unemployment!

Decades ago, our farmers were unfamiliar with many agricultural pests that have emerged with "modern" agriculture. Pests at that time were not a major problem. With the natural processes they kept, natural balance was maintained between the pests and their natural enemies. Here springs forth the importance of encouraging the use of natural and organic resistance techniques against pests. Farmers and agricultural engineers and all those concerned can practice and develop techniques to protect plant and animal life from pests and take benefit from natural (biological) agricultural traditions. This does not mean excluding modern science from our agriculture. We can adopt new appropriate techniques that assist in controlling agricultural pests that traditional techniques have failed to resist.

We can also benefit from models in alternative agriculture that are being successfully applied in such "Third World" states as Cuba and India. Natural and biological techniques proved successful in resisting the soil and water deterioration caused by the un-sustainable and unstable agricultural production patterns that existed. Presently, the philosophy behind integrated soil management in Cuba is based on a number of techniques. In addition to integrated diversified agriculture, farmers are using nitrogen-fixing organisms in the soil, limiting as much as possible land plowing, improving soil quality through organic and biological fertilizer and compost (including worm

composting) and collecting city wastes for treatment and reuse.¹¹³ Other techniques also include biological methods of sustaining or introducing natural enemies of pests, such as some insect types, birds, and weeds.¹¹⁴

The application of natural preventative measures and traditional biological, organic and mechanical practices means achieving a balanced and sustainable agricultural system that decreases the use of external inputs, limits agricultural pests, and eliminates harm to humans, the environment, and the soil.

As a step towards supporting sustainable agriculture in the Arab countries and in Palestine, we must encourage the marketing of local organic agricultural products, as well as locally processed organic food, in the local market and grant it priority in the public institutions, schools, colleges and universities, etc. This will pave the way to the gradual elimination of chemically-grown local and foreign food goods.

On the other hand, there must exist a kind of complementary relationship between the Palestinian non-governmental organizations that are active in agriculture and community development and formal agricultural research centers and experimental stations. Non-governmental organizations can benefit from the scientific information provided by research, towards the development of simple local agricultural techniques that are inexpensive but profitable for the farmers. Non-governmental organizations can do more towards identifying the needs of the farmers and incorporating their knowledge with "formal" scientific agricultural activities in a way that correlates with the actual needs of the farmers.

There is no doubt that this will entail accommodating for the shortage in special technical skills and facilitating technical and professional equipment and information sources. Non-governmental organizations can accomplish this partially through the electronic communications revolution and the international non-governmental organizations network. They can also exchange information on the management of balanced agricultural techniques and practices that involve little external inputs and which are easy and cheap to apply.

Agriculture, that is based on the "economic market" and the large use of external inputs, was developed in the West to accommodate to climate and agricultural patterns that are different from our own and which do not relate to the true needs of our farmers.¹¹⁵

Consequently, there is an absence of a willingness to use the local resources and capabilities or to apply the experience and knowledge of traditional agriculture. Formal agricultural research usually supports wealthy farmers who are able to purchase the techniques and necessities of "modern" agriculture. Most farmers cannot apply these techniques that are unsuitable for non-hybrid and unirrigated agriculture that requires little external inputs.¹¹⁷

A problem that requires a solution is the fact that most agricultural research, experiments and the production conditions in researches and experimental stations are

not at all related to the local or native seed brands that are suitable for our climate and environment, or they are unrelated to the actual conditions of the farmers, who for the most part rely on unirrigated farming that is traditionally integrated and diversified. It is not surprising that many techniques that were applied or that were developed in these research stations have failed to meet the true needs of the farmers.¹¹⁹

Given these circumstances, the development of local agricultural research that can formulate sustainable agricultural patterns, requires researchers to take up a new practice. This practice consists of information exchange among the farmers themselves, who share similar problems. Farmers who live in different areas but who grow similar crops can share the knowledge they have acquired in applying or developing certain techniques and practices that have proved to be successful.¹²⁰ In this case, the innovations and experiences of the farmers are the focal point of research and extension work and not vice versa.

Finally, the basic precondition to our prosperity and survival is largely dependent on our protection of our scarce land and water resources. We must be able to secure our subsistence needs from our own local resources. This entails strengthening the principle of recycling local resources, thereby contributing to soil fertilization and increasing our natural wealths because all outputs of wastes that are not returned back as inputs into the same production or consumption system will become pollutants. This orientation, however, will not forsake us the need to struggle for our sovereignty on our natural resources and for our right to use and manage these resources.

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