**ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA**

EVALUATION OF AGRICULTURAL POLICIES IN SELECTED ESCWA MEMBER COUNTRIES:

A CASE-STUDY OF LEBANON
(POLICY ANALYSIS MATRIX APPROACH, PAM)

الجُمهورِيَّة اللبنَانِيَّة
مَكتب وَزِيرِ الدَولة لشُؤون التَنمِية الإدارِيّة
مَركز مشَاريّع ودرَاسَات القطَاع العَام

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ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

EVALUATION OF AGRICULTURAL POLICIES IN SELECTED ESCWA MEMBER COUNTRIES: A CASE-STUDY OF LEBANON (POLICY ANALYSIS MATRIX APPROACH, PAM)

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PREFACE

The present study was initiated by the United Nations Economic and Social Commission for Western Asia (ESCWA) in close collaboration with the Ministry of Agriculture in Lebanon. The First Economic Affairs Officer in the Agriculture Section of ESCWA served as a coordinator and in collaboration with Mr. Atif A. Kubursi, jointly analyzed the data and prepared this study.

The study has two main objectives. First, it is expected to identify distortions in the agriculture sector, and determine comparative advantage of major crops as well as recommend alternative policy options for eliminating distortions from agriculture, with the aim of encouraging competitiveness and enhancing efficiency. Second, it is anticipated that the spreadsheet computer model constructed for the analysis of policy matrices would serve as an operational tool for the monitoring of agricultural policies in the future as well.

The Policy Analysis Matrix (PAM) is used as an analytical tool to analyze the data. The PAM approach to agricultural policy analysis provides decision-makers and analysts with both a helpful conceptual model for understanding the effects of policy and a useful technique for measuring the magnitude of distortions. Through PAM one could measure the competitiveness, efficiency and the effects of policy-induced changes.

The study deals with the evaluation of agricultural policies in Lebanon, with special focus on commodity, factor and macro-economic and trade policy linkages. The possible impact of these policies on agriculture is assessed. It is expected that the study will facilitate the formulation of future price and trade policies, as it sheds the light on the level and magnitude of distortions (divergences) in the production systems as well as on the current status of comparative advantage of the major crops grown in Lebanon.

The Economic and Social Commission for Western Asia (ESCWA) would like to extend its thanks and appreciation to the Ministry of Agriculture, Ministry of Finance, Ministry of Trade, the Central Bank of Lebanon and the Council for Development and Reconstruction for providing both data and valuable advice, thus making it possible to produce the study in its present form.

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ACRONYMS

ASAP: Allocation System for Agriculture in Palestine
CDR: Council for Development and Reconstruction
CIF: Cost, Insurance and Freight
DRC: Domestic Resource Cost Ratio
EEC: European Economic Community
EER: Equilibrium Exchange Rate
EPC: Effective Protection Coefficient
EPP: Export Parity Price
ESCWA: Economic and Social Commission for Western Asia
FAO: Food and Agricultural Organization of the United Nations
FEER: Fundamental Equilibrium Exchange Rate
FOB: Free On Board
GATT: General Agreement on Tariffs and Trade
GDP: Gross Domestic Product
HCP: Handling Costs at Port of Entry
IMF: International Monetary Fund
IPP: Import Parity Price
ITMEER: Intermediate-Term Model-Based Equilibrium Exchange Rate
LBP: Lebanese Pound
MC: Marketing Costs
MTD: Measure of Total Distortions
NERP: National Emergency Recovery Program
NPC: Nominal Protection Coefficient
OPP: Observed Port of Entry Price
PAM: Policy Analysis Matrix
PC: Profitability Coefficient
PCR: Private Cost Ratio
PPP: Parity Purchasing Power
PVA: Private Value Added
SCF: Standard Conversion Factor
SDR: Special Drawing Right
SVA: Social Value Added
TCBM: Transport Cost from Border to Market
TCFM: Transport Cost from Farm to Market
TPC: Total Processing Cost at the Factory
UIP: Uncovered Interest Parity
UNDP: United Nations Development Program
UNRWA: United Nations Relief Work Agency
VAT: Value Added Tax
WAS: Water Allocation System
WB: The World Bank
WFP: World Food Program
WTO: World Trade Organization

I. INTRODUCTION

Due to its climatic diversity with more than nine different agro-ecological and climatic zones and its relative self-sufficiency in water resources, Lebanon with an area of no more than 3,950 miles, has always been a major producer and exporter of a variety of agricultural products. The fertile Bekaa region was at one time the main food producer for the entire Roman Empire

Throughout the 1950s and all through the early 1970s, the Lebanese economy grew rapidly and cumulatively. This high growth was characterised, however, by severe imbalances between sectors, and regions. Agriculture in Lebanon did not grow to its full potential and was constrained by insufficient government attention and encouragement and by an adverse macroeconomic regime that promoted services and trade at the expense of productive activities and by the over-valued Lebanese currency that promoted imports and discouraged exports and domestic production. Lebanese agriculture passed through many phases and challenges defined by clearly demarcated historic periods.

In 1974, on the eve of the civil war, agriculture contributed 9% to GDP, employed 20% of the labour force and sustained a rural population that stood at 14% of the total population. The agricultural sector's contributions to the economy were dwarfed by the rapid expansion of the overall economy but particularly by the unparalleled growth of the services oriented sector.

Lebanese agriculture could and should contribute more to the national economy. This could be realised through a more accommodating overall macroeconomic framework and through specific public policies that are more sensitive to the needs and requirements of a more productive and export oriented agricultural sector. It is inconceivable that the agricultural sector could flourish under an over-valued exchange rate and where scarce resources such as water are not valued at their replacement cost. Lebanese farmers have shown a great proclivity to use the correct factor proportions and to respond correctly and speedily to changed economic circumstances.[1] What is missing perhaps are the institutional framework and the correct signals that will allow farmers to adjust appropriately and correctly to economic signals and opportunities.

Lebanon's agricultural policy has always been conceived within the overall national economic policy framework. While, agriculture has been considered an important and critical economic sector, no special or specific policies have been developed to contradict or deviate from the general economic policy stance. Lebanon has pursued a liberal economic policy ever since independence. This policy restricted the role of the government to the development of the required social infrastructure and to maintaining an environment favourable to free trade. The public sector invested heavily in building an extensive infrastructure of trade routes, ports, airports, warehouses, and an excellent communication network. Nonetheless, this same policy framework also required the government to restrict its activity in promoting competing commodity producing sectors or regions that could undermine the dominance and the free flow of imports. The accepted liberal policy framework also called for a pro free trade, pro business policy environment with minimal government interference, low or no income or profit taxes, bank secrecy laws and a free foreign exchange market. This general framework restricted the policy options in agriculture.

A National Farm Data Handbook for Lebanon was published by ESCWA in 1999. In what follows a good use of the data collected and compiled in the Handbook is made to prepare the data base and the model of this study on the Evaluation of Agricultural Policies in Lebanon. The study identifies factors (both price and non-price) that currently constrain the efficiency and the sustainability of growth in the Lebanese agricultural production.

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1. S. Ahmed and A. Kubursi, "*Induced Adjustments and the Role of Agriculture in Economic Development: A Case study of Egypt and Syria*", in "Technology, Transfer and Change in the Arab World", (ed. A.B. Zahlan), Oxford: Pergamon Press, pp. 293-316, 1979.

A. OBJECTIVES

❖ The study analyzes and diagnoses policy related distortions in the Agriculture Sector;

❖ It determines comparative advantage of major selected crops;

❖ It identifies and recommends necessary policy options for eliminating distortions from agriculture, encouraging efficiency and enhancing competitiveness;

❖ The spreadsheet computer model constructed for policy analysis matrix serves as an operation tool for the monitoring of agricultural policies.

B. METHODOLOGY

The Policy Analysis matrix (PAM) is used as the analytical tool for the study. The PAM approach to agricultural policy analysis provides decision-makers and analysts with both a helpful conceptual model for understanding the effects of policy and a useful technique for measuring the magnitude of policy transfers. The PAM examines the objectives-constraints-policies frameworks in an operational context. The objectives-constraints-policies framework applies to macro-economic policy as well as to price policy. The Policy Analysis Matrix (PAM) brings together the interactions of macro-economic and agricultural sector policies so that the true (micro-economic) effect of such policies on the economy and private sector activities can be estimated. The PAM is essentially designed to measure the competitiveness, efficiency and effect of policy-induced changes by comparing private (actual) and economic (social) income (profit) of different policy interventions. The PAM measures three related dimensions of agricultural policy simultaneously: agricultural (farm or firm) income or profit, agriculture's contribution to national income or GDP and income transfers as a result of commodity, sector or macro-economic policies.

The study is organized in seven parts. Part I deals with the introduction; Part II describes the geography of Lebanon; Part III deals with the evaluation of the macro-economy; Part IV reviews the agriculture sector; Part V details policy analysis; Part VI contains results and discussions; and Part VII presents the conclusions.

II. GEOGRAPHY OF LEBANON

A. LOCATION AND AREA

Lebanon is situated in southwestern Asia, bordered on the north and east by the Syrian Arab Republic, on the south and southeast by Israel and on the west by the Mediterranean Sea. Its area is approximately 10,452 square km that stretches 225 km along the coast with a width varying between 48 km and 80 km inland.

Lebanon's topography, especially its location on the shores of the Mediterranean, its structure and its rock type, dominates the country's physical environment. It is a very narrow coastal plain extended along the Mediterranean Sea. Inland the land is dominated by two major mountain ranges: Mount Lebanon and Anti Lebanon that run parallel to each other down the length of the country. The Mount Lebanon range rises abruptly from the coastal plain; it is cut by numerous deep gorges and in the north contains the country's highest peak, Qurnet al Sauda, which rises to over 3,000 meters and is covered with snow most of the year. The other major range, the Anti-Lebanon, lies along the Syrian border in the east. In between the two mountain chains lie the elongated fertile plains of the Bekaa Valley through which the Assi and Litani rivers flow.

Administratively, Lebanon is divided into six provinces or Mohafazats. These Mohafazats are further subdivided into districts or Cazas, each having a mayor and a number of municipal councils.

B. GEOGRAPHICAL REGIONS

Despite the small size of the country, Lebanon's geographic structure includes a variety of contrasting features. Five geographical regions can be identified: The coastal zone, Mount Lebanon, the Bekaa Plain (Bekaa Valley), Anti Lebanon and Jabal Al-Sheikh, and South Lebanon (Jabal Amel).

1. *The Coastal Zone*

The coastal zone is comprised of the shoreline and the coastal plain. The shoreline stretches over 225 km between Arida in the north and Ras El-Naqoura in the south. It is characterized by deeply incised cliffs, revealing evidence of recently accelerated erosion. Gravel beaches, 20% of the entire shoreline, lie at the foot of the low cliffs.

The coastal plain is narrow and sloping along the foot of the Mount Lebanon range. It is very narrow along most of its length (averaging 7 km) but widens out to form the large sedimentary plain of Akkar in the North. The plain reaches 30 km in width and an elevation of 500m at the mouth of the Nahr el Kabir; it then narrows between Tripoli and the Jabal Terbol and eventually becomes a narrow strip of about 3 km, interrupted by the mountains in some places. This strip widens slightly towards Beirut, Choueifat, and Saida from where it continues uninterrupted with an average width of 7 km until the plain of Sour; it is then interrupted again by a series of ridges up to the southern border.

2. *Mount Lebanon*

Rising sharply from the coastal plain with few transitional foothills, the Mount Lebanon range extends from Jabal Akkar in the North towards Jabal Niha in the South, reaching a peak of 3,088 m in Qurnet al Sauda. The altitude in Jabal Niha is 1,809m, after which the mountains give way to the hills of Jabal Amel. The range runs about 160-km along the length of the Mediterranean coast, and its width varies from 25 km in the central part to 40 km in the northern part. Mount Lebanon is made up of two zones: The middle elevation zone and the high elevation zone.

The middle elevation zone is probably the most diversified area of the Mount Lebanon range in the country. After a steep rise from the foothills, a number of small plateaus form an intermediate gradation between the sea and the summit line. A series of parallel, narrow valleys extensively divide the western face

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of the range, and descend towards the sea carrying streams and rivers. On the other hand, the eastern slopes dominate the Bekaa plain and are generally steeper than their western counterparts. They contain only a few seasonal streams fed by melting snows in the winter.

The high elevation zone, characterized by steep elevations and escarpments, is an entirely different environment from the middle elevation zone. The landscape is denuded and dry despite the large amount of precipitation (over 2m of snow), due to moisture loss by evaporation. Beginning at about 1,800 m, the summit line is formed of large, rounded, grayish peaks, particularly in the north.

A naturally formed pass, Dahr al Baidr, (1,500 m) divides the Mount Lebanon range laterally along the east-west direction. The subdivision on the north of Dahr al Baidr includes the highest elevations. It forms an extremely large area easily distinguished by its tabular summits, which gives rise to a large number of springs at lower altitudes. The range on the south of Dahr el Baidr is rather narrower and elongated; therefore, it offers less resistance to erosion.

3. The Bekaa Plain

Known as Bekaa Valley, the Bekaa Plain is situated at an average altitude of 900 meters east of the Lebanon Mountains. It is 120 km long and about 8-12 km wide, reaching 25-km width at the level of the Hermel. Formed by a sharp fault on the west and by steeply inclined strata on the east, the Bekaa Valley is filled by geologically recent sediments. The slopes are gentle, with a crest situated near Baalbek at 1,100 meters.

The Bekaa Valley is the source of two rivers, the Assi and the Litani, which flow north and south respectively. The plain can generally be divided into two geographical areas: North-central Bekaa and southern Bekaa. The north central Bekaa area is the main drainage area and the location of the Litani springs. It includes the Nahr al Assi valley and extends to Houch al Nabi in the south. The Southern Bekaa, which extends from Zahle-Rayak area to Marjayoun in the south, is a rich agricultural area, and it produces a wide variety of vegetables, fruits, and root crops.

4. The Anti Lebanon and Jabal Al-Sheikh

The Anti-Lebanon (also called, Jabal AL Sharqi) and Jabal Al Sheikh are interior mountains located on the east of the Bekaa Valley. Although this mountain range has similar features as the Mount Lebanon range, it is less elevated and more complex. The high elevation- summit zone is a drought ridden high plateau about 30 km wide with an average altitude of 2,300 m (reaching a maximum of 2,616 m at Tallat Musa). The plateau slopes towards the south into an elevated plain (1,400-m) which creates a natural division between Jabal Al-Sheikh and Jabal Al Sharqi. Jabal Al-Sheikh extends over a distance of about 100-km from the area of Yanta in the north to Chebaa in the south. Its crests and slopes constitute the major watersheds of the streams flowing towards the Bekaa (west), the Lake Houla in Israel (south) and the plain of Aaouej in Syria (east). Thus, Jabal Al-Sheikh has a central role in intercepting and redistributing water in an otherwise dry area.

5. South Lebanon (Jabal Amel)

This plateau lies to the south of the Mount Lebanon range and is a land mass sharply dissected by a large number of streams flowing east to west. The relief is tabular in the western part, rounded in the middle section, and sharper towards the east, where it meets with Jabal Al-Sheikh.

C. RIVERS

Lebanon has many rivers and streams; however, there are no navigable rivers, nor is any one river the sole source of irrigation for its agriculture. Although rainfall is seasonal, most streams are perennial. The water flow from rainfall and snowfall is estimated roughly at 10 billion cubic meters per year, of which 4 billion is carried by surface flow in 40 rivers. Of these rivers, seventeen are perennial and originate from the

Mount Lebanon range with the exception of the Assi and Litani (Bekaa Valley) and the Hasbani (Jabal Al-Sheikh). Except for the Litani and the Assi, the rivers in Lebanon are quite short, for example, Nahr Abou Ali is 42 km and Nahr al Bared only 24 km.

Despite the heavy precipitation, agriculture in Lebanon is still dependent on irrigation; the rivers and watersheds are vital in this regard. Water has long been drawn from rivers to irrigate crops in the more arid areas, especially in the middle and low elevation zones of Mount Lebanon, and in the Bekaa plain. The Litani River has been dammed to create the Lake Karaoun reservoir; the water is used to generate power and provide some irrigation for agriculture in the surrounding vicinity.

In Lebanon, the rivers support the rich and diverse flora and fauna, particularly in the deep valleys where the local climate is mild. In the past decade, a number of small-scale fisheries have been established in Mount Lebanon and on the Assi and Litani rivers. At present, the rivers in Lebanon are under great stress from the concentrated urban development, industrial and agricultural activity along the coastal zone (affecting the rivers running to the sea from Mount Lebanon) and intensive agricultural activity and related industries within Bekaa (affecting the Litani).

D. SOILS

Formed by the interaction of rock type and climate, soils in Lebanon are typically Mediterranean in character, showing similarities in climate, exposure, slope, lithology and vegetation. Most of the soils are calcareous, except for the sandy soils formed on the basal cretaceous strata. The most widely represented soils are the Terra-Rosa (a type of clayey, reddish soil formed from the mountain limestone) and a variety of alluvium. Richer alluvial soils occur along the coast in the Bekaa Valley and the northeast.

Soil cover is non existent in the steep landscapes of the Lebanon and the Anti Lebanon ranges, where the interaction of solar heat and mineral-bearing ground waters has produced a thick rock-like layer below the surface of the soil, which inhibits the growing of deep-rooted crops. The soils in the mountains and hilly lands are also fragile and prone to erosion. Relief, rainfall intensity and runoff quantity contribute to intensifying water erosion, especially where the protective vegetative cover has been lost. The magnitude of soil erosion in the country is witnessed by the stratification of alluvial outwash terraces of the coastal rivers.

E. CLIMATE

The climate of Lebanon varies from a Mediterranean subtropical characteristic weather along the coast and in the Bekaa Valley to a generally cool one in the upper mountains, some of which are covered with snow for most of the year. Summers are hot and dry while winters are mild and humid. Frost is rare at lower elevations. The influence of the Mediterranean Sea and the topographic features account for the wide variability of ecosystems and microclimate in the country.

1. *Precipitation*

The major part of the annual precipitation occurs in the rainy season, usually after December. However, there are large seasonal variations in the quantity and intensity of rainfall as between 80-90% of the annual rainfall falls between November and March and less than 5% falls between May and September, with some violent downpours resulting in serious flooding and erosion.

On the coastal area, mean annual rainfall ranges between 700-1,000 mm, increasing along a south-north direction. In the Mount Lebanon range precipitation can reach over 1,400 mm per year mostly as snow. Rainfall declines rapidly on the eastern facing slopes of the Mount Lebanon range, reaching only 600 mm on the foothills. The Mount Lebanon range shields the Anti Lebanon Mountains and Bekaa Valley from the influence of the sea which results in considerably less precipitation and humidity and a wider variation in temperatures. Precipitation on the Anti Lebanon range is around 600 mm, and peaks at over 1,000 mm in the Jabal Al-Sheikh while in the Bekaa plain it ranges from 800 mm in the South Bekaa to below 200 mm in the

extreme northeast of the plain.

2. *Temperatures*

In the lowlands, the mean annual temperature is 26.7° C (80° F) in summer and 10° C (50° F) in winter. The mountainous region is somewhat cooler. January is the coldest month with daily mean temperatures falling to - 4 (C in the mountains and 7 (C in Saida, on the West Coast. The warmest months are July and August, when mean daily temperatures can rise to 28 (C in the mountains and 33 (C on the coast. The variations between day and night temperatures are mild on the coast (6 - 8 (C), but peak in the Bekaa plain where they can reach 24 (C during the summer.

3. *Relative Humidity*

On the coastal area of Lebanon, humidity is reasonably consistent, at an average of around 70% with slightly lower values in the South. The fluctuations are more significant in the mountains where humidity ranges between 70 - 75% in winter and 50% - 60% in summer. The winter values for the Bekaa are approximately 80% but drop sharply to 48% during the summer in North Bekaa.

F. VEGETATION

In Lebanon, vegetation is adapted to the Mediterranean climate with its relatively short rainy periods and its long dry hot summers. Meanwhile the climatic and latitudinal variations produce a variety of plant lives. There are two distinct groups of vegetation in the country.

One group of vegetation is the Mediterranean group, which includes the pre-humid, humid and sub-humid zones, prevailing on the western slopes of Mount Lebanon and on the northern exposed semi-arid zones. This type of vegetation receives large amounts of water from run-off or precipitation from Jabal Al-Sheikh, the eastern slopes of Jabal Barouk and Jabal Niha. The original climate vegetation of the western slopes of Mount Lebanon is constituted of oak and conifer forests, representing the most ecologically diverse part of Lebanon.

The other type of vegetation is pre-steppic group. Lebanon is largely pre-steppic except for Jabal Al-Sheikh, and the eastern slopes of Jabal Niha and Jabal Barouk. The summit line is occupied with sparse shrubs.

Steep slopes, intensive rainfall, the long dry season, and the calcareous nature of the soil are some of the environmental factors which are not conductive to the preservation of the vegetation in the mountains. The fragile ecosystems intensified by anthropic activity induce rapid, irreversible soil erosion. In these cases, open scrub formation of the guarrigue type replaces the forest.

The collapse of the dry land farming system and the dwindling of agricultural activities in the immediate vicinity of some villages are caused by both external and internal migrations which have also been the main agent in land abandonment. As a result, many of the ancient terraced mountain lands have, in some cases, completely lost their natural cover, and currently suffer from severe erosion. The agricultural land, which has been abandoned for extended periods of time, has reverted to a poorly productive natural state, mainly grass communities and dwarf shrubs.

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III. EVALUATION OF THE MACROECONOMY
A. PRE-WAR ECONOMY

Lebanon has a long history of open and free market economy. The country is relatively small in size but economically diversified, with the state sector being traditionally small. The Government has a history of minimal intervention in economic activities and is supportive of private sector initiatives. The Lebanese economy having been dominated by the private sector is renowned for its lassisez-faire policies, its small public size, and its entrepreneurial tradition. The private sector's friendly policies of the different Lebanese Governments have always represented the country's comparative advantage and have recognised its economic potential.

Prior to the onset of the civil war in 1975, Lebanon enjoyed a long period of stability and economic prosperity, which provided the framework for a steady economic growth and relative financial stability. Its economic success in the 1950s and throughout the 1960s as well as the early 1970s was the outcome of several factors. A central feature of the Lebanese economy was the high ratio of investment to GDP. In fact, this ratio, on average, had rarely fallen below 20 until the eve of the civil war. Starting with a capital-output ratio of about 2.47 (see Saidi, 1986), this investment ratio could have theoretically supported an annual GDP rate of growth of about 8 percent, which was in fact typical of the Lebanese economy for much of the pre-war period. Given that services accounted for more than sixty percent of Lebanon's GDP, the 20 percent investment ratio understated the magnitude of investment per unit of output in the commodity producing sectors of the economy, particularly agriculture. A high investment to value added originating in commodity producing sectors explains the relatively high capital-labour ratios in these sectors of Lebanon before the war. This, in turn, explains the relatively high labour productivity indices that were generally observed in Lebanese manufacturing and agriculture before the civil war.

The pre-war economy of the country at best could be described as dynamic and characterised by high rates of economic growth, low inflation, large balance of payment surpluses, small fiscal deficits, and a floating stable and fully convertible domestic currency

Another central feature of Lebanese development before the war was a young and growing population heavily investing in education and supplying a dynamic, well trained and highly motivated labour force (Saidi, 1986). Lebanon had the highest adult literacy rate (73.5%) in the Arab region and one of the highest among developing countries (Richards and Waterbury, 1990). This domestic skilled manpower was supplemented by a large pool of inexpensive semi-skilled Palestinian workers trained by UNRWA at little or no cost to Lebanon and a large group of unskilled seasonal immigrant Arab workers from neighbouring countries, particularly from the Syrian Arab Republic that came to work in construction and agriculture. Estimates of the foreign labour force in the early 1970s put the total number at about one third of the national labour force (Khalaf and Rimlinger, 1982).

Regulations impinging on the functioning of markets for goods and services, labour, capital, as well as trade were limited, and tax burdens were light in comparison with other countries at a similar stage of development. Lebanese pre-war prosperity had also much to do with the fact that Lebanon played an important role as a key economic intermediary between the developed economies of Europe and the developing economies of the Middle East. Because of this combination of stable macroeconomic environment, liberal economic stance, in addition to its role as regional intermediary, Lebanon gained a strong comparative advantage in the services sector of its economy, particularly in banking and finance, tourism, insurance, and trade-related services. However, agriculture and industry remained relatively less developed in comparison to the dynamic and well-developed services sector.

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B. ECONOMY DURING THE CIVIL WAR, (1975-1990)

The Lebanese civil war, which started in 1975, inflicted a heavy toll on human and material resources and caused fundamental changes in the economy. The uninterrupted and continuous growth that began in the early 1950s was just as solid in the 1960s, as well as 1970s. Furthermore, a new vigorous economic spurt was just about to begin fuelled by the emergence of a vibrant and dynamic small scale manufacturing and agricultural activity that was primarily export oriented. The war blunted this growth and sent the economy reeling on a contracting spiral that lasted over 16 years.

. The impact of the civil war on social conditions and on human capital was grave. Much of the country's physical and human resources were actually destroyed. Perhaps the most long lasting damage was that of the profuse brain drain triggered by the war. Professionals and skilled workers with international transfer prices emigrated leaving behind semi-skilled or unskilled workers to fend for themselves. Losses in productivity were experienced in most sectors and real incomes of the unskilled plunged sharply exacerbating an already iniquitous and skewed income distribution system. Conservative estimates of net emigration suggest a total of 740,000 people had left Lebanon between 1975 and 1988 (Labaki, 1989 and 1990). Another 240,000 are believed to have emigrated in the first eight months of 1989. Eighty percent of all Lebanese emigrants to Arab oil producing countries between 1975-82 had some technical qualifications. In the mid-seventies over 50 percent of the emigrants were part of the labour force. In the 1980s this bias was toned down to 25-30 percent as earlier emigrants gathered their families.

The mass emigration was accompanied with loss in professional and entrepreneurial skills. This out migration of talent and skills could have been partially compensated for by fresh crops from the educational system. The Lebanese educational system did, however, suffer too as good and experienced teachers left the system and schooling days were cut short by frequent and incessant fighting. The growing and dynamic population that was heavily investing in its education and training was replaced by a declining population with less years of schooling and little or no on-the-job training. While more than one third of the Lebanese emigrated between 1975 and 1989, less than a third of them have returned between 1990 and 1997.

Employment levels recovered slightly in the mid-1980s, but slumped again in 1989. The consequences of this major slump in employment have been drastic. They have had, however, a differential impact on the various sectors of the economy. In the early 1970s manufacturing activity grew faster than most other economic activities, but only slightly faster than commerce, hotels and the restaurant sector. The result was that the earlier dominance of services in the economy was unaltered. The Lebanese economy remained a basically service-oriented economy with services accounting for 50 percent of total employment and about 70 percent of non-agricultural employment shortly before the war (Khalaf and Rimlinger, 1982). The largest drop in employment following the start of the civil war was in the construction industry where employment losses exceeded 72.2 percent (Khalaf and Rimlinger, 1982). The construction sector suffered more than any other sector, despite the fact that other sectors were comparably sensitive to political instability, because the construction workers in Lebanon were recruited to work in the Gulf region which was then embarking on a massive development program to construct its infrastructure following the explosive increases in oil prices and oil revenues. Public sector employment did not change much as the Government resisted to down-size its operations despite the drastic fall in its revenue. Agricultural employment registered an increase in absolute and relative terms as the agricultural sector acted as a buffer sector which absorbed large numbers of people from the urban areas that sought refuge in the rural areas and who would otherwise have been counted as unemployed (see Table 1). In a very special and unique way the contributions of the agricultural sector to GDP increased in absolute terms although a minor decline was registered in the relative contributions of this sector to the overall economy between 1970 and 1979, Table 1. The emigration of workers was accompanied by a flight of capital, and Lebanon's access to flows of foreign capital was much reduced. The total damage of physical assets sustained during that period exceeded $25 billion and human capital losses were matched by massive losses in physical capital that was either destroyed or lay wasted. All major sectors of the economy sustained widespread destruction of infrastructure and the obsolescence of remaining production capacity due to the reluctance to invest in new capital and / or spend funds on maintenance that

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caused under utilisation of capacity and raised cost of production and distribution. Few repairs were made and new investment virtually ceased during war years. Actually, net investment turned negative for most of the years between 1976 and 1989.

Table 1. Sectoral Contribution To Lebanon's GDP, 1970, 1979
(at factor cost and in million US dollars, at current prices)

	Total GDP	Agriculture	Mining & Quarrying	Manufacturing	Construction	Services
1970	1488.5	136.1	---	202.2	66.7	1083.5
1979	2523	215.2	76.1	391	86.3	1754.4
Percentage Sectoral Contribution to GDP						
1970	100	9.1	---	13.6	4.5	72.8
1979	100	8.5	3.0	15.5	3.5	69.5

Manufacturing includes electricity, gas and water.
Source: Sayigh, Y.A. The Arab Economy: Past Performance and Future Prospects. Oxford: Oxford University Press, 1982. Tables 18 and 19.

Meanwhile, Lebanon's public finances deteriorated significantly due to the lack of central Government authority in the country and to the consequent inability of the authorities to collect revenues while continuing to provide a minimum of public services. New additions to the capital stock were below the depreciation rate. While it was difficult to conduct extensive and complete surveys of the total damage inflicted on the economy's capital stock during the war, the Council for Development and Reconstruction (CDR) completed some partial surveys shortly after the cessation of hostilities that presented some benchmarks of these damages. The evidence collected by the CDR suggested that the Lebanese capital stock suffered on two important counts. First, there was considerable evidence that the existing capital stock was over used during the war with little or no maintenance or replacement. The typically high investment to GDP ratio of 20 percent before the war declined to less than 3 percent by 1985 (Saidi, 1986) and to even lower magnitudes in 1989. The Lebanese simply consumed their capital. While the ratio of gross investment to real capital exceeded 8.2 percent in 1974, this ratio declined to below 1.2 percent in 1985. There were enough indications that pointed to an even lower ratio in 1990. Second, there was extensive and massive destruction of buildings, bridges, power stations, schools, refineries and factories that the capital stock stood at less than 45 percent of its 1974 level, Table 2. Estimating the capital stock losses using the concept of potential capital stock (that level of capital that could have been accumulated had the war not happened and had Lebanon maintained its pre-war capital formation levels), would result in a decline in its level to less than 32 percent of the pre-war capital stock.

Moreover, the flow of goods and factors of production was also disrupted as a result of fragmentation of the economy. Markets were segmented and an already small economy was fragmented into yet smaller "enclave" economies with even smaller goods and labour markets. This fragmentation increased the transactions cost of exchange and production and reduced measurably the productivity of the economy as goods and labour were not allocated efficiently to their best uses and where the efficient economic size of producing firms was further compromised. Exports markets particularly of agricultural products were also curtailed as foreign importers diverted their demands to more reliable and secure suppliers.

Table 2. Gross Investment and Capital Stock, 1974, 1982-1985,1989
(Million of LBP.)

Year	I	K	(I/RGDP)	(I/K)	(K/RGDP)
1974	1,644	20,133	0.202	0.082	2.47
1982	298	12,089	0.05	0.025	2
1983	229	11,230	0.039	0.02	1.91
1984	173	10,393	0.032	0.017	1.9
1985	118	10,095	0.024	0.012	2.05
1989*	108	10,800	0.02	0.01	2

Source: Saidi, 1986
* My own estimates

Notes: I denotes gross investment at constant 1974 prices.
          K denotes capital stock at constant 1974 prices.
          (I/RGDP) denotes the investment output ratio.
          (I/K) denotes the ratio of gross investment to capital stock.
      (K/RGDP) denotes the capital-output ratio.

Large fiscal deficits were financed primarily through the banking system. The consequent rapid growth in liquidity compared with economic activity, and the erosion of private sector confidence, led to continuous pressures on the Lebanese pound in the exchange market, increased inflationary pressures, and resulted in high levels of currency substitution. A rampant inflation fuelled by currency speculation, declines in domestic production and unchecked monetary expansions was an early product of the war. The economy was shielded from the full vagaries of this situation in the early years of the war as the economy was still receiving enormous remittances from Lebanese working abroad and aid from friendly Governments and other sponsors. Besides the Government was still in a position to collect some custom revenues.

As the war proceeded unimpeded, remittances started to decline, help dried away, traditional Government revenues were usurped. The government was forced to lean heavily on borrowing from the commercial banking system and from the Central Bank. Borrowing from the latter was tantamount to printing money. Borrowing from the former was constrained by the ability of Government to pay back interest and principal. To the extent that interest on the public debt grew larger than the normal revenues of Government, the public sector fell into a state of de facto bankruptcy. The Government had occasionally resorted to shoring its finances by using Article 115 of the Lebanese Code of Money and Credit which credits the government account (treasury) with the foreign exchange revaluation gains (losses) on the Central Bank holdings of gold and foreign exchange reserves. This had the unfortunate consequence of tying the interest of Government to depreciating the value of the Lebanese pound and drove the Central Bank into pro-cyclical speculation.

Throughout the war period the increase in the velocity of money did not keep pace with the huge increase in money supply; the public preferred instead to shift its holdings of liquid funds into foreign currency deposits. Actually, from 1986 to 1987, the money supply, M2 jumped from LL 293 to LL 1402 billions-- a fivefold increase, whereas the velocity about doubled increasing from a value of 3.49 to a value of 6.32. The impact on local inflation; however, is the sum of the increases in the monetary base and velocity. Shifting deposits into foreign currency accounts helped moderate what could have been a worse inflationary bout, but this reduction in the private sector's desire to hold pound-denominated liquid balances exacerbated the pace of depreciation of the Lebanese pound and the linkage coefficient between inflation and depreciation.

Furthermore, during the war years the banking system was weakened considerably and Lebanon's role

as a regional intermediary was greatly reduced. To make matters even worse, the Government purchased a considerable amount of weapons to tighten its grip on the shaky political situation and diverted funds away from foreign reserves to finance these purchases. Foreign reserves decreased from $1883 to $652 millions from 1983 to 1984. As a result of this considerable contraction in foreign reserves, the Central Bank's ability to adopt pre-emptive policies decreased, and with it its power (or perception of loss of power) to counteract the attempts of speculators to alter the exchange rate in order to reap extraordinary profits.

There is an inextricable link between the inflation rate and Government deficits, and between the inflation rate and the exchange rate. But these links are so complex and dynamic that it is often impossible to draw the direction of causation or to assess precisely the relative contribution of the various factors.

Deficits were primarily financed by borrowing from the Central Bank, this increased the money supply, raised inflation, depreciated the Lebanese pound, increased the government's cost of operation which raised further the deficit, increased the borrowing from the Central Bank and again raised inflation and further depreciated further the Lebanese pound. The economy was caught into a vicious circle of deficits, inflation and depreciation. Adding to this the impact of inflation on the exchange rate, there was another dynamic spiral that worked against the Lebanese economy. Higher inflationary expectations triggered a flight from the Lebanese pound into dollars thus depreciating further the value of the pound. In turn, it raised the domestic prices of imported goods (these typically account for over 70 percent of total domestic supply) which added new fire to inflation and the spiral proceeded unchecked on its own. The only check on this was the price elasticity of demand for imports, which actually acted to constrain the vagaries of this dynamic spiral.

Increases in money supply are not necessarily inflationary. They become so to the extent that the increase in supply was not matched by an increase in demand. Actually, the situation in Lebanon was one of generalised excess supply of money as demand faltered under pressure from continuous declines in GDP, a rampant inflation and a cumulative tendency towards currency substitution and capital flight. Decreases in output provoked commensurate decreases in the demand for money for transaction purposes and the rampant inflation enticed economic agents to flee away from the Lebanese money into safer assets. The rise in world interest rates at the time intensified the currency substitution process and the spread of dollarization of the Lebanese economy. In 1985, domestic currency denominated deposits amounted to $4,013 millions and foreign currency denominated deposits to $2,478 millions, whereas in 1987 they were $270 millions and $3,222 millions, respectively. The Lebanese pound depreciated sharply from a level of LL 2.2 for $1 in the early 1970s to a low level of LL 2,200 in the summer of 1992.

Inflation distorts the pattern of investment away from productive endeavour and into speculative and socially undesirable allocations. It further imposes a tax on the private sector, plays havoc with income distribution favouring those with market power to protect their real income and disfavouring the weaker classes and those on fixed incomes or those who are incapable of adjusting their incomes sufficiently to maintain their purchasing power. It also hurts an economy that needs to export to pay for its mounting imports.

Inflation increased the volatility, uncertainty and risk factors in economic calculations in addition to those directly associated with the war. This contributed further to the deterioration of the operating economic environment and its predictability, and finally compromised the competitive posture of the economy against its trading partners with lower inflation rates. Given that Lebanon, up to the eve of the civil war had no or little inflation, the hyper inflation of the 1980s saw the cost of a bundle of goods that normally were LL 10 in 1974 go as high as LL 741 in 1987 and as high as LL 1500 in 1989. With the demise of the private sector and the erosion of the middle class, the public sector had to shoulder a number of responsibilities that were not within its domain and was ill prepared and equipped to deal with them.

Nevertheless, Lebanon continued to maintain an exchange and trade system that was almost entirely free of restrictions on payments and transfers for current and capital transactions, along with liberal investment policies and an open market economic system. During the war, the public sector increased its

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relative size from about 15 percent of GDP in 1974 to over 39 percent in 1989. In the pre-war years, the Government did not participate actively in the economy and did not practice counter-cyclical policies-- a feature characteristic of most advanced countries. Between 1965 and 1975, the Government did increase its share either in domestic production or direct management of the macroeconomic affairs of the economy(see Saidi, 1986).

The Government was forced into a new stance; real government expenditures increased throughout the war at an average annual rate of 5 percent suggesting that nominal expenditures had increased faster than inflation. With real revenues declining and with the private sector downsizing its operations the Government attempted to absorb part of the slack in the economy and to subsidise consumption of some essential goods. It also continued its operations but primarily with an ambitious rearming scheme of the Lebanese army without linking these schemes to its revenues, foreign exchange reserves or the wholesale absenteeism and low discipline of the public service. The public debt (a phenomenon unknown before the war) climbed to 98.4 percent of GDP in 1990. Interest payments on the debt alone grew larger than Government revenues from normal sources.

Not all the war effects were negative. Some aspects (a small set) were indeed positive. These relate to the reduction in imports, depreciation of the currency to levels that were more supportive of exports, the revitalisation of local agriculture and manufacturing and the reinvigoration of rural and mountainous regions. The depreciated value of the Lebanese pound gave impetus to agricultural exports and revived the fledgling industry. Nonetheless, the fragmentation of the domestic market, the increased transaction costs on exports as access and trading routes were intercepted and the general destruction of the infrastructure militated against the gains that could have been realised on the more favourable exchange rates.

Nonetheless, the Lebanese people capitalised on their troubles and kept the economy going. When electricity was cut, a number of local entrepreneurs started their own generators, small shops selling all kinds of goods sprang on every corner and many families retreated into their villages and produced their own food. Equally important was the fact that many left the country and emigrated to where jobs could be found. They sent to Lebanon remittances thus reducing the social costs of unemployment. The massive depreciation of the Lebanese pound acted as a shock absorber that moderated and fuelled a countervailing adjustment process. Imports declined, real wages were eroded, debt was depreciated, rents were almost eliminated, barter emerged and Lebanese exports and assets became inexpensive. Meanwhile, the Lebanese Government played a significant balancing role during the war as was discussed earlier.

Although unemployment rates increased, their increase was far below what could have been expected in the circumstances. Evidently, other accommodations were taking place. The war precipitated a reverse rural-urban migration as people fled the cities to the comfort and security of their villages where they grew their own food and bartered their services. The unemployed were re-absorbed into informal sector.

While the precise figures on the outflow of labour during the civil war do not exist, there was ample evidence to suggest that over 260,000 foreign workers left Lebanon between 1974 and 1978 (Khalaf and Rimlinger, 1982) and a slightly larger proportion in the early 1990s. Probably more Lebanese left the country during the same period. This out-migration of labour represented a major adjustment mechanism. They combined to reduce measurably the economic costs of employment losses. In their absence, what was a major economic set back could have been a major economic catastrophe

C. TRANSITION PERIOD (1990-1992)

The framework for a peaceful resolution of the civil war was worked out, in 1989, by the Taif Accord for National Reconciliation, which was negotiated under the auspices of the Arab League. The accord provided a structure for a new political order. Following the actual implementation of the Taif Accord towards the end of 1990, a Government of national unity was reinstated, and a period of economic normalisation and recovery started in Lebanon. However, the economy went through a transition. As was expected, in the immediate post-war period, considerable efforts were exerted on enhancing security, law and order as well as on the restoration of the authority of the central government ther than on economics.

Progress was rather slow and political uncertainty and macroeconomic fragility remained significant; as inflation rate remained high and the Lebanese pound depreciated further. Nevertheless, the Lebanese economy showed remarkable resilience during the transition period and the real GDP achieved a growth rate of 3.5 per cent in 1990 and the growth further accelerated to a significant level of per cent in 1991 and then dropped back to 4.5 per cent in 1992.

However, due to the absence of a coherent and viable economic policy, the Lebanese economy countered some major setbacks in 1992. Social pressures to meet basic needs and failure to put the management of public finances in order adversely affected the country's stabilisation policy and led to a renewed inflation and a sharp depreciation of the Lebanese pound. The economic growth decelerated and inflation increased to 120 per cent. Despite a nominal rise in interest rates, inflationary pressures further eroded the profitability of investments, and rendered the real interest ineffective as it became negative. Moreover, investors confidence was weakened by the abrupt depreciation of the Lebanese pound to its lowest levels against the US dollar.

However, the situation to a large extent was stabilised and improved, after the election of the first post-war parliament and the subsequent appointment of a new Government during the fourth quarter of 1992, which restored confidence in the Lebanese economy. Preparatory work on reconstruction and stabilisation began thereafter.

D. RECONSTRUCTION AND DEVELOPMENT (1993-1998)

It is pertinent to first take stock of the salient features of the Lebanese economy by the end of 1992, before attempting to assess developments during the period 1993-1998.

As indicated earlier, in the pre-civil-war period, the Lebanese Government played a relatively small role in overall economic activities and pursued conservative monetary and fiscal policies. As a result, budget was balanced, revenue made up over 15 per cent of GDP, and Government expenditure comprised 15 per cent of GDP. The relative importance of tax and non-tax revenues was about the same, with indirect taxes dominating tax revenues. While income taxation had long been in use, indirect taxes (mainly custom duties) accounted for most tax revenue. On the expenditure side, the bulk of the spending comprised of wages and salaries paid to Government employees. The outbreak of the civil war resulted in a deterioration of Lebanon's revenue base and a simultaneous rise in expenditures. The consequent deterioration in Lebanon's fiscal position was accommodated by financing from the Central Bank, which fuelled inflation, exchange rate depreciation, and the dollarization of the economy. Furthermore, these developments marginalized the relative contribution of the private sector, while increasing public expenditures widened the Government's role in the economy during and after the civil war. Thus, the advent of the civil war caused a significant deterioration in Lebanon's overall fiscal performance, and, as a percentage of GDP, revenues declined while expenditures rose considerably. Revenues decreased mainly as a result of the breakdown of Government authority over revenue sources.

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Moreover, revenue collection was adversely affected by inflation, which diminished real revenues from specific taxes and induced a shift from taxed to non-taxed activities. As a result, revenues dropped substantially from 15.6 per cent of GDP in 1974 to 1.8 per cent of GDP in 1988 and 6.8 per cent in 1989. Revenue losses during the civil war years were not matched by a corresponding restraint in expenditures because of the Government's efforts to maintain a minimum level of public services and operations. As a result, total expenditures rose from 15 per cent of GDP in 1974 to 19.2 per cent of GDP in 1988 and 39 percent in 1989. In particular, domestic interest payments eventually absorbed a much greater share of total expenditures as the Government increasingly resorted to debt financing of fiscal deficits. In the event, total domestic debt increased significantly during the civil war years and the immediate transitional period that followed.

In short, by end 1992, revenues accounted for 12 percent of nominal GDP against expenditures that constituted 23.4 per cent of GDP leaving a deficit that comprised 11.4 per cent of GDP. The economy grew by 4.5 per cent, while inflation rose to 120 per cent. The end period interest rate for two-year treasury bonds remained at the level of 24.5 per cent during the same year. The exchange rate depreciated significantly during the course of the year and finally stabilised at the end period rate of Lebanese pounds 1838 per one US dollar. Total gross public debt constituted 49 per cent of GDP. A large share of the public debt was domestic and it alone accounted for 44 per cent of GDP. External public debt was relatively less significant and it constituted only 5.0 per cent of GDP.

As such, the size of fiscal deficit and public debt by end 1992 was significant and considered unsustainable requiring serious adjustment. At the same time the government needed to confront the challenging task of reconstruction and the rehabilitation of key infrastructures as well as the restoration of the productive capacity in order to put the economy on the path to a speedy and sustainable recovery. Also, it needed to stabilise the economy and to restore investors confidence to generate the necessary finance for reconstruction and development of the country. From the start it was clear that without a comprehensive fiscal adjustment, the flow of capital investments required to cover the cost of reconstruction and the development of the economy may not be sustainable. In order to sustain macroeconomic stability, it was necessary to curtail inflation, stabilise the exchange rate, and control the budgetary deficit as well as to curb the public debt. Achievements of these goals required coherent, well focused, co-ordinated, properly timed and articulated prioritised consistent policies and programmes the implementation of which would ensure economic stability. Also, there was a need to enhance the role of the private sector in the reconstruction and recovery programs on the one hand and to incorporate the pressing social issues in the policy agenda on the other. Similarly, it was recognised from the onset that in the absence of a swift action to implement a coherent and credible stabilisation program, the confidence of investors in the economy and the pace of recovery would be greatly compromised; and the consequent delay in recovery would in turn exacerbate problems and make the implementation of pertinent economic policies more difficult in the future.

In sum, when the situation relatively became normal towards the end 1992, there were ample reasons for believing that with political stability and the reconstitution of the Lebanese nation, the economy could be turned around and growth could again resume its normal course. There were, however, many obstacles to surmount before the economy could reclaim its health and vigour. First, the basic physical infrastructure that was destroyed during the war must be repaired and rehabilitated quickly and effectively. Second, the inherited rampant inflation should be arrested and the depreciation of the Lebanese pound stopped or slowed down. Third, the profuse and continuous loss of Lebanese talents should seize and the outflow turned around into an influx. Fourth, the Lebanese middle class that was decimated by war and inflation need to be rebuilt. Fifth, the fiscal order should be restored. Sixth, the social and economic imbalances of the past whether those between regions, classes, sects and sectors should be addressed and redressed.

This was a tall order even for a strong Government and a healthy economy. It was doubly so for a fledgling Government and a hampered economy. There was no time to spare and achievements had to be realised quickly and simultaneously. It was clear from the start that serious pitfalls will be encountered in

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repairing a damaged economy and society without a coherent plan and a clear vision of the final outcome of the reconstruction and development.

To this end, the Government of the time embarked on the challenging task of simultaneous economic stabilisation and confidence building on the one hand and post-war reconstruction and development on the other. The Government envisaged a phased strategy for reviving Lebanon's ravaged economy and addressing social problems as well. The strategy consisted of a short- term emergency reconstruction phase followed by a medium-term recovery phase. The government first launched a National Emergency Recovery Program (NERP) to rehabilitate key physical and social infrastructures. This was followed by a more ambitions long-term investment Program -Plan Horizons 2000- aimed at rebuilding and expanding infrastructure to underpin private sector-led recovery leading to a doubling of per capita incomes over ten years. Plan Horizon 2000 envisaged a combination of public and private investments to provide Lebanon with state-of-the-art infrastructure as it enters the next century. It aimed at better sectoral and regional balance and the expansion of key sectoral infrastructures, in addition to a general rehabilitation of infrastructure. As such, Plan Horizon 2000 went beyond the initial emergency work of NERP and included the rehabilitation and expansion of infrastructure and public facilities so as to lay the foundation for future economic growth.

The main aim of the strategy was to enhance growth, development, as well as speedy economic recovery and reconstruction with the least undue economic hardship on the public. In this context, the Government pursued a policy mix comprised of a restrictive monetary and an expansionary fiscal policy aimed at achieving macroeconomic stability, restoring confidence in the economy and generating funds for financing reconstruction and rehabilitation.

Lebanon has made a remarkable recovery from the effects of civil war and strife. With the exception of an area in the southern part of the country that still remains under occupation, the central government authority has been restored all over Lebanon and the country enjoys a stable security condition. Lebanon has regained political as well as economic stability. It has managed to rebuild and upgrade its infrastructure, with remarkable improvements in the provision of basic services and utilities, including water, electricity, telephone, and transport facilities.

The Government's stabilisation and reform measures laid the foundations for a strong economic growth. With the gradual restoration of peace and stability as well as with the initiation of the reconstruction, growth and recovery phase, during the period 1993-1995, the Lebanese economy gained a steady path of real expansion and it attained an annual average growth rate of 7.2 per cent per annum. This high growth was largely driven by construction and high levels of private and public investment. However, due to external shocks and internal fiscal imbalances, this steady high real growth of the economy was not sustained and it started to decelerate from 1996 onwards. During the period 1996-1997 the economy actually grew by 4 per cent and in 1998 the growth decelerated to 3 per cent, Table 3. Actually, sluggish growth in construction activities, and high interest rates crowded out private investment, discouraged borrowing, and slowed down economic activity. Uncertainties on the fiscal and monetary fronts and the expected decline in remittances and direct investments negatively impacted on the growth prospects.

Table 3. Selected Economic Indicators for Lebanon During the period 1992-1998

	1992	1993	1994	1995	1996	1997	1998
Nominal GDP (LL billions)	9,499	13,122	15,305	18,028	20,417	22,880	24,509
Nominal GDP ($ millions)	5,545	7,537	9,110	11,122	12,996	14,867	16,167
Growth Rate of Real GDP (per cent)	4.5	7.0	8.0	6.5	4.0	4.0	3.0
Growth Rate of Nominal GDP (per cent)		38.0	16.6	17.8	13.2	12.1	7.1
Inflation (per cent)	120.0	29.1	8.0	10.6	8.6	7.8	4.0
Overall Balance of Payments ($ millions)	54	1,170	1,131	256	786	420	-487
Exports (LL billions)		785.9	913.3	1,336.2	1,602.9	1,104.4	1,086.7
Imports (LL billions)		3,857.1	4,746.9	8,862.8	11,903.1	11,495.0	10,718.7
Trade Balance (LL billions)		-3,071.2	-3,833.6	-7,526.7	-10,300.3	-10,390.7	-9,631.9
Central Government Revenues (LL billions)	1,138	1,855	2,241	3,033	3,533	3,753	4,430
Central Government Expenditures (LL billions)	2,219	3,017	5,204	5,856	7,225	9,162	7,816
Interest Expenditure (LL billions)	518	784	1,488	1,875	2,653	3,378	3,214
Total Investment (LL billion)		3,870	5,133	6,418	6,734	6,792	6,337
Central Government Overall Deficit (LL billions)	-1,081	-1,162	-2,963	-2,823	-3,692	-5,409	-3,386
Primary Deficit/Surplus (LL billions)	-563	-378	-1,475	-948	-1,039	-2,031	-172
Net Domestic Debt (LL billions)	3,144	4,407	6,712	9,287	13,358	18,381	19,544
Foreign Debt (LL billions)	473	734	1,438	2,126	2,924	3,674	6,188
Total Net Debt (LL billions)	3,617	5,141	8,150	11,413	16,282	22,055	25,732
Gross Domestic Debt (LL billions)	4,178	5,823	9,321	11,997	17,229	19,787	21,686
Total Gross Debt (LL billions)	4,651	6,669	11,007	14,556	20,153	22,461	29,117
Deficit to Expenditure Ratio (per cent)	-48.7	-38.5	-56.9	-48.2	-51.1	-59.0	-43.3
Deficit/Revenues (per cent)	-95.0	-62.6	-132.2	-93.1	-104.5	-144.1	-76.4
Ratio of Interest Expenditures to Revenues (per cent)	45.5	42.3	66.4	61.8	75.1	90.0	72.6
Ratio of Expenditures to Revenues (per cent)	195	163	232	193	205	244	176
Ratio of Revenues to Expenditures (per cent)	51	61	43	52	49	41	57
Ratio of Interest Expenditure to Total Expenditure (per cent)	23.3	26	28.6	32	36.7	36.9	42.4
Exchange Rate LL/$ (annual average)	1713	1741	1680	1621	1571	1539	1516
Exchange Rate LL/$ (end period)	1838	1711	1647	1596	1552	1527	1508
Interest Rate, 2-year TB rate (end of period%)	24.5	22.7	15.3	22.2	19.6	16.1	16.0
Expenditures/GDP (per cent)	23.4	23.0	34.0	32.5	35.4	40.0	31.9
Total Investment/GDP (per cent)		29.5	33.5	35.6	33.0	29.7	25.9
Revenues/GDP (per cent)	12.0	14.1	14.6	16.8	17.3	16.4	18.1
Deficit/GDP (per cent)	-11.4	-8.9	-19.4	-15.7	-18.1	-23.6	-13.8
Export/GDP (per cent)		6.0	6.0	7.4	7.9	4.6	4.4
Import/GDP (per cent)		29.4	31.0	49.2	58.3	50.2	43.7
Trade Balance/GDP (per cent)		-23.4	-25.0	-41.7	-50.4	-45.4	-39.3
Debt Service/GDP (per cent)	5.5	6.0	9.7	10.4	13.0	14.8	13.1
Total Gross Debt/GDP (per cent)	49.0	50.8	71.9	80.7	98.7	98.2	118.8
Total Net Debt/GDP (per cent)	38.1	39.2	53.3	63.3	79.7	96.4	105.0
Foreign Debt/GDP (per cent)	5.0	5.6	9.4	11.8	14.3	16.1	25.2
Net Domestic Debt/GDP (per cent)	33.1	33.6	43.9	51.5	65.4	80.3	79.7
Gross Domestic Debt/GDP (per cent)	44.0	44.4	60.9	66.5	84.4	86.5	88.5
Net Foreign Exchange Reserves ($ millions)	1,162	1,460	2,751	3,026	3,935	2,959	3,318
Gross Foreign Exchange Reserves ($ millions)	1,448	2,220	3,840	4,487	5,826	5,932	6,274

Source: Ministry of Finance & Central Bank of Lebanon

Realising the crucial importance of stable financial and monetary conditions as the foundation for a speedy economic revival, the Lebanese government has worked effectively towards stabilising the national currency and containing inflation. The restrictive monetary policy persuade in this regard aimed at controlling money supply, stabilising the Lebanese pound, and gradually reducing interest rates to promote investment and stimulate growth, thus creating an environment more conductive to investment and capital inflows.

As a result of a prudent monetary policy, anchoring the Lebanese pound to US dollar, the pound appreciated by 22 per cent between 1992-1998 from LBP 1838 in 1992 to LBP 1508 in 1998 against one US dollar, Table 3. This appreciation may not be sustainable if the budget and the trade balance deficit continue to increase.

Movements in the exchange rate of the Lebanese pound are linked with domestic price developments because of the openness of the Lebanese economy. Since the mid-1980s, Lebanon has suffered from rapid increases in prices, peaking at 500 per cent in 1987. This trend was significantly reversed by the Government and inflation has been brought down markedly and has stabilised. Inflation has been successfully reduced from 120 per cent in 1992 to a low level of 4 per cent in 1998. The low levels of inflation and the stability and gradual appreciation of the Lebanese pound were accomplished despite fiscal deficits. Various factors contributed to this success, most significantly the implementation of a restrictive monetary policy including a stable exchange rate and high interest rates, along with maintaining the openness of the economy that caused excess demand on the domestic market to be satisfied by a corresponding

increase in imports. Increased competition, greater openness of the market and the elimination of supply bottlenecks and economic rigidities were also instrumental.

Foreign exchange reserves have been replenished, with gross reserves (excluding gold) at the Central Bank rising from around $ 1448 million in 1992 to $ 6274 million in 1998, while net foreign exchange reserves rose from $1162 million to $3318 million during the same period. This relatively high level of reserves has been warranted in view of the openness of the economy and the potential volatility of capital flows in the absence of current and capital payment restrictions. It was actually the policy of high interest rates that enabled a steady appreciation of the Lebanese pound and reduced inflation to a tolerable level. The exchange rate based nominal anchor policy was implemented by means of a supportive interest rate policy. High interest rates also encouraged attracting large capital inflows, which together with foreign investment into the real estate sector and financing for the reconstruction program, more than financed the external current account deficits and led to a sharp increase in foreign exchange reserves. Generally, Lebanon managed in the past to sustain balance of payments surplus by the continuous flow of remittances and capital inflows. The balance of payments has shown solid recovery since the end of the civil war and this strength of the balance of payments is considered to be one of the positive features of the Lebanese economy. Lebanon has managed to attract short-term capital inflow due to high interest rate on Lebanese pound placements and a continuous improvement in the country's macroeconomic performance. Favourable macroeconomic and financial developments were accompanied by structural improvements. A significant part of the infrastructure has been restored; the private sector has been getting more involved in reconstruction including through build-operate-transfer schemes; the financial sector has been deepened and widened, its supervision and capital base have been strengthened; and the budget process and administration have been streamlined and modernised, and revenue administration has been strengthened. Furthermore, the government and the private sector were able to tap effectively international capital markets. Moreover, the mobilisation of external financing has eased interest costs on the budget and allowed for lengthening the maturity structure of public debt. Structural improvements in the economy increased productivity and helped compensate for the effects of the real effective exchange rate appreciation on competitiveness, which is more limited in Lebanon than in other countries given the highly dollarized nature of the economy.

Lebanon also took practical steps in concluding a number of bilateral agreements within the context of the Arab common market agreement on free trade areas with a number of countries during the period 1996-1998. Lebanon signed a free trade agreement with Syria, and it came into effect on 1 January 1999. According to this agreement custom duties will be reduced annually by 25 per cent over a period of four years. The agreement for the time being excluded agriculture because of concerns of Lebanon. The agreement is seen as a first step towards creating an Arab Free Trade Area and catching up with the age of globalisation, including the Euro-Mediterranean partnership.

Lebanon also signed an agreement with Kuwait in September 1998 regarding the abolition of custom duties on all industrial products within a period of four years. The agreement, which took effect on 1 January 1999, immediately abolished taxes on 58 Kuwaiti industrial products and 128 Lebanese industrial products.

A similar agreement was signed with Egypt to come into effect on 1 January 1999. Likewise, an agreement was signed with Jordan concerning the free trade of selected agricultural products according to a set mutual agricultural calendar.

Lebanon was also admitted in the capacity of an observer to the World Trade Organisation (WTO) in December 1998. Liberalisation of trade within the framework of WTO could provide a better platform for optimising the country's comparative advantages and competitiveness rather than bilateral agreements. WTO membership necessitates fulfilling of the legal conditions along with standards of international agreements and putting in place a strategy to participate in negotiations involving government and trade and productive sectors.

Negotiations on joining the Euro-Mediterranean partnership are still in progress and not yet concluded. The implication of the above agreement on agriculture is not yet fully assessed. In this context Lebanon will need more resources and assistance to upgrade and sustain the development of the productive sectors.

In sum, during the 1993-1998 period Lebanon managed to stabilise and appreciate the exchange rate of the Lebanese pound versus the United States dollar, gradually reduce the interest rates, and significantly decrease the level of inflation. And the real GDP in total increased by 32.5 per cent between 1992 and 1998, increasing from Lebanese pound 9499 billion to Lebanese pound 24,509 billion, Table 3. Foreign exchange reserves increased from dollar 1,448 million in 1992 to dollar 6,274 million in 1998. The decline in inflation, the stable exchange rate, and the building of foreign exchange reserves increased credibility in financial markets and raised the demand for Lebanese pounds and reduced dollarization. The government and the private entities were able to successfully issue foreign currency bonds in international capital markets. Lebanon witnessed an economic revival led by an active private sector supported by a pragmatic monetary stabilisation policy.

Nonetheless, the incompatible demands of reconstruction and economic stabilization requirements have proven to be more formidable than originally perceived.

Lebanon is primarily an importing country and as a consequence, the country had run large trade deficits. Nevertheless, net foreign income earnings, remittances and earnings from tourism, insurance, banking as well as other services counterbalanced the trade deficits.

Imports along with consequent trade deficits have risen considerably during the last few years owing to the construction and the surge in demand for construction materials. Substantial capital inflows and continuing remittances financed these deficits and resulted in a balance of payments surplus. It is worth noting that even during the civil conflict, the balance of payments was generally in surplus. The balance of payments temporarily deteriorated for a while in 1995 but remained in surplus by the close of the year due to renewed confidence and the large capital inflows. Nonetheless, the balance of payments recorded a deficit of $ 487 million for the year 1998. It is widely believed that this deficit was in a large part due to turbulences in certain financial markets in 1998 and to a consequent withdrawal of funds by foreign investors in Lebanese treasury bonds as part of an overall reduction of exposure to emerging markets.

Lebanon has always suffered from successive trade deficits, owing mainly to a heavy reliance on imports and a weak export base. Since the end of the civil war, trading patterns worsened owing to rising imports of consumer goods as well as capital and intermediate goods required for reconstruction, coupled by insufficient increases in merchandise exports. As a result, the trade deficit widened significantly during the period 1992 - 1997, before it narrowed down in 1998, Table 3. It is worth mentioning that trade deficit as a percentage of GDP also deceased in 1998. This development was the result of a surge in exports combined with a lower growth in imports. Considering that the scale of the trade deficit is not in itself alarming, merchandise imports have been rising at a much higher rate than that of exports, resulting in large trade deficits over the years. Merchandise export continued to sustain steady growth during the period 1993 – 1996, but then it declined in 1997 and 1998, due to the institution of protective measures. Moreover, the appreciating Lebanese pound and the high input costs relative to regional competitors constrain the steady expansion of the export sector in Lebanon.

As the trade deficit expanded, the government made greater efforts to stem the flow of imports by increasing custom duties. Similarly, an effort was made in 1997 to cut the food bill by banning the import of some agricultural goods altogether, while in other cases limiting them at certain times of the year to protect local agriculture. In 1998, food products continued to account for the largest single group of imports at a little over 20 per cent of the total. Meanwhile, food products, mainly fresh fruits and vegetables, and their derivatives, continued to account for the largest share of exports. Stiff competition against lower cost producers like Syria, Egypt and Turkey, has seen Lebanese agricultural exports suffer heavily over the last few years.

Most Lebanese exports go to other Arab countries mainly Saudi Arabia, the United Arab Emirates (UAE), Syria and Kuwait, and Jordan while most of the rest go to the European Union, and the United States, Table 4. On the other hand, Europe and North America have traditionally supplied the bulk of Lebanon's imports, accounting for an estimated 68.8 per cent in 1998, Table 5. Italy and France have traditionally been the main sources of imports, but the United States, Germany and Switzerland have also increased their market share in Lebanon in recent years.

The national strategy of recent years continued to be predominantly tilted to sustain and reinforce monetary stability, to reconstruct and develop the physical infrastructure, to empower the private sector and to guide the re-emergence and development of Lebanon as a regional centre. This policy put the country on the course to reclaim its place on the regional and international arena. However, the economic and recovery policies imposed a massive price as there continued to be a strong reliance on domestic resources to finance the reconstruction program, thus causing immense public deficits and accentuating public debt. Similarly, social considerations were largely kept at a distance. Consequences of this situation were the considerable difficulties experienced in the reactivation of the economy, particularly the productive sectors, on the one hand, and the increasing evidence about disparities and distortions on the other. Benefits from the reconstruction activity-mainly confined to public infrastructure and services and economic growth did not trickle down to the majority of the population. The lack of balanced regional development is still a subject of controversy and deliberation among civil society and government authorities who had since taken initial measures to step up public investment in under-served areas and to develop public services at the level of the local economy.

The Government's significant contribution to the reconstruction effort has been the rebuilding of the infrastructure and provision of regular public services. However, a number of factors such as the acceleration in the growth of government capital expenditure, the large and expanding current expenditure and the slow recovery of the revenue-generation capacity have led to sizeable fiscal imbalances.

The deficit fell from 11.4 percent of GDP in 1992 to 8.9 percent in 1993; however, it rose and remained high thereafter up until 1997 where it reached 23.6 per cent of GDP. In 1998, in order to ease strains on the overall macroeconomic policy mix and reduce the vulnerability of the budget to changes in financial market sentiment, efforts were made to turn around the fiscal situation and stabilise the debt dynamics and as a result deficit fell to 13.8 per cent of GDP. The deficits have been financed mostly through the issuance of Government papers, with maturities of up to two years, denominated in Lebanese pounds and held primarily by the domestic banking system. Consequently, the public debt increased rapidly. In fact, during the period 1993–98, total gross public debt as a percent of GDP rose from 50.8 percent to 118.8 percent, and total net public debt increased from 39.2 percent to 105 percent of GDP during the same period.

Table 4. Destination of Exports [1]

	1993	1994	1995	1996	1997	1998
	(as percentage of total)					
Industrial Countries	**23.4**	**14.3**	**21.3**	**22.3**	**32.9**	**36.9**
Italy	0.8	0.5	1.5	3.8	3.3	2.6
United States	4.7	0.3	3.7	3.0	6.0	6.6
Switzerland	0.5	2.8	1.1	1.5	2.4	3.4
France	5.4	3.2	6.0	4.6	7.2	8.7
Germany	1.6	1.3	2.2	2.3	2.2	3.2
United Kingdom	3.3	0.3	1.7	1.6	3.1	3.0
Other	7.1	6.0	5.1	5.5	8.7	9.4
Developing Countries	**76.6**	**85.7**	**78.7**	**77.7**	**67.1**	**63.0**
Middle East	48.3	71.0	59.7	62.4	54.1	43.4
Saudi Arabia	13.6	18.0	11.0	13.7	15.1	12.1
Syria	10.3	15.6	8.4	6.9	5.9	6.5
Jordan	5.5	9.2	4.0	4.9	3.9	3.6
Kuwait	5.6	8.0	3.9	7.7	4.5	4.2
U.A.E.	8.2	16.3	28.8	23.4	9.0	9.9
Egypt	2.9	0.5	1.9	1.7	2.5	2.4
Other	2.2	3.4	1.7	4.2	13.2	4.6
Africa	9.2	3.7	5.3	3.4	4.8	5.0
Other Europe	16.3	8.9	8.2	4.1	1.2	6.0
Other	2.8	2.1	5.5	8.0	7.0	8.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Higher Council of Customs and the Central Bank of Lebanon
[1] Minor discrepancies in the figures appearing in this table are due to rounding

The level of the debt is increased by the yearly deficits on the Government budget. These deficits are of two kinds—a primary deficit that reflects the difference between program expenditures and Government revenues and a secondary deficit that represents interest and other payments on the debt. The primary deficit in Lebanon was rather low and is expected to even turn into a positive (surplus) value in 1999. The difficulties arise from the debt service payments. These are too large. They increased from a low of LL 518 billion in 1992 to LL 3214 billion in 1998. Their level is determined by the size of the debt and also by the interest payments made on it. Unfortunately, the high interest paid on both the domestic and foreign components of the debt is responsible for the high deficit that raises the debt. It is hard to break away from this vicious cycle without higher economic growth, higher Government revenues and lower interest payments. Not surprisingly lower interest rates and higher economic growth are also highly correlated (and possibly the former is a cause of the latter).

Table 5. Sources of Imports [1]

	1993	1994	1995	1996	1997	1998
	(as percentage of total)					
Industrial Countries	63.9	65.6	65.8	69.1	68.2	66.8
Italy	12.7	13.5	13.0	12.1	13.2	11.5
France	8.6	9.0	7.5	7.8	9.5	9.7
Germany	9.3	10.1	8.4	8.5	8.7	8.7
United States	10.6	9.3	10.5	10.9	9.2	9.3
Japan	3.9	4.3	4.0	3.9	4.1	4.2
United Kingdom	4.4	4.2	3.9	4.0	4.4	4.5
Switzerland	3.4	3.5	4.7	3.4	6.6	6.3
Belgium-Luxembourg	1.8	1.8	1.9	1.5	1.9	1.9
Other	9.2	10.0	12.0	17.0	10.6	10.7
Developing Countries	36.1	34.4	34.2	30.9	31.8	33.1
Middle East	9.6	7.8	7.5	8.3	9.4	8.7
Saudi Arabia	1.4	1.4	1.8	1.5	1.7	1.7
Syria	5.0	4.4	3.4	4.1	4.4	3.7
Bahrain	0.0	0.0	0.0	0.1	0.1	0.1
Kuwait	0.2	0.1	0.1	0.1	0.1	0.1
Other	2.9	1.9	2.1	2.6	3.2	3.1
Africa	2.8	2.5	2.2	1.0	0.8	0.5
Europe	13.6	13.5	12.5	8.5	5.3	5.5
Romania	1.5	1.6	0.9	0.8	0.6	0.5
Turkey	1.6	2.2	2.1	2.3	2.1	2.5
Cyprus	0.4	0.4	0.4	0.4	0.5	0.2
Other	10.1	9.4	9.1	5.1	2.1	2.2
Others	10.1	10.6	12.1	13.1	16.3	18.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Higher Council of Customs and the Central Bank of Lebanon
[1] Minor discrepancies in the figures appearing in this table are due to rounding

While borrowing was a necessary option, the terms at which the borrowing was made were high (for the foreign component of the debt, about 250-350 basis points above comparable borrowing rates of the US Government) and the maturity period was relatively short. This is true for both the domestic and the foreign components. Taking into account a reasonable risk premium Lebanon borrowed at rates that were significantly higher than the prevailing rates on dollar accounts. Similarly, with the Lebanese Pound exchange value fixed in terms of the US dollar (actually it even appreciated in value), the double digit rates paid on the Lebanese Pound denominated treasury bills and bonds exceeded by far the opportunity returns on comparable dollar accounts. These rates have already become a significant burden on the economy. The higher interest rates that were needed to stabilise the foreign exchange value of the Lebanese Pound so as to play the role of a financial anchor for reducing inflation have driven a wedge between fiscal policy and monetary policy, distorted investment, and compromised production. Higher interest rates were required to attract foreign capital, sustain constrained domestic liquidity, finance the Government deficits and stabilise the foreign exchange value of the Lebanese Pound. But they also increased the deficits, the borrowing requirements of the Government, the diversion of liquidity towards Government bills and bonds and away from trade and investment credits and appreciated the Lebanese Pound far above its true equilibrium value. In the process, they constrained investment, domestic production and exports. Perhaps worse, the brunt of economic adjustment is now borne exclusively by output and employment (quantity adjustments versus what could have been a price-quantity adjustment process). As is clear from Table 3, annual GDP real rates of

growth fell from 7 percent in 1993 to 3% in 1998.

With the nominal exchange rate anchor policy, the large financing needs of the Government involved high and flexible interest rates. Notwithstanding recent declines in nominal interest rates, the cost of servicing the growing stock of debt has been high and increasing: interest payments absorbed 90 percent of total budgetary revenues in 1997. Moreover, high interest rates have adversely affected private sector activity.

After the war, the return to less trying conditions took place in the context of marked divergence between current and anticipated future income streams, accompanied by domestic demand in excess of current capacity. The natural result of this divergence has been borrowing against future income as well as dissaving. Borrowing occurred not only by the government as discussed above, but also by firms. Meanwhile, dissavings and transfers (external assets) have been prevalent at the household's level. Reflecting these saving-investment imbalances, large trade and external current account deficits accompanied reconstruction and the post-war normalisation of economic activity.

The macroeconomic stabilisation program of the Government has produced some major successes and some critical problems. The inflation rate declined from 120% per year in 1992 to 7.8% in 1997 and to even a low level of 3% in 1998. The Lebanese Pound reversed its downward slide and real growth in GDP in 1992-1995 was solid and significant. However, this success came at a high price. The investment to GDP ratio has declined despite the massive reconstruction effort (from 35.6 % in 1995 to 25.9% in 1998). Unemployment is still high. The official estimates of 8.5% grossly underestimate the real magnitudes of this problem that is believed to exceed 30%. A large number of apartments in Beirut and surrounding areas are empty and unsold with potential adverse effects on the entire banking system. Growth has slowed measurably. Real GDP growth rates have slumped from 8% in 1994 to 3% in 1998 (Table 3). Exports are a fraction of imports (10%). The surplus on the balance of payments is dwindling fast. The deficit continues to rise, debt servicing absorbs almost all of the government revenues and the foreign component of this debt requires a servicing charge that is larger than total export proceeds. Debt has already surpassed the red line of 100% of GDP (see Table 3). The Government revenue elasticity is below one (the percentage change in Government revenues divided by the percentage change in GDP between 1996 and 1997 was 0.4, suggesting that Government revenues grow less than the GDP). Over 61% of all deposits in the Lebanese banking system and over 88% of its loans are in US dollars. (Nicholas Sarkis, Assafir, September 8, 1998).

There is a need to lower the interest rate for investment purposes and more funds should be made available for productive investment in agriculture and industry and for export promotion. The interest rate is at least four to five percentage points above other alternative borrowing rates. Furthermore, the Lebanese Pound is about 22% above its market value. Now that inflation has been snuffed, it is perhaps advisable to lower the nominal interest rates to levels consistent with the old real rates before the decline in the inflation rates. This will encourage investment and will reduce the debt service charges (every one percent reduction in interest rates reduces debt servicing payments significantly). The latter may restore coherence to the policy mix (fiscal and monetary policy co-ordination). The two policies are currently inconsistent—high interest rates raise the deficit, increase the debt and raise in turn the interest rate. There is a definite need for re-alignment and synchronisation between the two planks of public policy. The interest rate adjustment, if used judiciously, can also bring down, in an orderly manner, the exchange rate to a level that is more consistent with export promotion without causing a major collapse of the foreign exchange market.

The difficulties and challenges posed by large deficits, huge debts, declining growth, over-valued Lebanese Pound, high unemployment, widespread poverty, regional and sectoral imbalances are still formidable. There is a need to create a favourable economic environment for business and growth, provide sufficient inputs that raise the productivity of the economy and meet the basic needs of citizens, moderate and temper extreme distributional outcomes of the market and provide an affordable social safety net.

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There are a number of measures that can be taken to change and improve the economic and social situation in the country. It is difficult to list them all; the short list below is presented without due regard to the priority or sequential logic of these measures.

A serious macroeconomic stabilisation effort should target reducing the deficit at once. This can be best achieved by reducing the interest rate by at least 200-400 basis points, renegotiating the maturity terms of the debt, and raising more revenue from progressive taxes on income and wealth and from expenditure taxes that involve high offsets or credits to lower income earners

Raising more revenues without fostering growth is unsustainable. Growth can be fostered through the granting of optimal subsidies (tying the subsidy or the soft term of the loan to production and export performance indices). credit expansion towards productive uses, and a more export oriented value of the exchange rate.

The problem of unemployment has yet to receive full attention. Growth with emphasis on employment creation can be achieved through a well-designed employment creation program that can be worked out with the private sector. This policy should be tied to the strategy of fostering growth; the two cannot be separated.

Lebanese comparative advantage has always been its people, great geographical beauty, relative water abundance, climatic and ecological diversity and ingenuity. Building on strength requires developing agribusiness that utilises wisely and efficiently the water relative advantage in the region, integrate the deprived southern and eastern regions in the development program, and opening again the traditional export markets

To ensure the sustainability of successful reconstruction and the stabilisation of the economy and enhancing the framework for a path of rapid and balanced growth, fiscal consolidation remains the most urgent policy issue in view of the debt dynamics and the need to crowd in private sector activity. This would involve an early reduction in the deficit and a generation of surpluses in the primary balance in the coming years as well as improvements in the structure of the budget, especially through reducing the dependency on customs revenues.

A number of contributing factors including the early introduction of a general sales tax, cost-recovery measures related to public infrastructure services, and continued efforts in strengthening tax administration would facilitate an early fiscal adjustment and the improvements in the structure of the budget. In addition to a stable macroeconomic environment and low production costs, institutions and regulatory reforms are needed to create an enabling environment for private-sector-led high growth over the medium term. High private-sector-led growth should increase employment opportunities and alleviate poverty. However, in order to enhance the socio-political acceptability of the medium-term adjustment and the reform process, there is a need to address disparities in income distribution and regional socio-economic differentials.

E. POLICY SHIFT AND FIVE-YEAR FISCAL REFORM PLAN: 1999-2003

The Lebanese authorities are cognizant of the challenges facing the economy in an environment of globalized financial markets. They also recognize that determined implementation of fiscal adjustment and reforms holds the promise of economic stability and high growth in Lebanon, providing for increased for employment opportunities and higher standards of living.

The expansionary fiscal policy of the past few years has led to unsustainable levels of budget deficit and rapidly increasing public debt. This situation warranted a policy shift in Lebanon and called for concerted efforts to carefully approach the challenging task of reversing this trend. To this end, the government is determined to reduce current expenditures but not at the expense of productive sectors, on the contrary, it is intending to increase investment allocations to productive sectors such as agriculture and industry.

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-    The Government is also intending to introduce a modern economic and financial system that will ensure high rates of economic growth which will in turn improve the standards of living. It further envisages to improve the efficiency of the management of the budget system by containing expenditures, improving collection of revenues, and modernizing the tax system thereby decreasing the budget deficit and the level of public debt. These fiscal reforms will be accompanied by monetary stability embodied by a stable exchange rate and a low rate of inflation.

Nevertheless, it has been recognized that in order to reverse this trend a number of pertinent actions are required which will span over a number of years. To this end, the government is intending to improve the fiscal situation within the framework of a five-year fiscal reform plan, to be accompanied by a recovery plan comprising an investment programme that would reactivate and reinvigorate the economy and the productive sectors.

The five-year fiscal reform plan focuses on economic and fiscal objectives and on the intended adjustment to be achieved during the next five years with respect to different indicators. It also elaborates on different policy initiatives and measures envisaged to achieve the plan targets. In terms of broader economic policy, the plan specifies the direction to be taken and the actions required.

The five-year fiscal reform plan is comprised of major fiscal adjustments and treasury measures aiming at a sustained decline of budget deficits and at curbing the debt-to-GDP ratio. The plan envisages to reduce the ratio of the budget deficit-to-GDP to around five per cent by the year 2003. Likewise, debt-to-GDP ratio is expected to fall to 96 per cent by the year 2003.

The major strategies for achieving the broad targets of the five-year fiscal reform plan are detailed below:

1.   Modernizing and adjusting the tax system: Within this strategy, priority is awarded to the introduction of a VAT and the application of a global income tax. In addition, the Ministry of Finance will continue to reinforce its audit and collection records along with a simplification of tax procedures.

2.   Privatizing public entities and increasing the role of the private sector in the economy through awarding some infrastructure projects to the private sector. It is important to note that proceeds from privatization will be used to write off public debt.

3.   Reducing public expenditures and reorganizing the public sector: This strategy relies on the reconsideration of the role of the public sector through administrative reform and will ultimately result in a rationalization of expenditures.

4.   Restructuring public debt and improving its management through establishing a debt management unit at the Ministry of Finance.

The five year fiscal reform plan is the first step in the right direction; however, at the implementation stage there is a need to elaborate further on priorities and specify concrete actions. There is no doubt that the five-year targets, if achieved, will have a positive impact on the sustainability of economic growth.

The preparation of the 1999 budget provided the first opportunity to introduce a policy shift and to lay the foundation for an expanded set of measures to be taken within the framework of the five-year fiscal reform plan. As such, the Budget 1999 constitutes the first cornerstone of the five-year fiscal reform plan. The Budget 1999 estimates an overall deficit of LL 3,370 billion with total expenditure appropriations amounting to LL 8,360 billion and total revenues reaching LL 4,990 billion. This target is in line with the government's overall strategy of containing public expenditures and reducing the overall deficit and also constitutes the first step towards meeting the objectives of the five-year fiscal (adjustment program) reform plan. The deficit to expenditure ratio is projected at 40% (a 4 per centage point improvement as compared to 1998 deficit of 44%) and the primary balance will register a surplus of LL 530 billion.

One of the main objectives pursued by the government for the preparation of the Budget 1999 was to contain expenditures. Despite little room for maneuvering, due to large debt service, wages and salary bills, it is envisaged to curtail current expenditures without affecting capital and project expenditures. In fact, capital expenditures represent 10 per cent of 1999 budgeted expenditures as compared to 7.5 per cent for the 1998 budgeted expenditures.

In order to enhance revenues for the Budget 1999, the government is pursuing on going efforts to invigorate revenue collection and to further widen the taxpayer base. It also foresees new revenue sources that constitute the first step toward achieving a comprehensive tax reform (increasing rates of income and corporate taxes and custom duties). Moreover, Budget 1999 includes some tax incentives intended to encourage investment and private sector initiative in certain productive sectors.

The budget 1999 targets appear to be inline with anticipated fiscal reforms and represent a first step on the road to public finance adjustment. The budget itself is a comprehensive programme incorporating a wide spectrum of revenue measures levied on different economic agents – consumers, investors and business – in addition to austerity in public spending. This combination of revenue and expenditure targets puts the budget deficit for 1999 roughly at 13 per cent of GDP, still high by regional and emerging market standards. The government success to a large extent will depend on how carefully and effectively it will launch a comprehensive privatization programme, including a detailed timetable and structured implementation plan, as part of an overall macroeconomic policy mix incorporating resource mobilization, and administrative and fiscal reforms.

Fiscal adjustment to a large extent will also rest on a combination of measures related to both treasury and tax administration. The successful realization of these measures could provide a positive market environment allowing monetary authorities to ease monetary policy, decrease interest rates, and thus secure savings in the most important component of its budget, which is debt servicing. Each one percentage decline in interest rates will generate a significant decline in debt servicing and a substantial drop in the public deficit o expenditure ratio. In addition to that, the decline in interest rates will release funds for investment in productive sectors such as agriculture and industry. In this context, the stabilization of the local currency and its gradual depreciation to an equilibrium level will also provide additional incentives for the expansion of ie productive sectors as well as external trade particularly the export component. Fiscal convergence can be chieved by the combination of prudent fiscal measures within the framework of an accommodating monetary policy as well as a higher real economic growth. Within the framework of a growth-oriented iacroeconomic policy mix accompanied by successful implementation of privatization, fiscal reforms, and rudent debt management a better prospect for a prosperous economy could be secured.

IV. REVIEW OF THE AGRICULTURAL SECTOR

The civil war in Lebanon provided a natural laboratory for defining the importance and the contribution of the agricultural sector to the economy under special circumstances that allowed for a more realistic exchange rate, a reverse migration from urban to rural areas and a greater need to satisfy local demand for agricultural products from local sources. As it is clear from Table 6, the agricultural sector contributed between 15% and 23% of GDP between 1985 and 1990. In more than one sense, the agricultural sector played the role of a "swing producer" that made up for the emergent slack in the economy. However, the relative contribution of agriculture to GDP declined back to its pre-war level after 1991.

All through the modern history of Lebanon, the agricultural sector was a net importing sector. During the war and in the pre-war years agricultural exports represented a larger share of total exports amounting to 30% as compared to the years after the war where this share dropped to even below 20% (Table 7). This 20% share in the post civil war years was preserved despite the fact that total exports increased substantially in absolute value between 1992 and 1998. Agricultural imports have risen faster than agricultural exports resulting in a major decline in the ratio of agricultural exports to agricultural imports from 19% in 1994 to 9.9% in 1998 (Table 7). As a consequence, Lebanon developed a large and increasing deficit on its balance of trade in agricultural commodities. In 1993, the agricultural trade deficit stood at LBP 635,892 million and by 1998 it increased to LBP 1,953,802 million. The widening gap in the trade balance is inextricably linked to the appreciation in the exchange rate of the Lebanese pound vis-à-vis the US dollar, the increase in domestic income following the war and during the massive reconstruction period, and on account of the high inflation rate at the time. Actually, the Lebanese exchange rate declined (appreciated) from LL1,838 to the dollar in 1992 to LL1,508 in 1998. Estimates of the responsiveness (elasticity) of both of the demands for exports and imports show that they are both elastic with respect to exchange rate changes and therefore can partly explain the rise in imports and the decline in agricultural exports.

Most of Lebanon's exports of agricultural products are destined to neighboring Arab countries (Table 8). Saudi Arabia and Kuwait were the two major importers in 1998. Saudi Arabia alone cleared about 41.56% of the total Lebanese agricultural exports in 1998. Syria, Jordan, UAE, Egypt and Bahrain are also major export markets for Lebanese agricultural products.

Lebanon generally exports apples, potatoes, tomatoes, onions, garlic, banana, grapes, apricots, cherries and citrus fruits.[2]

On the other hand Lebanon imports grains, dairy products, meat and fish primarily from the United States, Syria and the European Union.[3]

The macroeconomic environment within which the Lebanese agricultural sector had to function and develop was characterized by high interest rates, deficient physical infrastructure, frequent interruptions in electricity, weak government institutional support, strong preference for urban development, and at the beginning of the reconstruction period, some very high levels of inflation.

By way of providing a synopsis of the agricultural sector and the typology of its structure, we provide below a brief discussion of the availability and distribution of cultivated land by type of irrigation and political region (Mohafaza and Caza), the total and composition of livestock and crop production. The presentation is concise but it is intended to provide a background to the discussion of the policy issues and challenges that constrain the current development of the sector and can influence its potential development in the future.

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2.   A. Baalbaki and F. Mahfouz, *"The Agricultural Sector in Lebanon: Major Changes During the Civil War"*. (Beirut: Dar Al Farabi, 1985).

3.   T. Jaber, *"The Agricultural Sector in Lebanon: Analysis and prospects"*. (Beirut, Lebanese Policy Centre, 1997), PP.19-48.

Table 9. Time Series Data on Total and Agricultural Gross Domestic Product

Year	Total GDP in current prices in LL bn	Agriculture GDP in current prices in LL bn	Percentage share of agriculture in total GDP
1964	3,200	0,381	11.9
1972	6,365	0,631	9.9
1973	7,103	0,664	9.4
1974	-	-	9
1977	8,200	0,700	8.5
1985	-	-	15
1988	-	-	20
1990	-	-	23
1991	-	-	19
1994	15,305	1,807	12.0
1995	18,028	2,237	12.4
1996	20,417	2,045	10*
1997	22,880	2,772	12*
1998	24,509	2,826	12*

Source: Central Administration of Statistics, Central Bank of Lebanon and Ministry of Agriculture
*Years 1996, 1997 and 1998 figures are estimated

Table 7: Times Series Data on Total and Agricultural Exports and Imports
(in LBP million)

Year	Total Exports	Total Imports	Total Agricultural Exports	Agricultural exports as % of total exports	Total Agricultural Imports	Agricultural imports as % of total Imports	Agricultural trade deficit	Ratio of agricultural exports to agricultural imports %
1994	913,318	4,746,902	182,487	19.98	953,154	19.89	-770,667	19.15
1995	1,336,151	8,862,829	232,083	17.37	2,244,456	19.02	-2,012,373	10.34
1996	1,602,852	11,903,104	251,349	15.68	2,360,305	19.85	-2,108,956	10.65
1997	1,104,373	11,495,044	221,231	17.09	2,310,592	19.85	-2,089,361	9.57
1998	1,086,738	10,718,660	215,077	19.77	2,168,879	20.21	-1,953,802	9.92

Source: Customs Administration

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Table 8. Share of fruits and vegetables exportation by country

DESIGNATION Per country	1998 Jan.	Feb.	March	April	May	June	July	Aug.	Sept	Oct	Nov	Dec	Total	% Share
Saudi Arabia	7288	5571	5773	6464	5573	4799	4335	4558	5179	5649	6704	8571	70464	41.56
Dubai	2846	1343	2737	818	690	705	1276	615	760	984	1304	2206	16284	9.60
Kuwait	2184	1725	4629	2812	2732	1692	2476	1927	1865	2172	2006	1604	27824	16.41
Egypt	979	1027	128	77	35	67	42	-	562	840	789	708	5254	3.10
Jordan	167	9924	2055	5195	208	-	-	69	260	1603	1291	527	21299	12.56
Bahrien	358	381	518	668	363	376	64	324	416	583	401	669	5121	3.02
Libia	723	2816	232	2877	-	-	-	-	5	499	-	-	7152	4.22
Qatar	516	414	185	479	406	227	142	318	391	410	334	644	4466	2.63
Other Arab countries	1026	591	439	1714	937	520	175	567	585	635	998	3230	11417	6.73
Other countries	57	17	5	3	3	25	9	6	18	49	48	19	259	0.15
Total (fruits)	16144	23809	16701	21107	10947	8411	8519	8384	10041	13424	13875	18178	169540	100.00
Saudi Arabia	146	16	-	26	500	1589	3900	11012	17800	11022	3763	60	49834	42.91
Dubai	108	-	1	153	2086	1925	3469	3360	3734	3253	4525	470	23084	19.88
Kuwait	510	38	38	255	1312	1833	4319	3517	2505	2549	2096	693	19665	16.93
Other Arab coubtries	45	-	5	241	1567	839	1140	4394	8247	5079	1537	361	23455	20.20
Other countries	2	-	4	2	3	21	11	6	19	12	6	5	91	0.08
Total (vegetables)	811	54	48	677	5468	6207	12839	22289	32305	21915	11927	1589	116129	100.00

Source: Ministry of Agriculture

Lebanon is administratively divided into six regions or Mohafazats. Each Mohafaza is further divided into smaller districts known as Cazas. It is estimated that 35% of the total land of Lebanon is cultivable, but only 60% of this potential is used. The total cultivated area is estimated to approximate 296,554 ha, of which about 60% is rainfed, about 39% is irrigated and less than 1% is under greenhouses (Table 9). In addition, there are over 119,774 ha of forests and 527,790 ha of pastures. The largest agricultural region is in the Bekaa and it represents almost 38% of the total cultivated land, followed by North Lebanon with 33% (Figure 1). The pattern of agricultural land use differs from one Mohafaza to another. There are almost no greenhouses in the Bekaa or Nabatiyeh. The largest share of Greenhouses is in Mount Lebanon and North Lebanon. Rainfed agriculture dominates irrigated agriculture in most of the Mohafazats; this dominance is, however, marginal with the exception of Nabatiyeh (Figure 2). The pattern of agriculture and irrigation types are presented by Caza in Table 10. It is quite revealing that in many parts (Cazas) of Mount Lebanon, irrigated agriculture supersedes rainfed agriculture. This is not true for the rest of the Mohafazats.

Figure 1
Total Cultivated Land by Region
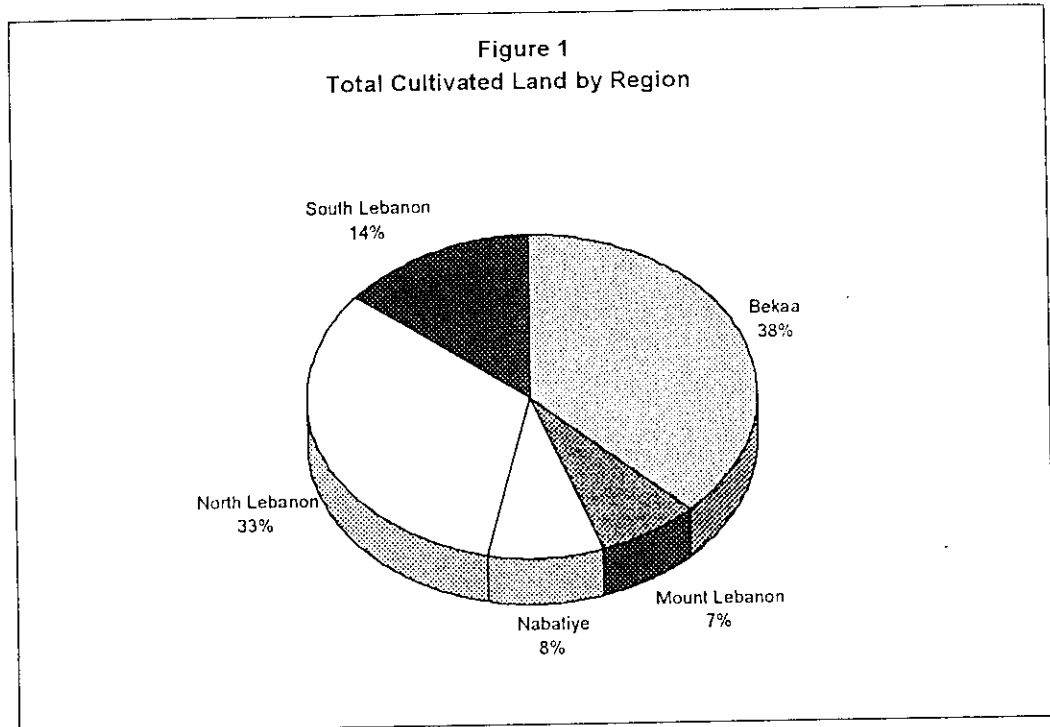
Taking a ten-year period into consideration and tracing the development of cultivated land in the four major Mohafazats, it is clear that there has been considerable growth in the Bekaa, some growth in North Lebanon, little or no growth in South Lebanon and even a decline in Mount Lebanon (Table 11 and Figure3). The period 1992 to 1997 is very special, it is the reconstruction period. While the no-growth in the South is partly explainable by the security disturbances and general lack of stability, the decline in Mount Lebanon has probably more to do with the rise in land prices and the major reconstruction boom that followed the cessation of hostilities.

Land use in Lebanon is partly constrained by the availability of water. While Lebanon is relatively well endowed with water, water exploitation is still limited and highly variable. The water flow from rainfall and snowfall is estimated roughly at 10 billion cubic meters per year, about 4 billion of which is carried by surface flow in 40 rivers. About seventeen of these rivers are perennial and originate from within the Mount Lebanon Range with the exception of the three most well known rivers of Lebanon: the Litani, the Assi (Bekaa) and the Hasbani (Jabel Al Shaikh). With the exception of the Litani and the Assi, all other rivers of Lebanon are quite short (Nahr Abou Ali 42 km and Nahr Al Bared 24 km).

Table 9: Distribution of areas (ha) according to Mohafaza

Mohafaza/Caza	Total area	Area designated for cultivation				Forests 1	Pastures 2
		Rainfed	Irrigated	Greenhouses	Total		
Bekaa							
Baalbeck	235287	47691	25919	53	73663	13631	137886
West Bekaa	41424	8113	10566	15	18694	3449	15581
Hermel	56716	6460	4734	0	11194	11730	30510
Rachaiya	53710	4284	329	2	4615	5460	41260
Zahle	41960	7680	14506	14	22200	1246	13991
Total	429097	74228	56054	84	130366	35516	239228
Mount Lebanon							
Aley	26730	1938	1074	204	3216	4740	16179
Baabda	19843	879	906	179	1964	5453	9031
Chouf	47615	7461	3657	95	11213	6687	24703
Jbail	41185	1625	2613	300	4533	11114	22458
Keserouan	34447	412	1285	50	1747	8027	20365
El Metn	26829	739	1253	21	2013	6200	14354
Total	196649	13054	10788	849	24691	42221	107090
Nabatiye							
Bent Jbail	27164	5817	174	6	5997	1285	18357
Hasbaya	21615	5567	310	1	5878	2012	12752
Marjaayoun	25738	6428	319	0	6747	1379	16251
Nabatiye	30296	8968	1429	22	10419	2400	15994
Total	104813	26780	2232	29	29041	7076	63354
North Lebanon							
Akkar	79787	23114	21611	475	45200	7275	20700
El Batroun	27580	3404	441	23	3868	9808	11773
Bcharre	16068	235	2191	0	2426	2015	10473
Koura	18103	7994	440	6	8440	1717	6459
El Minie	35915	3730	6619	110	10459	2952	20079
Tripoli	2676	569	166	2	737	44	167
Zgharta	17457	6342	1519	7	7868	1982	6138
Total	197586	45388	32987	623	78998	25793	75789
South Lebanon							
Jezzine	24521	2817	1252	19	4088	6742	12396
Saida	26856	6405	6993	300	13698	221	10693
Sour	39797	8793	6807	72	15672	2205	19240
Total	91174	18015	15052	391	33458	9168	42329
Tot. for Lebanon	1021099	177465	117113	1976	296554	119774	527790

1 : Includes abandonned land with bushes and heavy vegetative cover

2: Includes lands that are not suitable for agriculture

Source: Ministry of agriculture, 1997

Table 10: Distribution of areas (ha) according to Mohafaza

Mohafaza/Caza	Area designated for cultivation			
	Rainfed	Irrigated	Greenhouses	Total
Bekaa				
Baalbeck	64.7%	35.2%	0.1%	100.0%
West Bekaa	43.4%	56.5%	0.1%	100.0%
Hermel	57.7%	42.3%	0.0%	100.0%
Rachaiya	92.8%	7.1%	0.0%	100.0%
Zahle	34.6%	65.3%	0.1%	100.0%
Mount Lebanon				
Aley	60.3%	33.4%	6.3%	100.0%
Baabda	44.8%	46.1%	9.1%	100.0%
Chouf	66.5%	32.6%	0.8%	100.0%
Jbail	35.8%	57.6%	6.6%	100.0%
Keserouan	23.6%	73.6%	2.9%	100.0%
El Metn	36.7%	62.2%	1.0%	100.0%
Nabatiye				
Bent Jbail	97.0%	2.9%	0.1%	100.0%
Hasbaya	94.7%	5.3%	0.0%	100.0%
Marjaayoun	95.3%	4.7%	0.0%	100.0%
Nabatiye	86.1%	13.7%	0.2%	100.0%
North Lebanon				
Akkar	51.1%	47.8%	1.1%	100.0%
El Batroun	88.0%	11.4%	0.6%	100.0%
Bacharre	9.7%	90.3%	0.0%	100.0%
Koura	94.7%	5.2%	0.1%	100.0%
El Minie	35.7%	63.3%	1.1%	100.0%
Tripoli	77.2%	22.5%	0.3%	100.0%
Zgharta	80.6%	19.3%	0.1%	100.0%
South Lebanon				
Jezzine	68.9%	30.6%	0.5%	100.0%
Saida	46.8%	51.1%	2.2%	100.0%
Sour	56.1%	43.4%	0.5%	100.0%

Source: Ministry of agriculture, 1997

Figure 2
Distribution of Cultivated Land by Mohafaza
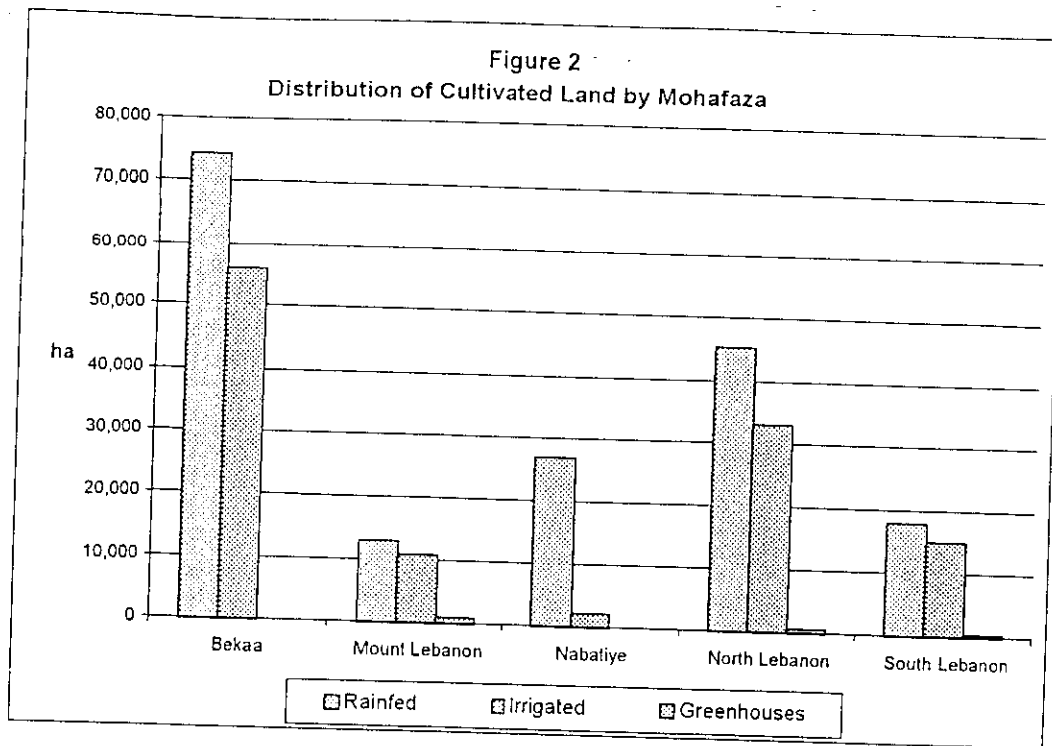
Table 11: Cultivated Land by Mohafaza
1987-1997
(ha)

	1987	1992	1994	1997
North	51,960	68,825	68,274	78,998
South	45,690	70,670	69,767	62,499
Mount Lebanon	34,940	34,607	31,893	24,691
Bekaa	82,410	120,066	120,218	130,366

Source: Ministry of Agriculture, Lebanese Statistics

The average precipitation in Lebanon varies between 1,500 mm per year in the coastal areas, to about 1,000 mm on the mountain slopes to an average of 400 mm in the Bekaa Valley,[4] and this is why agriculture in Lebanon is also dependent on irrigation. Water has long been drawn from rivers and fountains to irrigate crops in the more arid areas of the Bekaa and in the middle and low elevation zones of Mount Lebanon. Most of the rivers of Lebanon are increasingly stressed, the Litani, Hasbani and Wazani rivers are practically under Israeli occupation and probable exploitation. Many other rivers are ecologically stressed from concentrated and unregulated urban and industrial growth and from intensive and unsustainable exploitation.

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4. T. Jaber, Ibid., p. 28 and ESCWA, "National Farm Data Handbook for Lebanon", p. 6, 1999.

Figure 3
Cultivated Land by Mohafaza
1987-1997
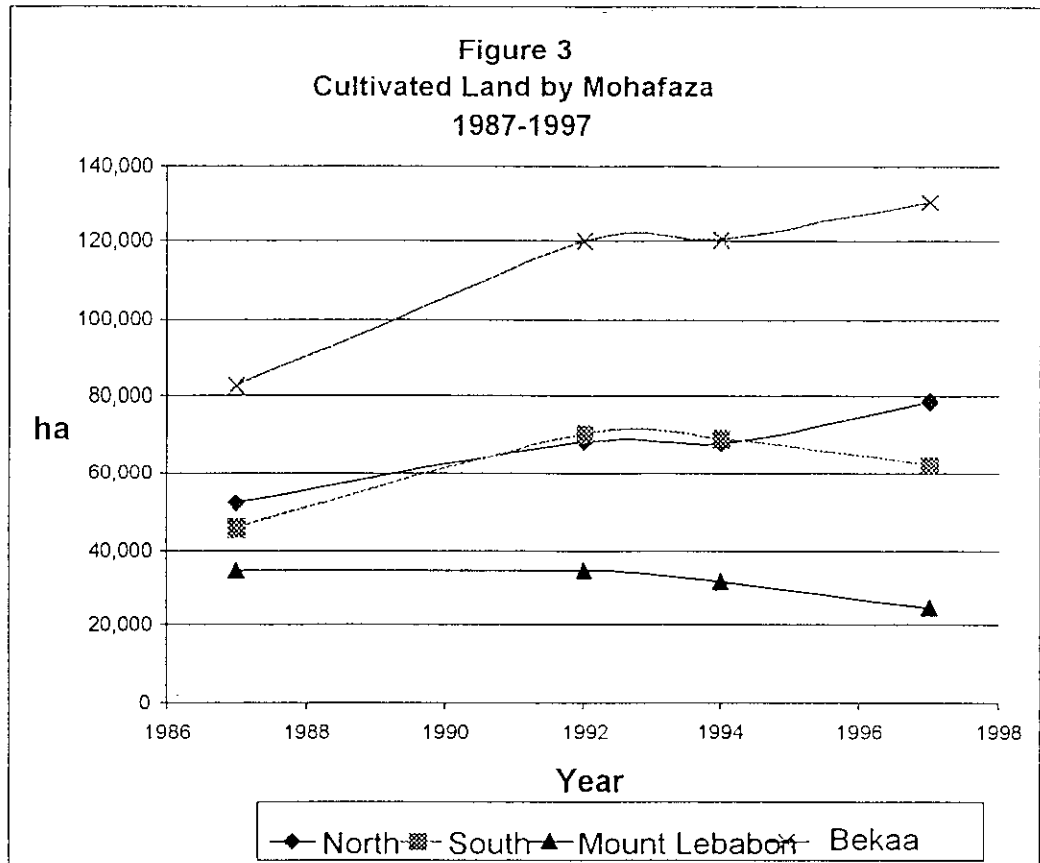
B. LIVESTOCK

The livestock sub-sector typically constitutes 25% of the total agricultural production in Lebanon. The civil war drastically affected this subsector, it has since recovered most of its losses. Between 1991 and 1998, livestock production has grown at the average annual compound rate of 4.16% (Table 12).

The total stock of livestock and its distribution by animal and Mohafaza are presented in Table 13 and figures 4-7. Lebanon produces a large amount of poultry particularly in the Bekaa Valley and in Mount Lebanon. The overall capacity is of 12 million heads. Goats are the largest stock with over 494 thousand also mostly in Bekaa. Sheep are also available in large numbers, a total of 321,726 is estimated, most of which in the Bekaa Valley. Cattle availability is limited with only 56,626 cows, most of which in North Lebanon.

Lebanon is a major importer of meat. This suggests that livestock production is not sufficient to meet the domestic demand. Since 1990 there has been some noticeable increase in almost all livestock numbers but particularly in those of cattle (from 65,000 in 1990 to 80,000 in 1998) and sheep (from 220,000 to 350,000 during the same period) (Table 14).

There are also some noticeable increases in livestock production over the same period (1990-1998). This is particularly true for cow milk which increased from 92,500 tons in 1990 to 200,000 tons in 1998 and for meat (from 130,000 tons in 1990 to 270,700 tons in 1998). Also there was an increase in chicken meat production from 56,000 tons in 1990 to 69,000 in 1998 (Table 15).

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Table 12. Index Number And Annual Change Of Net Agricultural Production In Lebanon For The Period 1990-1998

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Exponential Growth rate:91-98
Cereals	96	104.4	112.1	102	98.8	125.2	117.3	117.6	117.8	2.11
Crops	99.8	110.5	114.4	110	117.8	129	135.1	135.1	140	3.86
Livestock	97.6	113.5	115.2	121	111.6	117.2	126.2	130.1	165.1	4.16
Agriculture	99.4	111.5	116.8	116	120.7	131.2	135	137.7	147.9	4.07
Food	99.4	111.5	116.7	115	119.8	129.7	132.8	135.3	145.5	3.77
Non Food	97	105	128.7	218	250.6	348.5	444.2	475.3	494.7	26.64

Source: Food and Agriculture Organization of the United Nations, AGROSTAT Database, 1990-1998.

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Table 13: Distribution of livestock according to mohafazats

Mohafaza/Caza	Number (heads)			Potenial capacity
	Cattle	Sheep	Goats	Poultry (1000)
Bekaa				
Baalbeck	4094	125914	101850	1608
West Bekaa	2860	35500	30000	192
Hermel	1741	19475	36220	24
Rachaiya	973	8193	44760	18
Zahle	6248	30805	7100	2383
Total	15916	219887	219930	4225
Mount Lebanon				
Aley	859	171	514	88
Baabda	1403	175	3035	54
Chouf	1712	1045	9900	267
Jbail	1470	3837	24852	785
Keserouan	1017	8580	20303	222
El Metn	1856	731	7173	551
Total	8317	14539	65777	1967
Nabatiye				
Bent Jbail	921	3040	20844	65
Hasbaya	837	2140	21184	10
Marjaayoun	2464	8350	12820	41
Nabatiye	1818	4575	13525	114
Total	6040	18105	68373	230
North Lebanon				
Akkar	14404	33759	29937	1756
El Batroun	704	378	5978	1073
Bcharre	87	5420	11406	9
Koura	545	4473	4455	1086
El Minie	2973	7833	30206	141
Tripoli	65	300	200	13
Zgharta	1047	7340	8326	481
Total	19825	59503	90508	4559
South Lebanon				
Jezzine	987	1319	10345	35
Saida	3164	2040	12262	560
Sour	2377	6333	26825	477
Total	6528	9692	49432	1072
Tot. for Lebanon	56626	321726	494020	12053

Source: Ministry of agriculture, 1997

Table 14: Livestock Number By Major Categories In Lebanon For The Period 1990-1998

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cattle	65,000	70,260	73,000	75,000	77,002	59,790	69,875	75,000	80,000
Sheep	220,000	237,539	240,000	241,000	242,975	176,630	312,545	315,000	350,000
Goats	420,000	471,972	452,000	425,000	418,979	437,630	482,220	485,000	450,000
Pigs	45,000	43,703	45,000	48,000	52,795	54,000	58,185	58,500	60,000
Horses	8,250	10,440	9,000	8,000	6,810	5,280	4,919	5,000	5,500
Asses	19,000	21,069	22,000	22,500	23,000	23,500	24,000	24,500	24,500
Mules	7,000	7,971	7,500	7,000	6,500	6,000	5,175	5,500	6,000
Camels	550	630	600	550	530	490	512	530	550
Chicken	23,000	20,387	21,500	23,000	25,580	25,300	25,167	25,500	30,000
Beehives	205,000	195,000	200,000	210,000	215,000	216,000	218,000	220,000	220,000

Source: Food and Agriculture Organization of the United Nations, AGROSTAT Database, 1990-1998.

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Table 15: Livestock Production By Major Categories In Lebanon For The Period 1990-1998
(Ton)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Beef and veal	14,175	14,598	16,200	16,335	14,850	10,935	10,495	13,365	13,500
Cow milk, whole, fresh	92,500	123,494	130,000	135,000	145,000	150,000	156,545	158,000	200,000
Mutton and lamb	7,546	9,570	9,900	11,770	11,880	7,700	6,267	7,920	8,800
Chicken meat	56,000	55,000	54,833	56,000	41,961	58,000	58,163	65,000	69,000
Hen eggs	35,000	32,615	30,000	32,500	22,356	25,760	28,139	30,000	44,000
Honey	1,350	1,306	1,600	1,900	2,130	1,900	1,738	1,800	700
Meat, total	84,611	86,348	89,003	93,885	79,871	89,355	90,268	101,820	106,750
Milk, total	130,000	172,164	182,000	187,500	199,000	207,500	223,763	226,000	270,700
Eggs primary	35,000	32,615	30,000	32,500	22,356	25,760	28,139	30,000	44,000

Source: Food and Agriculture Organization of the United Nations, AGROSTAT Database, 1990-1998

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Figure 4
Number of Heads of Cattle, Sheep and Goats by Mohafaza

Figure 5
Distribution of Cattle by Mohafaza

South Lebanon
12%

Bekaa
28%

North Lebanon
34%

Mount Lebanon
15%

Nabatiye
11%
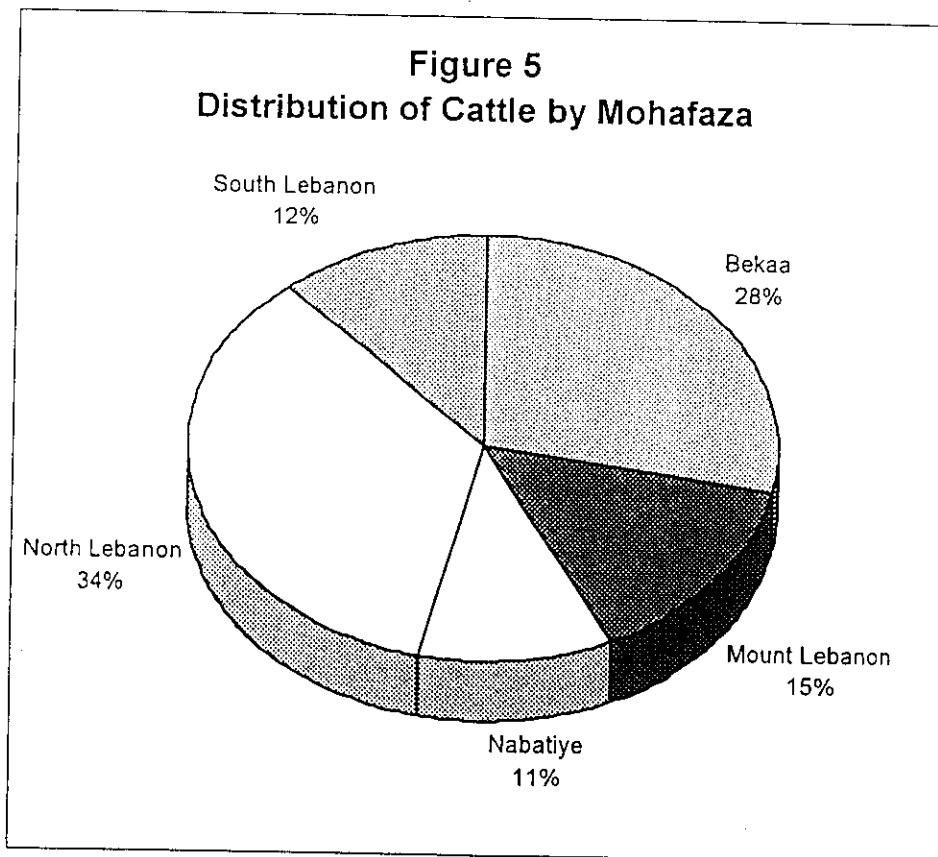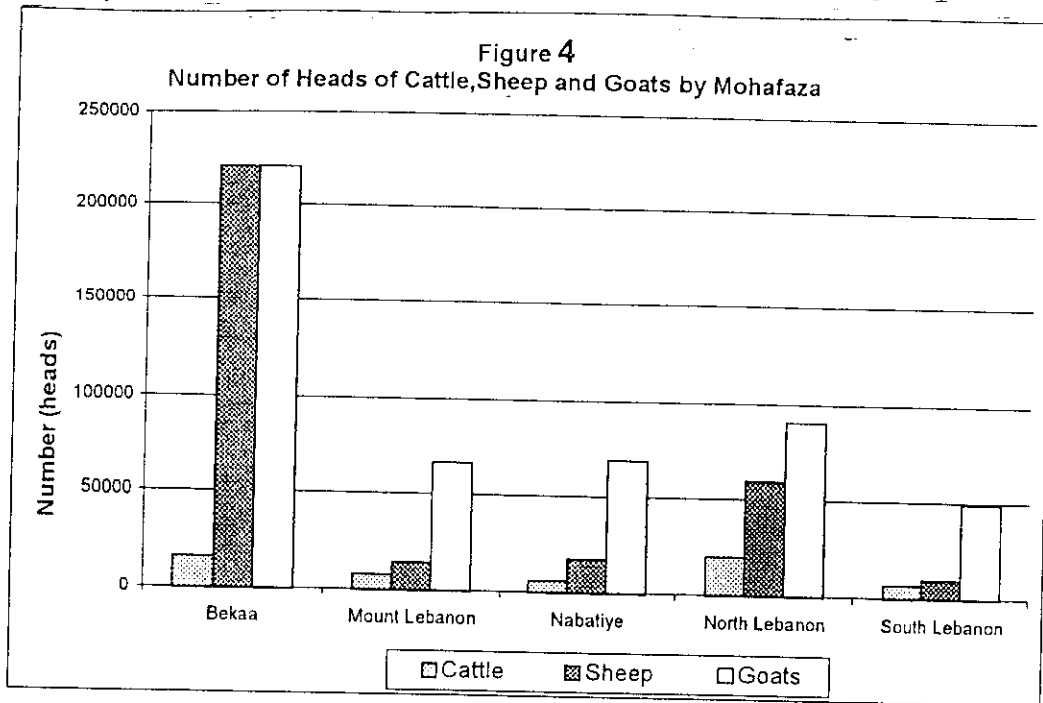
Figure 6
Distribution of Sheep by Mohafaza

South Lebanon
3%

North Lebanon
18%

Nabatiye
6%

Mount Lebanon
5%

Bekaa
68%
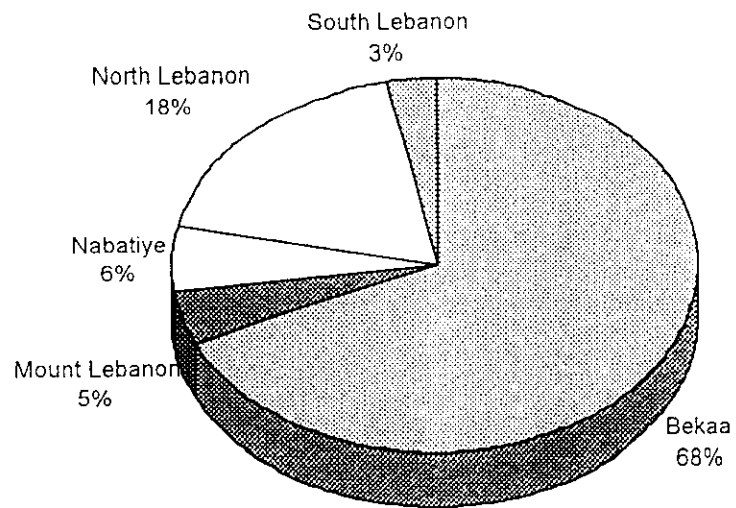
Figure 7
Distribution of Goats by Mohafaza

South Lebanon
10%

North Lebanon
18%

Bekaa
45%

Nabatiye
14%

Mount Lebanon
13%
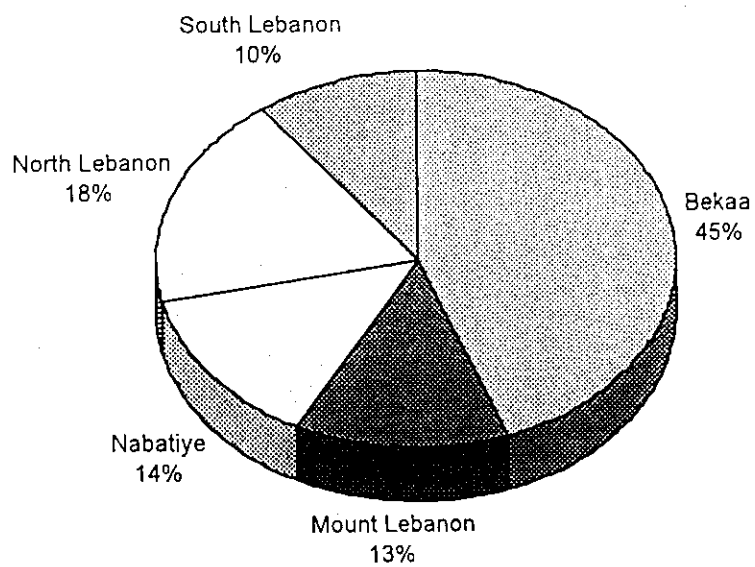
C. CROP PRODUCTION

Lebanon's rich geographical diversity is manifested in the rich assortment of its agricultural products. There is hardly an agricultural product that is not produced in Lebanon (Tables 16 and 17). The coastal plains in the north and in the south support the production of citrus fruits, vegetables, tobacco, figs and even bananas. In the mountainous regions one could find fruits particularly apples, pears, peaches, cherries and olives. In the eastern mountain chain, the arid atmosphere makes it difficult to produce any major agricultural crop. The region's land is basically used for farm animals grazing.[5]

The most important agricultural region of Lebanon is the fertile Bekaa Valley. It is there that we find over 38% of the total cultivated land of the country. And it is there that the widest varieties of crops are produced, ranging from cereals to vegetables and fruits.

Lebanon's agricultural potential exceeds by far the realized capacity. Lebanon, with its highly fertile lands, and great geographical/ecological diversity, is relatively well endowed with water in a region that is basically one of the most water-stressed regions of the globe, and geographically close to some of the most lucrative markets. These areas of strengths have not been fully exploited and the agricultural sector performs below capacity. The macroeconomic environment is far more accommodating of the services sectors than of agriculture. The increase in production noted in (Tables 12 and 16) is more the outcome of the resilient Lebanese farmer than the consequence of supporting policies and institutions.

D. POLICIES AND PLANS FOR THE AGRICULTURAL SECTOR
1. Policies

Lebanon's agricultural policy has always been conceived within the overall national economic policy framework. With agriculture being considered as an important and critical economic sector, no special or specific policies have been developed that contradict or deviate from the general economic policy stance. Lebanon has pursued a liberal economic policy ever since independence. This policy restricted the role of the government to the development of the required social infrastructure and to maintaining a policy environment favourable to free trade. The public sector invested heavily in building an extensive infrastructure of trade routes, ports, airports, warehouses, and an excellent communication network. However, this same policy framework also required the government to restrict its activity in promoting competing commodity producing sectors or regions that could undermine the dominance and the free flow of imports. The accepted liberal policy framework also called for a pro free trade, pro business policy environment with minimal government interference, low or no income or profit taxes, bank secrecy laws and a free foreign exchange market.

This general framework restricted the policy options in agriculture. The government built agricultural roads, dug irrigation canals, and helped from time to time in the reclamation of new lands. Very recently the government moved to support the prices of some selected agricultural crops such as sugarbeet, tobacco and wheat. This support had less to do with supporting the prices of these commodities than with supporting the transition of farming from illicit crops to others.

The production of fruits and vegetables has always received the special concern of the agriculture policy-makers in Lebanon. Farmers in Lebanon have always been capable of meeting domestic demand for these crops and have also been successful in exporting a good proportion of their products. This explains the unique "Agricultural Calendar" policy of the government. This policy dates back to the early 1960s but has also been amended several times, the most recent of which were in 1992 and 1995. The policy stipulates the restriction of imports of citrus fruits, apples, grapes, olives and potatoes. Other agricultural imports need the special permission of the Ministry of Agriculture such as onions, cucumbers, tomatoes and raisins, or can be imported without this permission in special times of the year when Lebanese crops are typically absent or in short supply such as, squash, watermelons, garlic, apricots, peaches, pears, etc.

ESCWA, ibid., P.8.

Table 16. Crop Production By Major Categories In Lebanon For The Period 1990 - 1998
(Hectare)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cereals	77,358	83,213	88,401	80,905	79,109	100,385	93,796	94,025	94,332
Roots and tubers	241,400	269,108	279,413	266,300	323,117	341,930	353,297	306,180	264,724
Pulses	27,070	32,168	35,743	36,560	37,712	39,770	41,039	41,125	41,077
Nuts	17,125	19,096	14,886	20,915	23,520	33,625	43,530	43,750	45,315
Oilcrops, primary	16,215	12,658	25,913	14,290	20,542	15,035	23,941	17,107	24,714
Vegetables	800,000	871,502	893,005	923,650	1,003,624	1,129,410	1,243,799	1,302,100	1,339,351
Fruits	1,210,000	1,358,088	1,309,925	1,228,900	1,221,085	1,314,760	1,234,096	1,259,000	1,293,502
Industrial crops	94,695	7,828	207,801	214,500	234,749	254,650	254,482	282,500	312,698

Source: Food and Agriculture Organization of the United Nations, AGROSTAT Database, 1990-1998.

Table 17: Pattern Of Land Use By Major Crop Categories In Lebanon For The Period 1990 - 1998

(Hectare)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cereals	41,186	41,094	42,097	37,550	38,255	39,077	38,289	38,280	38,296
Roots and tubers	13,330	13,352	13,282	13,060	13,793	14,325	14,633	12,650	13,126
Pulses	16,825	18,010	18,800	18,950	19,257	19,530	19,953	19,915	19,945
Nuts	2,430	2,592	2,682	3,070	3,570	4,370	4,862	5,085	5,147
Oilcrops, primary	46,044	45,917	45,937	45,925	45,706	45,960	50,483	50,610	54,500
Vegetables	41,512	43,842	43,863	44,460	45,472	48,730	52,455	54,605	56,196
Fruits	77,714	79,567	79,327	77,400	74,449	77,900	77,542	79,325	82,714
Industrial crops	3,245	1,624	5,214	6,600	7,182	10,440	13,675	14,700	15,620

Source: *Food and Agriculture Organization of the United Nations, AGROSTAT Database, 1990-1998.*

The direct intervention of the government in the agricultural sector, as demonstrated above, is rather limited. But the government intervention in the agricultural sector is not only limited to its direct involvement, since it also intervenes indirectly through the impact of its overall macroeconomic policy on the agricultural sector. The government systematic pursuit for establishing a financial anchor through a stable exchange rate has had a major impact on the competitiveness and health of the agricultural sector. The targeting of a stable, if not an appreciating Lebanese pound necessitated very high interest rates that are sustained by tight monetary policies to attract capital and to stem out domestic liquidity that could compromise the stability of the exchange rate. The appreciation of the pound reduced the export potential of this sector and the lack of liquidity raised the overall production costs and reduced the capacity to borrow to expand and sustain operations.

Despite the fact that the Lebanese economy has always considered the private sector as the engine of growth, and operated a largely free market, policies towards pricing of utilities have been based more on social considerations than on full cost recovery or marginal cost pricing. The prices for water and electricity are significantly below cost of production levels, and the price of water for irrigation is much lower than the price of water for other applications, suggesting a potential misallocation of resources. Farmers pay for irrigation water at a rate of about LL 240,000/ha (US$ 150/ha), based on an application rate of 8,000 m3/ha, this implies a cost of about US$ 0.02/m3 . This is similar to the cost of irrigation water in neighboring countries. In fact, analysis of a number of projects suggests that the yield and farm surplus generated by most crops would support the full cost of irrigation water. There is no a priori reason for subsidizing the cost of irrigation water in order to support agricultural production.

Most crops in Lebanon are traded at market prices. Nonetheless, in order to encourage the replacement of illegal crops with cash crops, the prices of crops such as tobacco, sugarbeet and wheat are supported to give guaranteed prices to farmers.

Prices of agricultural commodities, as indicated earlier are set by the dynamic forces of the market, with the exception of wheat, sugarbeet, and tobacco. The Office of Cereals and Sugarbeet (OCSB) in the Ministry of Economics and Commerce regulates wheat and sugarbeet production and its related economic activities. Thereby, the OCSB sets the prices of wheat and sugarbeet.

Prior to 1991, the Lebanese government was pursuing an active policy of direct subsidy to the production of wheat through specified budgetary allocations. Nevertheless, since 1991, this practice has been changed to a new form of indirect subsidy financed by the Lebanese consumers. Lebanon, on average, produces around 30,000 tons of wheat per year, while it consumes around 400,000 tons of wheat per anum. The Lebanese importers are obliged by the government to purchase the entire amount of the local wheat production at a high price of US$300 per ton, and then are allowed to import the balance of the consumption needs at the price of US$150 per ton. Through this practice, the Lebanese farmers are secured a sizeable subsidy for the production of local wheat.

In the case of sugarbeet, on the other hand, the government is still directly involved in providing subsidies to local farmers. Lebanon produces around 300,000 tons of sugarbeet per year with relatively high costs of production. The policy pursued by the government puts a ceiling both on the production of sugarbeet and on the amount of land that could be allocated to this crop per year (yearly production ceiling of 300,000 tons and land ceiling of 60,000 dunums). These ceilings placed on the production of sugarbeet can be justified by two factors. First, the local sugar factory has a limited capacity, for it cannot produce more than 30,000 tons of sugar per year. And second, due to budgetary constraints, the government cannot afford to support production levels, exceeding the ceilings. Lebanon consumes around 100,000 tons of sugar per year, 30,000 tons of which are produced locally and the remaining 70,000 tons are imported. Local sugar is normally sold by the government at the price of US$500 per ton, while imported sugar costs US$ 260 per ton. Depending on the sweetness of the sugarbeet, the government purchases the local sugarbeet from farmers roughly at around Lebanese pounds 120,000 per ton, equivalent to US$80, then it pays additional US$17 per ton to the sugar factory for processing the sugarbeet. For the production of every one ton of sugar, 8 tons of sugarbeet with high sweetness and 9 tons of sugarbeet with low sweetness

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are normally utilized. Each ton of sugar then costs the government on average US$800, with low of US$776 and high of US$873.

The government sells one ton of this locally produced sugar at the price of US$500 per ton, so its direct subsidy on average amounts to US$300 per ton. In addition to that the margin between the sale price of local sugar and the imported sugar is also indirectly financed by the consumers. The total subsidy (both direct and indirect) amounts on average to US$540 per one ton of sugar. This policy of higher support to sugarbeet producers is justified based on social grounds and on the need to discourage the production of illicit crops and to reduce rural migration.

As far as the tobacco is concerned, the National Board for Tobacco and Tanbac (NBTT) in the Ministry of Finance (MOF) monopolizes Tobacco and Tanbac production in the country. NBTT sets the prices, buys the farmers' harvest and supplies storage and processing of the product.

NBTT was established in 1935 with a main social objective aiming at maintaining farmers in their lands and preventing them from moving to the cities. NBTT subsidizes farmers by buying their production at a high price, in the south, for example tobacco is subsidized by 50%. In 1998, the total amount of subsidies given to farmers all over Lebanon was $40 million. Tobacco is grown in Lebanon in three different regions: the South, Bekaa and the North. Tobacco grown in the South is of very good quality and is demanded in international markets especially the U.S.A. markets as it is used as a component in cigarette blends at a proportion of 10%.

Recently in Bekaa, farmers started to cultivate tobacco as a replacement for illicit crops but its quality is not as good as that of the South mainly due to the fact that it is irrigated and the type of land is also not suitable for tobacco cultivation. Accordingly, its price is very low and it is not appreciated by consumers. NBTT is subsidizing Bekaa tobacco by around 600%, it buys around 2 million Kg of tobacco from Bekaa at $5/Kg and sells it at 60 cents/Kg.

In the North of Lebanon tanbak as a specific kind of tobacco is cultivated and used for narguileh. NBTT needs are around 500,000 Kg/year but it is obliged to buy 2 million Kg that cannot be sold since the price is not as competitive as that of neighboring countries. NBTT buys the Kg of tanbak from farmers at $5-6 and sells it back at 20 cents. Subsidies on inputs used for tobacco production amount to around $1 million/year. Lebanon exports tobacco leaves and imports cigarettes, and only by doing this, NBTT can make profits to compensate for the losses incurred by subsidizing tobacco growers.

The situation is further illustrated in these figures:

In the South, subsidies amount to 50%, 17,000 farmers cultivate tobacco and 60,000 du are cultivated with an average production of 6 million Kg, the price of tobacco is 11,250 LBP/Kg.

In the Bekaa, subsidies amount to 600%, 6,200 farmers cultivate tobacco and 16,000 du are cultivated with an average production of 1,900,000 Kg, the price of tobacco is 8,400 LBP./kg.

In the North, subsidies amount to 800%, 5,200 farmers cultivate tanbak and 13,000 du are cultivated with an average production of 1,600,000 Kg, the price of tanbak is 9,100 LBP./Kg.

Tobacco leaf exports amounted to 5,700,000 Kg in 1998 securing NBTT a $21 million revenue. Imports of cigarettes amounted to 1,300,000 boxes at a cost of $231 million including import duties. Import duties for cigarettes were 54% but as of April 1999, they increased to 138%, due to the new government's policy. This caused cigarette sales to decline and accordingly, this year NBTT became short of money and will not be able to support farmers as before.

Taking into account the fiscal weakness faced by the government, it is essential that, where possible, costs for services provided are fully recovered. This will also help achieve a more efficient allocation of resources.

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There are no subsidies on physical agricultural inputs and credit facilities are limited to short term loans at market rates of interest. The provision of agricultural credit to small-scale farmers has always been lacking despite the presence of three credit institutions such as:

- Bank of Agricultural, Industrial and Real Estate Credit (BCAIF);

- Nation Union of Cooperative Credit (NUCC); and

- National Bank for Agricultural Development (NBDA).

Yet, it has never become operational, due to lack of incentives for the private sector to invest in agriculture.

Currently, the main source of short term seasonal credit available to farmers is through private and commercial companies supplying inputs on credit basis with high interest rates reaching as high as 30 per cent in some instances, that are to be reimbursed at harvesting time. In addition, some short and medium term credits are also provided to a small number of farmers in the context of some ongoing agricultural projects. Also, financing through loans is provided by commercial banks but at high interest rates, where the agricultural sector as a whole receives less than 2 per cent of the total bank credits, Table18.

Table 18: Times Series Data on Agricultural Credit

Year	Agricultural Credit (Million LL)	Percent of Total Credit Provided
1989	11,586	1.32
1992	60,499	1.26
1993	74,862	1.27
1994	107,055	1.38
1995	179,884	1.76
1996	205,742	1.58
1997	236,682	1.48
1998	291,415	1.51

Source: Central Bank of Lebanon

During the 1950s the official economic five-year plan sought the modernization of the Lebanese irrigation network and the development of the Litani project as well as the Qasimiah project. The aim was to increase the area under irrigation in the coastal plains in south Lebanon and to increase the production of hydroelectricity. By 1975 on the eve of the civil war, Lebanon succeeded in increasing the irrigated land under cultivation by 20 thousand ha in the south and 14,900 ha in the north.[6]

In 1963, the government sponsored the "Green Plan" program in collaboration with several United Nations' organizations including the FAO, UNDP and WFP.[7] The program aimed at:

- Increasing the land under cultivation

- Reforestation of Lebanon

- Preservation and development of the natural water springs

- Rehabilitation of agricultural roads and building new ones

- Expanding the use of irrigation in agriculture

- Water conservation and the expansion of reservoirs and canals.

The program made available to farmers at low rental price tractors and other agricultural implements and distributed improved citrus seeds. The program was considered a successful one as land under cultivation expanded and a new forested areas emerged.

With public sector intervention limited to the provision of agricultural infrastructure and extension services, agricultural production in Lebanon has traditionally been the domain of the private sector. Horizon 2000 continued this approach, focusing on the rehabilitation of rural infrastructure, irrigation and rural roads, and preservation and reclamation and institutional strengthening. The agricultural sector accounted for over 3% of the total Horizon 2000 expenditures. The general emphasis of Horizon 2000 was not only to diversify and increase the production of specialist crops such as exotic fruits but also to increase crop production for the food processing industry. Horizon 2000 also emphasized on increasing animal production for milk and meat purposes.

In 1993 the government formulated a three-year plan to modernise and expand the agricultural sector. The plan aimed at:

- Increasing the net income of farmers

- Increasing the income of agricultural workers to limit their migration to the cities

- Stabilizing agricultural output and input prices while ensuring their competitiveness

- Increasing productivity through increasing the yield on land

- Reducing imports of agricultural products through crop diversification

- Preservation of Lebanon's agricultural wealth and resources

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6.   A. Baalbecki and F. Mahfouz. Ibid, P. 151.

     P. Andeou et. al "*The Agricultural Economy of Lebanon*". (Beirut: American University of Beirut Press, 1979), P. 20.

- Training of farmers through the creation extension services

- Develop new sources and expand old agricultural credit facilities

- Increase the efficiency and effectiveness of agricultural marketing institutions

Many specific measures were taken to implement the plan. These included the streamlining of the Ministry of Agriculture, the revitalization of the extension services, increasing the number and operating budgets of the agricultural research and development centers, expanding rural roads by 100 km each year, expanding and encouraging farmers to join agricultural co-operatives and targeting the preservation of the animal wealth and the environment within which they develop. The enumeration of these tasks is perhaps misleading because they suggest a much more ambitious plan than was realized and implemented. In fact, the government allocated less than one percent of its annual budget to the Ministry of Agriculture throughout the plan years.[8] With limited resources only limited results can be expected.

In 1997, the Ministry of Agriculture formulated another plan (a short-term plan) or a working program entitled "The Working Program of the Ministry of Agriculture till the Year 2000". The total investments needed for the execution of the "Plan 2000" were estimated at LBP.600 billion with LBP.200 billion per year, representing 4 to 5 % of the national budget. However, only 0.38% of the national budget was allocated to the plan.

The working program depends primarily on complete coordination and cooperation between the private and the public sectors. The plan recognizes the importance of developing and supporting the role of rural women. In addition, it emphasizes the need of credit provision. It represents a first step towards the formulation of an agricultural strategy.

The main development objectives of the "Plan 2000" are:

-Increase investments in the agricultural sector

-Increase revenues in agro-rural population

-Improve equity between rural and urban areas

-Increase agricultural production and productivity

-Decrease the per unit cost of production of agricultural products

-Improve the quality of agricultural products to meet the international standards and norms and ensure their competitiveness

-Improve the marketing structure, organize the markets, and support agricultural cooperatives

-Ensure sustainability of the natural ecosystem

As for the specific objectives of the "Plan 2000" they are:

-Increase income generating activities in rural areas

-Improve the adoption of sustainable agricultural production practices

-Improve water management and water use efficiency

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8. Bank of Lebanon, "Annual Report", 1994.

-Increase production and productivity of the important crops (improved crop varieties)

-Improve production and productivity of animal (pure breed) and fisheries production

-Develop the agro-food processing industry sector

-Improve the Lebanese agricultural trade balance by increasing exports

-Improve and conserve natural resources (water, soil, forestry and fisheries)

The Ministry of Agriculture has recently prepared the five-year Agricultural Development Plan for the period 2000-2004 for integration into the Five-Year Economic Development Plan to accompany the financial plan. Taking into consideration the problems and constraints that caused the decline in the importance and productivity of the agricultural sector over the years and concerns over the viability of the sector, the Five-Year Agricultural Development Plan envisages means to improve the status of agriculture in Lebanon, among other things, through enhanced investment. The importance of sound agricultural policies to prevent the degradation of natural resources and to provide resources for the sustainable development of agriculture in Lebanon has been emphasized and ways foreseen to enhance the contribution of agriculture to the national economy and its role in providing income to rural areas and accordingly limiting rural-urban migration. The investment requirement of the plan is estimated at US$413 million, including a US$100 million credit scheme. The plan sets the preliminary target of increasing agricultural production by 15 per cent. It highlights six strategic objectives mainly:

(1)   preserving agricultural and natural resources;

(2)   improving the competitiveness of agricultural production;

(3)   increasing food production;

(4)   facilitating the marketing of agricultural products;

(5)   promoting agro-industries; and

(6)   achieving rural development.

The expected outcomes include increasing farmers' income, improving access to social services and promoting the contribution of women to agricultural production and development.

The plan pinpoints the multidimensional context of rural and community development and emphasizes more on the social dimension of rural development. The plan stresses on the importance of creating job opportunities in rural areas to prevent rural-urban migration and to reduce rural poverty. The nine quantitative targets of the plan include the following:

-       increasing irrigated agricultural land by 5.7 per cent (from 70,000 ha to 74,000 ha);

-       increasing non-irrigated agricultural land by 5.5 per cent (from 197,000 ha to 208,000 ha);

-       increasing cultivated land by 15,000 ha or 5.5 per cent of the cultivated land in 1997 (current cultivated land is 267,000 ha);

-       increasing value of agricultural production by US$ 325 million or by 15.4 per cent of agricultural production in 1996;

-       increasing investment in agriculture and food industries sectors to around US$600 million;

-       increasing exports of agricultural and food products by 45 per cent of 1996 exports(from US$167 million to US$242 million);

-   reducing import of agricultural and food products by US$250 million (imports amounted to US$1529 million in 1997);

-   providing 6,000 job opportunities (both permanent and temporary); and

-   increasing forest area by 23 per cent (from 70,000 ha to 86,328 ha).

Serious focused efforts will be required to achieve those challenging objectives and targets of the Five-Year Agricultural Development Plan for the period 2000-2004.

الجمهورِيَّة اللبنانِيَّة
مكتب وَزير الدَولة لِشَؤُون التنميَة الإداريّة
مَركز مشَاريع وَدرَاسَات القطاع العَام

V. THE POLICY ANALYSIS

A. OBJECTIVES OF THE POLICY ANALYSIS

In many developing countries the economic potential of agriculture is yet to be exploited. Although the technological advancement possibilities have become increasingly more favorable, the economic opportunities required for farmers in these countries to realize this potential are far from favorable. Until recently, the development literature gave scant attention to the effect of trade and macroeconomic opportunities available to agricultural producers. One reason for this is the narrow sector specific orientation of past agricultural policy analysis; another is the widespread misconception that agriculture plays a limited role in economic development.

Rapid industrialization has been the main focus of development policies in most developing countries. In their pursuit to promote domestic industries, however, many of these countries distorted price incentives against agriculture. These measures substantially diminished the positive effects of public investment policies that were intended to support agricultural research and extension, the development of rural infrastructure and the marketing of agricultural exports. As a result, the agricultural output of these countries has been lower than it would have been under a more neutral incentive structure; the real purchasing power of the rural population has declined, and many of these countries have experienced a significant demand side constraint on economic growth.

In an open economy, price mechanism and markets play a significant role in resource allocation and production. Nonetheless, the public sector plays an important role in strengthening markets by: 1) providing the necessary infrastructure such as roads, irrigation systems and market places; 2) providing marketing information, research and extension; 3) enforcing macroeconomic policies that avoid high rate of inflation and overvaluation of the exchange rate; and 4) creating suitable environment for competition.

The purpose of this study is to determine the impact of public policies such as input- output prices, factor prices, credit, interest rates and the exchange rate on the efficiency of selected crops produced in nine agricultural zones in Lebanon. The crops selected in each zone were those that reflect best the type of prevalent agriculture in the zone and where we believed that Lebanon either already have a competitive advantage or could easily acquire one

An attempt has been made here to assess and evaluate the impact of development policies and the incentive structures under which agriculture is practiced in Lebanon. Crop budgets prepared by ESCWA[9] were used to build several accounting matrices known as Policy Analysis Matrix (PAM). These matrices were designed to assist in understanding the interactions of many policies that influence agricultural incentives and help illuminate the tradeoffs (if any) between policy objectives[10], and the consequences of market failures and policies used to correct for them.

To compare the return of perennial crops (Tree crops) with annual crops, the cost and return streams of cash flow should first be discounted (to find their present value) and then annualised. The rate of discount is of major importance in determining the present value of a stream of future benefits and cost from an investment venture. Discount rates of 12 percent and 6 percent are typically used for the calculation of the present values in private budgets and social budgets, respectively. This discounting, however, was not done in this study. Annual tree crops were treated as if they were the steady-state output of trees.

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9.   United Nations Economic and Social Commission for Western Asia, "National Farm Data Handbook-Lebanon", (United nations, New York, 1995).

10.   Eric A. Monke and Scott R. Pearson, The Policy Analysis Matrix for Agricultural Development, Cornell University Press (Ithaca, New York, U.S.A., 1989), p. 18-19.

B. THE POLICY ANALYSIS MATRIX (PAM)

1. Empirical model

Economic profit is the main focus of the Policy Analysis Matrix (PAM). Profit is defined as the difference between the value of output (revenues) and the cost of all input (costs).

TABLE 19 THE POLICY ANALYSIS MATRIX

Item	Revenues	Costs of Tradable Inputs	Costs of Domestic Factors	Profits
Private Prices	A	B	C	D
Social Prices	E	F	G	H
Effects of Policy and other Divergences	I	J	K	L

The symbols (capital letters) are defined as follows:

A   Revenue in private prices (prevailing market prices, also called financial prices).
B   Costs of tradable inputs (such as fertilizers, seeds, plastic mulch, etc.) in private prices.
C   Costs of domestic factors (such as labor, capital, etc.) in private prices.
D   Private profit.
E   Revenues in social prices, also called economic or efficiency prices.
F   Costs of tradable inputs (such as fertilizers, seeds, plastic mulch, etc.) in social prices.
G   Costs of domestic factors such as (labor, capital, etc.) in social prices.
H   Social profits.
**   Private Profits (D)   D= A-B-C
**   Social Profits (H)   H= E-F-G
**   Output Transfers (I)   I= A-E
**   Input Transfers (J)   J= B-F
**   Factor Transfers (K)   K= C-G
**   Net Transfers (L)   L= D-H or L= I-J-K

Table 19 shows the PAM model. Private profits are defined in the first row as D=A-B-C. The letter A is used to define the private revenues (the revenues at the prevailing market prices). Costs are divided into two components. Costs of tradable input (inputs which are traded in the world markets) such as fertilizers, pesticides, and seeds are included in the second column. In the first row, second column, the value of tradable inputs at the prevailing market prices (private prices) are recorded and denoted by the letter B. Tradable inputs can be imported from or exported to other countries.

The third column of the matrix includes domestic factors, the second component of costs. Costs of domestic factor in private prices are denoted by the letter C. Domestic factors such as land, water, labor, and capital are also called non-tradable inputs because there is no international market for these inputs.

Column four in the matrix is labeled as profits. Private profits, denoted as D in the matrix, are included in the first row of the fourth column. Profits are defined as revenues minus costs. Positive profits at prevailing market prices confirm the profitability of the business. Positive profits also provide stimulus for existing firms to

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increase output and expand the business. Expansion of existing firms as well as entry of new firms in the market stimulates economic growth. When the market prices of inputs or outputs are distorted by taxes or subsidies, then private profits alone could provide misleading signals.

The second row of the PAM is used to calculate social profits, $H=(E-F-G)$. Social profits are those profits calculated at efficiency prices. The letter E portrays the revenues valued at efficiency prices (social prices) and F and G indicate the efficiency values of tradable inputs and domestic factors, respectively. Positive social profits (H) indicate incentive for expansion of the activities under consideration and result in apparent growth of national income.

The third row of the matrix shows the divergences or differences between the first row (private valuation) and second row (social valuation). If market failure does not exist, then all divergences between private and social prices of tradable outputs and inputs are caused by distorting policies. Policies which may cause divergences include subsidies, taxes and quantitative controls applied to domestic production or trade of the commodity. Price policies may also cause distortions.

In the third row, if the value of I, defined as output transfer, is positive then private revenues exceed social revenues. This indicates that the Government is subsidizing output prices. That is, the Government is purchasing production in prices greater than international market prices. The value of the difference is a transfer from the treasury to the producers of that commodity. If the value of I is negative, then social revenues are greater than the private revenues. This means that the Government is taxing producers. In other words, the Government is purchasing production in prices lower than those prevailing in international markets. The tax in this case is a transfer from producers to the treasury.

The differences between the private costs and social costs of tradable inputs is represented by the letter J. If J is negative, the private costs of tradable inputs are lower than the social costs. This means that the Government is subsidizing the costs of inputs as these inputs are sold at prices lower than those prevailing in the international markets. On the other hand, if J is positive, then private cost of inputs are greater than the social costs. This indicates that the Government is taxing the price of inputs used by farmers. The net effect is that prices paid by farmers are greater than the world market prices.

The divergences in domestic factors are portrayed by the letter K. The Government can affect the prices of domestic factors such as capital or land. When any factor of production is subsidized, the private cost of a domestic factor will be less than the social costs and K will have a negative value. But, if the Government taxes domestic factors, which rarely is the case in developing countries, K will have a positive value.

Commodity-specific policies on taxes and subsidies directly affect the prices of outputs or inputs. Governments may use indirect policies such as the manipulation of the exchange rate of the country's currency to affect commodity prices. Since in PAM, accounting is done in domestic currency and world prices are reported in international currencies, hence an exchange rate is required to express international prices in their domestic equivalents.

The effect of exchange rate manipulation depends upon whether the policy results in over or under valuation. An overvalued exchange rate occurs if there is an excess demand for foreign currencies, which results in extra foreign borrowing, excessive drawing down of exchange reserves, or rationing of foreign exchange among domestic users. "An undervalued exchange rate reflects an excess supply of foreign exchange that is accumulating as excessive reserves and reducing potential income"[11]. An overvalued exchange rate inflicts an implicit tax on producers of tradable exportable goods. Overvaluation reduces the competitiveness of the local producers in international markets because they are practically being taxed. Undervalued exchange rate exerts the opposite effects.

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11.   Eric A. Monke and Scott R. Pearson, The Policy Analysis Matrix for Agricultural Development, Cornell University Press (Ithaca, New York, U.S.A., 1989), p. 24.

The official exchange rate may differ from the social exchange rate. In the PAM approach, this distortion in the exchange rate is actually corrected once border prices are converted to domestic prices at the social exchange rate rather than at the official rate.

The letter L denotes the net effect of all policies on the commodity system. If the overall effect of all policies on input and output prices is in favor of the producers (in the short run), L will have a positive value. Alternatively, L will have a negative value, if the policies work to the detriment of the producers.

2. Measures of protection

Standard ratios reflecting the degree of price distortions are normally calculated to compare profitability and efficiency of different crops. These ratios facilitate comparisons among activities, particularly when the production process and outputs are dissimilar. The ratios can also be used to rank alternatives according to different policy objectives. A number of protection coefficients could be calculated in a standard PAM. The most commonly used protection coefficients are Nominal Protection Coefficients (NPC) and Effective Protection Coefficient (EPC).

The objective of calculating NPC is to measure the actual divergences or distortions between domestic prices and international or border prices of output12. The NPC is calculated by dividing the revenue in private prices (A) by the revenue in social prices (E). If NPC is less than one it confirms the presence of taxes on outputs. An NPC greater than one shows the presence of subsidies. An NPC equal to one (in the absence of market failures) reveals the absence of intervention, a property desired by most international donor agencies.

The EPC is another measure of incentives to farmers13. It is defined as the ratio of value added in private prices (A-B) to value added in social prices (E-F). This coefficient indicates the combined effects of policies on tradable commodities (inputs and outputs). The EPC is a useful indicator that measures the whole structure of incentives/disincentives which may exist with respect to a given production process. An EPC less than one indicates negative effects of policy (a tax), whereas an EPC greater than one indicates positive effects of policy (a subsidy).

The incentive effects of all policies affecting the production of the selected products are measured by the Profitability Coefficient (PC). The PC can be used as a proxy for the net policy transfer (L). However, its use is limited when either private or social profits are negative.

The Private Cost Ratio (PCR) explains the ratio of domestic factor costs (C) to value added in private prices (A-B). This ratio demonstrates the ability of the production system to cover the cost of the domestic factors and continue to be competitive. This ratio is important for investors because they can maximize their profits by minimizing the cost of tradable inputs and factors.

3. Measures of comparative advantage

Comparative advantage could be measured by the Domestic Resource Cost (DRC) ratio. DRC determines whether the production of a specific crop makes efficient use of the domestic resources. The same set of data used to estimate the protection coefficients could also be utilized to estimate the comparative advantage of a specific crop in a particular region.

12.   Food and Agriculture Organisation of the United Nations, "Comparative Advantage of Agricultural Production Systems and its Policy Implications in Pakistan", FAO Economic and Social Development Paper (68), (Rome, 1987), p. 2.

13.   R. Naylor and C. Gotsch, "Agricultural Policy Analysis Course-Computer Exercises", Food Research Institute, Stanford University, Palo Alto, CA,USA (July 1989).

The DRC, as a measure of efficiency or comparative advantage, is calculated by dividing the factor cost in social prices (G) by the value added in social prices (E-F)[14]. A DRC greater than one indicates that the cost of domestic resources used to produce the commodity is greater than the contribution of its value added at social prices meaning a comparative disadvantage. A DRC less than one indicates that the country has a comparative advantage in producing that commodity, or that the commodity is making efficient use of the domestic resources.

4. Modeling assumptions

(a)   Selection of commodity systems

Major crops produced in Lebanon were selected for the policy analysis. The main objective of constructing the Policy Analysis Matrix (PAM) for these crops was to estimate indicators of policy incentives, efficiencies, and profitability.

(b)   Social valuation of tradables and non-tradables

A major task in the building process of the Policy Analysis Matrix (PAM) is the social valuation of outputs and inputs. Social prices in the PAM are also referred to as efficiency prices. Social or efficiency prices demonstrate the opportunity costs of consumption. World prices of inputs and outputs are the cornerstone for estimating the efficiency prices.

The social prices can be calculated by adjusting the international market prices for exchange rate, insurance, handling, losses, domestic marketing and transport costs to the farm level. Different assumptions could be used for adjusting the prices of different inputs and outputs.

The tradable products should be identified before performing the social valuation. The products then can be classified into exportable and importable categories. Exportables are local products that could be exported. Importables are imported or locally produced import substitutes. Other importables include seeds, machinery, chemicals, and fertilizers. Non-tradables include land, water, domestic transportation, fixed capital, and labor.

Unlike many other developing countries, Lebanon's free market economy generates a large set of market prices that are derived in competitive settings free from any real or substantive government intervention. For instance very little difference could be found between the prices of modern fertilizers sold in international markets and those in Lebanon save for those normal freight, insurance and delivery charges. But like many other developing countries, there are major market failures in a number of spheres. This is particularly so with respect to the exchange rate, the interest rate and the price of water

(c)   Equilibrium exchange rate

There are five major approaches to determining the market future value of an exchange rate. These approaches range from the simple and often wrong approach predicated on the random walk hypothesis to the more sophisticated intermediate-term model-based equilibrium exchange rate. These approaches have had a mixed predictive power, but some have done better than others.[15]

First, there is the Random Walk Hypothesis, which states that the probability of a rise in the exchange rate is equal to the probability of a fall. In general this theory suggests that the exchange rate today is a good predictor of its future value.

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14.   R. Naylor and C. Gotsch, "Agricultural Policy Analysis Course-Computer Exercises", Food Research Institute, Stanford University, Palo Alto, CA, USA (July 1989).

15.   P. Krugman and M. Obstfeld, *"International Economics: Theory and Policy"*, (New York: Addison-Wesley), PP. 331-367. 1995

Second, is an approach that begins by assuming financial markets to be efficient. Any difference in rates of returns on similar assets in different markets will be eliminated. Suppose there exists a safe dollar-denominated bond that pays 10% a year, and a similarly safe Yen-denominated bond pays 5% a year. The market will ensure that the dollar (Yen) returns on both bonds will be the same. If not, the interest rate on the bond, which is expected to earn less, after allowing for changes in the exchange rates, would rise to compensate. Implicitly, then the market would expect the dollar to depreciate against the Yen by 5% a year—sufficient to equalize the total returns. This is the same as suggesting that the exchange rates will change to achieve Uncovered Interest Parity (UIP). As long as the Lebanese interest rates on Lebanese bonds are higher than the risk premium on similar bonds in dollars, the Lebanese Pound will depreciate until the returns are equalized.

Third, is an approach that calculates the exchange rate that will allow the balance of payment to be in equilibrium. The exchange rate that produces equilibrium in the balance of payment (or forces the excess demand for foreign exchange to zero) is known as the Fundamental Equilibrium Exchange Rate (FEER).

Fourth, is an approach that suggests that exchange rates move in such a way as to equalize prices in different currency areas. This approach targets the establishment of parity in purchasing power (PPP) rather than in the returns on financial assets. One may expect this to work in the long run but cannot be used to determine exchange rates over a short or medium term period.

Fifth, a new approach has emerged that combines the UIP and FEER approaches. The new approach suggests that exchange rates changes are governed by interest rate differentials plus a risk premium. The latter is influenced by variables that FEER proponents use in their models. The intermediate-term model-based equilibrium exchange rate (ITMEER) approach can generate exchange rate predictions that are not significantly different from those of the UIP and FEER when those are special cases.

The over-valuation of the Lebanese pound is maintained by a very high interest rate policy. The interest rate is maintained at levels that the Central Bank believes as necessary to stabilize the LBP. This is done through attracting financial capital into Lebanon and also by stemming domestic liquidity with few borrowers if any besides the government that has become increasingly reliant on banks to finance its large deficits and sustain its debt. Thus our prediction of the equilibrium exchange rate is a synthetic prediction that calculates the FEER and confirms it with an UIP calculation. The equilibrium exchange rate was estimated by running regression equations for the import and export functions with respect to the exchange rate. The equilibrium rate was considered as the one that equates the two functions. It may be claimed that the equilibrium exchange rate should be determined from the entire balance of payments account. This in our opinion would bias the exchange rate towards the capital account. We were more interested in an exchange rate that would balance the trade account.16 We found the equilibrium exchange rate to stand at LBP 1,842.5 to one US dollar. The current market exchange rate is LBP 1,507. This suggests that the exchange rate is about 22% over-valued. In our calculations of social parameters we used the calculated equilibrium exchange rate. This value is consistent with the fact that great proportions of bank deposits in Lebanon are in US dollars (over 60%). However, this ratio is high because depositors believe that the LBP is artificially over-valued and would soon depreciate its true equilibrium value.

(d)   *Social prices of tradables*

Farm gate level social prices of importables (and import substitute) commodities such as avocado, wheat, sugarbeet, melon, watermelon, eggplant, squash and cucumbers were derived by using the import parity prices, as per equation1. Farm gate level social prices of exportable commodities such as citrus, apple, pears, olives, tomatoes, potatoes, bananas, grapes tobacco, carrots and strawberries were derived by using the export parity prices, as per equation 2.

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16. The export regression equation is as follows: 2332 − 0.997476 ER. With an R^2 of 0.68 and the import regression equation 46315 − 24.86825 ER with an R^2 of 0.844. Solving for ER (exchange rate) we got 1,842.5 LB per Dollar.

Farm gate level social prices of fertilizers, chemicals and seeds on the other hand, were derived differently. In this context, the farm gate level private prices in Lebanese pounds for those items were first converted into US$ by the official exchange rate. Then, those US$ prices were reconverted by the equilibrium exchange rate in local currency. After this process, tariffs and other tax related changes were deducted to arrive at farm gate level social prices for the said categories. The farm gate level social prices for machinery were only adjusted for the exchange rate differential.

EQUATION 1. IMPORT PARITY PRICE

Where:

IPP	=	Import Parity Price;
OPP_{cif}	=	Observed Port of Entry Price;
EER	=	Equilibrium Exchange Rate
HCP	=	Handling Costs at Port of Entry;
TCBM	=	Transport Cost from Border to Market;.
MC	=	Marketing Costs;
TCFM	=	Transport Costs from Farm to Market, and
TPC	=	Total Processing Cost at the Factory.

EQUATION 2. EXPORT PARITY PRICE

Where:

EPP	=	Export Parity Price;
OPP_{fob}	=	Observed Port of Entry Price;
EER	=	Equilibrium Exchange Rate
HCP	=	Handling Costs at Port of Entry;
TCBM	=	Transport Cost from Border to Market;.
MC	=	Marketing Costs;
TPC	=	Total Processing Cost at the Factory, and
TCFM	=	Transport Costs from Farm to Market.

(e) Social prices of non-tradables

Domestic factors not traded internationally are referred to as "non-tradable inputs", meaning that there are no international prices for these factors. The social prices of domestic factors such as land, water, capital, and labor, are determined in the domestic economy of the country.

Various approaches may be used to estimate the social prices of these resources. One approach is to use the outputs of a general equilibrium model, as estimates for the social prices of domestic factors. However, a general equilibrium model was not available for Lebanon, thus, alternative approaches were used to estimate the social prices of each factor.

(i) Social (Shadow) Price of Water

Can we put a price tag on water? We can at least consider the replacement cost or its marginal cost of production and delivery. At one extreme is the $1.50 per cubic meter replacement value through desalination. On the other hand, from work with WAS (Water Allocation System) at Harvard and work with ASAP (Allocation System for Agriculture in Palestine), it seems that a value of $0.20-$0.25 per cubic meter is more consistent with the value of marginal product of water in agriculture in Lebanon. This cost is free of any subsidies or delivery costs. It simply measures the

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average shadow price in an area that is relatively endowed with water (in WAS and ASAP this would be northern Palestine).

Typically the profit-maximizing farmer employs more of an input as long as its marginal value is greater than its cost. The farmer's demand for water is derived from the value of its use in crop production (value of marginal physical product, which is the marginal physical product multiplied by the output price). Two basic methodologies are used in estimating water values. These include crop water production function analyses and farm crop budget analyses.[17] Both make heavy use of linear programming techniques of the type we used in WAS and in ASAP.

The relationship between inputs and outputs of crop production can be expressed mathematically as the crop production function. If all other inputs are held constant, the marginal physical productivity of water for each acre-inch of water used on the crop can be calculated. The marginal value of each acre-inch is the marginal product times the crop price. This procedure relies on the assumption that applications of different amounts of water require the same labor, fertilizer and other non-water input costs. Most crop-water production functions are determined from data collected during controlled experiments, where plots of crops are grown with water as the only variable input. Crop water production functions have also been estimated from aggregate farm data. However, these functions have not been crop specific, and in addition suffer from statistical problems arising from interrelationships among the variables.

In most places and for most crops, the actual physical productivity of water is not known. Nonetheless, representative farm crop budgets can be used to estimate the maximum revenue share of the water input, thus bypassing the need for a physical productivity measure. The total crop revenue less non-water input costs is a residual, the maximum amount the farmer could pay for water and still cover costs of production. This value, divided by the total quantity of water used on the crop, determines a maximum average value, or willingness to pay for water for that crop. An alternative way will use Linear Programming analysis from representative farms to determine irrigation water values. For the calculation of water values in irrigation, the LP objective function is to maximize net returns for a farm of specified acreage, subject to the constraints which may be economic, technological, financial or physical. Average water values by crop are estimated by deriving a series of LP solutions for a range of water costs, all other constraints on the representative farm remaining static. The set of solutions is a water demand schedule for the farm.

WAS and ASAP use a similar approach to the LP above, however, the entire agricultural sector is aggregated together in WAS whereas ASAP allows for a crop by crop basis. The shadow price on the water availability constraint in the northern parts of Palestine was assumed to hold for Lebanon

(ii)   *Capital*

The over-valuation of the Lebanese pound is maintained by a very high interest rate policy. The interest rate is maintained at levels that the Central Bank believes as necessary to stabilize the LBP. This is done through attracting financial capital into Lebanon and also by stemming domestic liquidity with few borrowers if any besides the government that has become increasingly reliant on banks to finance its large deficits and sustain its debt. Although the interest rate has recently fallen, it is still at least 5 percentage points above the opportunity cost of borrowing in US dollars. It is the US dollar borrowing rate that is used in evaluating the social cost of borrowing (11%).

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17.   Diana. C. Gibbons, *"The Economic Value of Water"*, (Washington, D.C.: Resources for the Future). 1986

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(iii)   *Labor and Land*

Prices of land and labor appear to reflect opportunity-cost and are therefore taken to represent market prices. Labor in agriculture is typically Syrian labor and the wages paid in this sector appear to reflect the cost of this labor. Urban sprawl has claimed a good deal of land previously used in agriculture. The competing claims on land are reflected in the differential rents paid in the different agricultural zones in Lebanon. This suggests that land rents reflect market forces and competing alternatives.

VI. RESULTS AND DISCUSSIONS

The analysis of results focuses on the impact of policies as well as of market failures on the competitiveness and efficiency of major crops grown in Lebanon.

After selecting some major crop enterprises, representative budgets for each crop enterprise were constructed and calculations were made for some widely used indicators such as gross margin (returns to major factor of production including land, labor and water), breakeven yields and prices as well as cost of production in the context of Lebanon to find out whether these crop enterprises are profitable or viable under the current levels of technology and prices.

The initial readings based on the review of the above indicators confirm an interesting point stating that despite the relatively high costs of production, as compared with the neighboring countries, farming in Lebanon is still a profitable enterprise.

These indicators also reveal that the size of profit is highly sensitive to the level of prices and yields. Thus with stable prices and increased productivity, the profitability of the crop enterprises could be sustained on the long term.

In what follows, first the results of the policy analysis matrix for Lebanon will be presented (Tables 20-21) and then the results by agro-ecological zones will be discussed in details (Tables 22-30).

Lebanon produces a variety of crops such as cereals, industrial crops, fruits, vegetables, tubers and pulses, flowers and others. Lebanon produces large quantities of crops such as apples, pears, grapes, citrus, bananas, olives, strawberries, potatoes, tomatoes, and tobacco for local consumption and export. Other crops such as wheat, sugarbeet, watermelons, avocado, melons, squash, eggplants and cucumbers are produced in Lebanon, but they do not satisfy all local needs and as a result Lebanon imports part of its requirement from external markets.

Bearing in mind the above distinctions, the status of each major crop in Lebanon as a whole is discussed below (Tables 20 and 21).

Wheat is considered as an import substitute crop in Lebanon as it meets partial requirements of the local market (14 per cent). The Bekaa is the leading producer of wheat in Lebanon and it produces 66 per cent of the local wheat. The North, South and Nabatiyeh share the remaining 16, 10 and 7 per cent of local wheat production respectively. Currently the production of wheat is profitable at private prices but not at social prices. The wheat enterprise enjoys an effective protection of over 50 per cent, and it is produced inefficiently as confirmed by the domestic resource cost ratio, which is 1.2 (Table 20). This means that the production of wheat is not economical in Lebanon and it is costing the Lebanese economy a large sum, in other words, Lebanon does not have a comparative advantage in the production of wheat. In the absence of effective protection this crop cannot compete with imported wheat, thus the current policy of high price support for wheat cannot be justified on economic grounds.

Sugarbeet is mainly produced in the Bekaa. Lebanon does not import sugarbeat as such directly. However, sugarbeet production is satisfying only 30 per cent of the local sugar consumption and as a result, 70 per cent of the sugar is annually imported. Following this logic, sugarbeet is also an import substitute crop in Lebanon. The production of sugar beat is currently profitable at both private and social prices. This crop enjoys an effective protection of 46 per cent. The DRC for this crop is still below 1, thus in terms of efficiency it is not a burden on the economy and Lebanon still has comparative advantage in its production. However, in the absence of effective protection, the production of sugarbeet may not be sustainable. This is one of the crops introduced in the Bekaa Valley as a replacement to illicit crops. Therefore, the Government is justifying subsidies for sugarbeet in this context as well as on some other social considerations.

Tobacco is largely produced in Nabatiyeh and in the South, each sharing 45 per cent and 21 per cent of local production. Bekaa and the North, share the remaining 18 and 16 per cent of local production

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Table 20: Indicators Of Competitiveness, Efficiency And Policy Impacts Calculated For Major Crops Grown In Lebanon (in thousand Lebanese Pounds)

ITEMS	CUCUMBER	TOMATO	EGGPLANT	CARROT	POTATO	SQUASH	SUGARBEET	MELON	TOBACCO	WHEAT
PRIVATE PROFIT	4104.70	7940.93	94.95	248.81	123.50	869.83	96.33	331.62	559.95	30.10
SOCIAL PROFIT	10670.86	8457.93	3604.13	1153.68	465.10	1604.13	22.92	2433.40	100.64	-22.46
PVA(A-B)	7093.20	11027.24	717.38	701.39	545.23	1582.55	647.95	744.42	1316.45	165.83
SVA(E-F)	13690.92	11580.99	4038.67	1527.31	882.40	2361.06	443.43	2890.14	789.79	109.60
OUTPUT TRANSFER	-6734.62	-562.69	-3326.31	-839.90	-348.42	-784.20	169.40	-2166.08	526.71	50.01
INPUT TRANSFER	-136.90	-8.93	-5.01	-13.97	-11.25	-5.70	-35.12	-20.36	0.05	-6.21
FACTOR TRANSFER	-31.56	-36.76	187.89	78.94	4.44	-44.20	131.12	-43.93	67.35	3.66
NET TRANSFER	-6566.16	-517.00	-3509.18	-904.87	-341.60	-734.31	73.40	-2101.79	459.31	52.56
PCR (C/A-B)	0.42	0.28	0.87	0.65	0.77	0.45	0.85	0.55	0.57	0.82
DRC(G/E-F)	0.22	0.27	0.11	0.24	0.47	0.32	0.95	0.16	0.87	1.20
NPCo(A/E)	0.60	0.96	0.30	0.51	0.75	0.71	1.21	0.36	1.54	1.25
NPCi (B/F)	0.96	1.00	0.99	0.93	0.98	0.98	0.90	0.96	1.00	0.93
PC (D/H)	0.38	0.94	0.03	0.22	0.27	0.54	4.20	0.14	5.56	-1.34
EPC{(A-B)/(E-F)}	0.52	0.95	0.18	0.46	0.62	0.67	1.46	0.26	1.67	1.51
MTD{(D-H)/(E-F)}	-0.48	-0.04	-0.87	-0.59	-0.39	-0.31	0.17	-0.73	0.58	0.48

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Table 21: Indicators Of Competitiveness, Efficiency And Policy Impacts Calculated For Major Crops Grown In Lebanon (in Thousand Lebanese Pounds)

ITEMS	APPLE	AVOCADO	BANANA	CITRUS	GRAPE	OLIVE	PEAR	STRAWBERRY	BANANA (Gh)	WATERMELON
PRIVATE PROFIT	960.00	207.38	2734.12	1115.21	222.15	273.54	666.20	10831.41	4112.60	1017.44
SOCIAL PROFIT	4349.89	1656.44	2660.43	3200.24	1144.90	274.64	830.82	11486.23	2632.97	1950.12
PVA(A-B)	3111.59	1862.00	3688.50	2386.60	614.30	698.75	910.00	17017.28	9225.22	1429.08
SVA(E-F)	6462.38	3339.24	3925.37	4493.04	1523.41	685.07	1025.36	18012.18	6265.79	2611.93
OUTPUT TRANSFER	-3419.56	-1479.63	-236.57	-2102.88	-924.65	-1.20	-123.42	-1286.62	2822.93	-1216.79
INPUT TRANSFER	-68.77	-2.40	0.31	3.56	-15.54	-14.88	-8.06	-291.73	-136.51	-33.94
FACTOR TRANSFER	39.10	-28.18	-310.56	-21.40	13.64	14.79	49.26	-340.08	1479.81	-250.17
NET TRANSFER	-3389.90	-1449.06	73.69	-2085.03	-922.75	-1.11	-164.62	-654.81	1479.63	-932.69
PCR (C/A-B)	0.69	0.89	0.26	0.53	0.64	0.61	0.27	0.36	0.55	0.29
DRC(G/E-F)	0.33	0.50	0.32	0.29	0.25	0.60	0.19	0.36	0.58	0.25
NPCo(A/E)	0.54	0.57	0.94	0.55	0.45	1.00	0.90	0.95	1.32	0.57
NPCi (B/F)	0.93	0.98	1.03	1.03	0.90	0.93	0.97	0.95	0.95	0.83
PC (D/H)	0.22	0.13	1.03	0.35	0.19	1.00	0.80	0.94	1.56	0.52
EPC{(A-B)/(E-F)}	0.48	0.56	0.94	.53	0.40	1.02	0.89	0.94	1.47	0.55
MTD{(D-H)/(E-F)}	-0.52	-0.43	0.02	-0.46	-0.61	0.00	-0.16	-0.04	0.24	-0.36

respectively. Lebanon is a net exporter of tobacco, the production of tobacco is profitable at both private and social prices. This crop also enjoys an effective protection of 67-per cent. This crop is produced with relative efficiency and the country enjoys some comparative advantage in its production. The production of tobacco is also sustainable without effective production, but with a low margin of profit. In addition to some social considerations, this crop was also recently introduced as a replacement to illicit crops in the Bekaa valley with high support prices.

Cucumber is largely grown in the North, Mount Lebanon, the South and the Bekaa valley each sharing 39, 28, and 17 percent of local production. This crop is also profitable at both private and social prices. However, it is negatively protected. Cucumber is produced with a high level of efficiency and Lebanon enjoys a significant comparative advantage in its production. With the removal of the negative protection, the potential for the expansion of this crop could further be exploited.

Eggplant is largely produced in the North and the Bekaa, each sharing 41 and 36 per cent of local production. Mount Lebanon, the South and Nabatiyeh, each shares the remaining 15, 3, and 5 per cent of local production. This crop is also profitable at both private and social prices, nevertheless, eggplant production is negatively protected. On the other hand, Lebanon enjoys a significant comparative advantage in the production of eggplant. The crop is produced with a high level of efficiency and it has a real potential for further expansion.

Squash is largely produced in the North and the Bekaa, each sharing 62 and 27 per cent of local production. Mount Lebanon and the South share the remaining 8 and 3 per cent of local production respectively. The production of squash is also profitable at both private and social prices, however, it is negatively protected. Lebanon has a good comparative advantage in the production of squash and it is produced with a high level of efficiency, thus the potential for its further expansion is real.

Melon is grown to a large extent in the North and Bekaa, sharing 61 and 36 per cent of local production respectively. Very small quantities of melon are also produced in the South and Nabatiyeh with 2 and 1 per cent respectively. The production of melon is profitable at both private and social prices. This crop is also negatively protected. Nevertheless, melon is produced with a high level of efficiency and the potential for its expression is significant.

Watermelon is produced in the Bekaa (96 per cent), the North (2 per cent), the South (1 per cent) and Nabatiyeh (1 per cent). The production of watermelon is profitable at both private and social prices, however, currently this crop is negatively protected. Watermelon is produced with a high level of efficiency and the potential for its expansion is also significant. Lebanon has a strong comparative advantage in watermelon production (Table 21).

Avocado is considered as an important substitutable crop and Lebanon is a net importer of avocado. The production of avocado is profitable at both social and private prices, nonetheless, this crop is also negatively protected. Avocado is produced with relative efficiency, and it has a good potential for further expansion.

The following crops in addition to satisfying local needs are also exported in large quantities.

Strawberries are produced in Mount Lebanon, the South and the North, sharing 89, 6, and 4 per cent respectively of the total production. This crop is profitable at both private and social prices, it is negatively protected. Strawberries are also produced with a high level of efficiency and the potential for their expansion exists. Lebanon enjoys a great comparative advantage in the production of strawberries (Table 21).

Apple is one of the main export crop of Lebanon. It is mainly produced in the North, Bekaa and Mount Lebanon 53, 26, and 19 per cent respectively. The production of apple is profitable at both private and social prices. This crop is negatively protected. However, apple is produced with a high level of efficiency and the prospects for its expansion are good, subject to market demand. Lebanon enjoys a good comparative advantage in apples production.

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Banana is mainly grown in the South and Mount Lebanon, at a share of 88 and 11 per cent respectively. This crop is also profitable at both private and social prices and it enjoys a positive protection due to the restrictions on its import stipulated in the "Agricultural Calendar". The crop is grown both in the open fields as well as in the greenhouses. Banana is produced with a relative efficiency and the prospect for its expansion is good. Lebanon has a comparative advantage in banana production.

Pears are largely grown in the North (61 per cent), Bekaa (23 per cent) and Mount Lebanon (31 per cent). The production of pear is also profitable at both private and social prices, this crop is negatively protected. Pears are produced with a high level of efficiency and the potential for its further expansion is great. Lebanon enjoys a significant comparative advantage in pears production.

Lebanon produces two varieties of grapes, industrial and table grapes. Industrial grapes are largely grown in the Bekaa and the North (59 and 27 per cent respectively). The South and Mount Lebanon also produce small quantity of this variety of grapes (8 and 6 per cent respectively). Seventy-one per cent of table grapes are mainly produced in Bekaa, and the remaining 29 per cent is shared by Mount Lebanon, the North, the South and Nabatiyeh, (12, 6, 6, and 5 percent respectively). The production of grapes is profitable at both private and social prices. Grapes are negatively protected. This crop is produced with a high level of efficiency and the prospect for its expansion is great. Lebanon enjoys a good comparative advantage in grapes production.

Citrus is also one of the most important export crops in Lebanon. It is largely produced in the South and North (63 and 24 percent respectively). The remaining 13 per cent is shared by Nabatiyeh and Mount Lebanon (10 and 3 per cent respectively). The production of citrus is also profitable at both private and social prices. Currently, this crop is negatively protected. However, Lebanon has a significant comparative advantage in the production of citrus which is produced with a high level of efficiency. The prospect for the expansion of this crop is good, subject to demand constraints.

Olives are grown largely in the North, Nabatiyeh and the South (41, 24, and 19 per cent respectively). Mount Lebanon and Bekaa each produce 10 and 6 per cent respectively. Olive is profitable at both private and social prices and it does not enjoy any effective protection. Lebanon is relatively efficient in the production of olives and it does enjoy a comparative advantage. The potential for the expansion of olives does exist in Lebanon.

Potatoes are mainly produced in the Bekaa, the North and Mount Lebanon, at 81, 18, and 1 per cent respectively. Lebanon is a net exporter of potatoes. The production of potatoes is profitable at both private and social prices. This crop is negatively protected, however, Lebanon has a comparative advantage in the production of potatoes and this crop is produced with relative efficiency. Potatoes have a good potential for further expansion.

Bekaa and the North are the major producing regions of carrots, each sharing 54 and 38 per cent respectively. Small quantities of carrots are also produced in Mount Lebanon, the South and Nabatiyeh, at 4, 3, and 1 per cent respectively. The production of carrots is currently profitable at both social and private prices. This crop is negatively protected, however, the country has a great comparative advantage in the production of carrots. The crop is produced with high efficiency and the prospect for its production expansion is good.

Lebanon also produces large quantities of tomatoes for local consumption and export as well. Mount Lebanon and Bekaa are the major producing region of tomatoes. Each sharing 51 and 28 per cent of local production respectively. The North, the South and Nabatiyeh, respectively share 10, 9, and 2 per cent of the local production. Like most other crops in this category, the production of tomatoes is profitable at both private and social prices and with no exception this crop is likewise negatively protected. Lebanon enjoys a significant comparative advantage in the production of tomatoes and this crop is currently produced with a high level of efficiency. Further expansion of this crop, subject to demand constraints is viable.

Zone 1 is dominant with two major export crops, namely apples and pears (Table 22). The production of apples produced in Zone 1 is generally profitable at both private and social prices with the exception of Kurtaba, Fakra, and Hrajel, where production at private price is not profitable. The production of all pears, on the other hand, is profitable, at both private and social prices. With the exception of apples in Fakra, all other apples and pears grown in Zone 1 enjoy comparative advantage in production indicating a good level of efficiency. On the incentive side, most of these crops are negatively protected, meaning that the private prices received by the producers of these crops are far below their comparable export parity prices at farmgate level. As a result, social profits are significantly higher than the private profits for these crops. The high interest rates, and the overhead exchange rate in this context are working against the interest of farmers and creating wider divergences between actual and optimal social prices. This further reduces the incentives for fully exploit the production potentials.

A wide assortment of crops is produced in Zone 2 (Table 23). All the crops in Zone 2 are profitable at private and social prices with the exception of tobacco which is not profitable at social prices. However, social profits are significantly higher than the private profits, again implying that social prices are much higher than the prices received by farmers with the exception of wheat and tobacco, where farmers receive much higher prices due to effective protection, while all other crops grown in Zone 2 are negatively protected. All crops grown in Zone 2, with the exception of tobacco are produced with high level of efficiency and the zone enjoys a good comparative advantage in the production. The current incentive structure is not conducive to the realization of a full production potential in Zone 2.

Zone 3 is dominant by 3 crops namely olives, cucumbers, and tomatoes (Table 24). Olives are produced efficiently and the zone enjoys a comparative advantage in the production of olives. The production of olives is profitable at both private and social prices, but the social profit is significantly higher. This is due to the negative protection accorded to the production of olives in this zone. The production of tomatoes and cucumbers also enjoys a good comparative advantage with the exception of cucumbers in Sebael which is relatively less efficient due to both negative profits at both social and private prices. The private profit for cucumbers in Anfeh and Zgharta is also negative due to negative effective protection. The majority of the crops produced in Zone 3 are negatively protected with the exception of tomatoes in Sebael. This again leaves little incentives for further expansion in production.

With the exception of cucumbers and tomatoes in Amchit all other crops grown in Zone 4 are profitable at both private and social prices (Table 25). All the crops in this zone enjoy a good comparative advantage and a relative efficiency in production. The majority of the crops grown in this zone are negatively protected but some enjoy a positive protection. This positive protection to a large extent is the result of the "Agricultural Calendar" which restricts the importation of certain crops to Lebanon. The prospect for further expansion of the production in Zone 4 is good provided some remedial action is enacted to remove the distortion between the private and social prices.

Zone 5 is known for the production of quality citrus fruits (Table 26). All citrus with the exception of oranges are profitable at both private and social prices. All citrus are produced with considerable efficiency and the zone enjoys a good comparative advantage in the production of citrus. This comparative advantage in production is not equally matched with the incentive structure, since the crops on the contrary suffer from negative effective protection. This zone also enjoys a comparative advantage in the production of bananas. All bananas, with the exception of Sour are profitable at both private and social prices and enjoy a good comparative advantage in production. Zone 5 has a good potential for further expansion.

All crops grown in Zone 6 are profitable at private prices with the exception of table grapes and potatoes (Table 27). Similarly, all crops grown in this zone are highly profitable at social prices with the exception of sugarbeet and wheat. All crops grown in this zone enjoy a good comparative advantage in production with the exception of sugarbeet and wheat. Moreover, all crops grown in this zone suffer from negative effective protection in contrast to sugarbeet and wheat that both enjoy a positive effective protection. There is an apparent contradiction in the pursuit of a policy where crops with a good comparative advantage are actually taxed by the incentive structure while those with no comparative advantage in

production are heavily supported. On the one hand, inefficient crops are produced with a high support price while on the other hand efficient crops are negatively protected which discourages their expansion. Again due to divergence in prices, social profits are significantly larger than their private counterparts.

All crops grown in Zone 7 are profitable at private prices with the exception of grapes and potatoes (Table 28). Similarly, all crops grown in this zone are highly profitable at social prices with the exception of sugarbeet and wheat. Likewise, all crops grown in Zone 7 enjoy efficiency in production and a good comparative advantage with the exception of grapes, sugarbeet and tobacco where the zone does not have any comparative advantage. Again, sugarbeet and wheat are produced with high support prices and without which the production of these crops is not sustainable. All other crops grown in Zone 7 suffer from negative protection.

Zone 8 is dominant by the production of melon, watermelon, and tomatoes (Table 29). The production of all these crops is profitable at private prices but even highly profitable at social prices. These crops are produced with a high level of efficiency and enjoy a good comparative advantage in production. Again here, the incentive structure is not compatible with the level of efficiency and it actually discourages efficient production as in most case the crops suffer from negative effective protection. Efficient use of resources and further exploiting the potential of these crops will at least call for a neutral incentive structure.

Zone 9 is dominated by the production of olives, tobacco and wheat (Table 30). All crops grown in this zone are profitable in private prices with the exception of wheat in Ghasanieh. Similarly, all crops grown in Zone 9 are profitable in social prices with the exception of tobacco in Bent -Jbeil and wheat in Ghasanieh. Again all crops grown in this zone are efficiently produced and enjoy a good comparative advantage with the exception of tobacco in Bent-Jbeil and wheat in Ghasanieh. Most of the crops grown in Zone 9 also benefit from a positive effective protection.

Table ... (Akkar, Bcharre, Ehden, Bcharre, Hasroun, Tannourine, Jezzine, Kesrouan and Chouf)
(in Lebanese Pounds)

Items	Apple Kurtuba	Apple Kfardebian	Apple Faria	Apple Akkar	Apple Ehden	Apple Fakra	Apple Hrajel	Apple Fnaidek	Pears Akkar	Pears Fnaidek	Pears Hasroun
Private Profit (D=A-B-C)	-454,900	667,850	-143,400	293,850	169,500	-478,000	-388,750	260,950	411,350	674,750	344,795
Social Profit (H=E-F-G)	41,582	2,719,044	659,416	2,097,246	1,817,890	-176,016	1,112,910	2,139,531	736,864	834,642	652,617
Private Value Added (A-B)	309,000	1,978,000	551,000	616,500	537,500	419,500	805,000	640,000	694,000	940,000	713,300
Social Value Added (E-F)	820,119	4,064,647	1,409,638	2,360,433	2,095,320	740,723	2,352,545	2,443,878	978,736	1,048,954	997,715
Output Transfer (I=A-E)	-534,306	-2,137,225	-904,890	-1,756,846	-1,568,613	-393,668	-1,582,335	-1,819,591	-296,928	-123,424	-296,928
Input Transfer (J=B-F)	-23,187	-50,578	-46,252	-12,913	-10,792	-72,445	-34,790	-15,712	-12,192	-14,470	-12,513
Factor Transfer (K=C-G)	-14,637	-35,453	-55,822	59,463	90,569	-19,239	-45,885	74,703	40,778	50,938	23,406
Net Transfer (L=D-H)	-496,482	-2,051,194	-802,816	-1,803,396	-1,648,390	-301,984	-1,501,660	-1,878,581	-325,514	-159,892	-307,822
PCR (C/(A-B))	2.47	0.66	1.26	0.52	0.68	2.14	1.48	0.59	0.41	0.28	0.52
DRC (G/(E-F))	0.95	0.33	0.53	0.11	0.13	1.24	0.53	0.12	0.25	0.20	0.35
NPCo (A/E)	0.54	0.54	0.51	0.32	0.32	0.72	0.43	0.32	0.75	0.90	0.75
NPCi (B/F)	0.93	0.91	0.90	0.95	0.95	0.89	0.92	0.94	0.94	0.93	0.94
PC (D/H)	-10.94	0.25	-0.22	0.14	0.09	2.72	-0.35	0.12	0.56	0.81	0.53
EPC ((A-B)/(E-F))	0.38	0.49	0.39	0.26	0.26	0.57	0.34	0.26	0.71	0.90	0.71
MTD ((D-H)/(E-F))	-0.61	-0.50	-0.57	-0.76	-0.79	-0.41	-0.64	-0.77	-0.33	-0.15	-0.31

Table 23: Zone 2 (Akkar and Minieh Coast)
(in Lebanese Pounds)

Items	Carrots Akkar Plain	Orange Minieh	Orange Coastal Akkar	Valencia Coastal Akkar	Cucumber Minieh	Eggplant Akkar Plain	Grapes Akkar Plain	Potato Coastal Akkar	Squash Minieh	Tobacco Coastal Akkar	Tomato Minieh GH	Wheat Akkar Plain
Private Profit (D=A-B-C)	254,840	485,870	93,135	1,130,801	6,167,355	42,000	5,524,400	61,380	270,750	240,280	4,893,600	195,760
Social Profit (H=E-F-G)	1,153,700	2,936,934	2,786,383	3,384,521	9,387,607	3,537,598	1,974,551	160,128	901,253	-473,517	6,257,890	80,753
Private Value Added (A-B)	708,500	1,281,150	856,500	2,066,060	8,149,900	705,000	5,887,000	439,430	1,045,000	828,500	6,997,000	326,500
Social Value Added (E-F)	1,531,804	3,860,709	3,881,792	4,523,162	11,464,210	4,011,083	2,325,791	548,648	1,626,280	154,663	8,413,791	208,629
Output Transfer (I=A-E)	-839,895	-2,592,535	-3,042,603	-2,478,083	-3,387,696	-3,326,310	3,549,845	-125,940	-609,935	667,822	-1,478,131	107,174
Input Transfer (J=B-F)	-16,591	-12,976	-17,311	-20,981	-73,386	-20,226	-11,364	-16,722	-28,655	-6,015	-61,339	-10,697
Factor Transfer (K=C-G)	75,555	-128,495	-332,044	-203,382	-94,058	189,515	11,360	-10,470	49,223	-39,960	-52,501	2,864
Net Transfer (L=D-H)	-898,860	-2,451,064	-2,693,248	-2,253,720	-3,220,252	-3,495,598	3,549,849	-98,748	-630,503	713,797	-1,364,290	115,007
PCR (C/(A-B))	0.64	0.62	0.89	0.45	0.24	0.94	0.06	0.86	0.74	0.71	0.30	0.40
DRC (G/(E-F))	0.25	0.24	0.28	0.25	0.18	0.12	0.15	0.71	0.45	4.06	0.26	0.61
NPCo (A/E)	0.51	0.36	0.27	0.50	0.75	0.30	2.45	0.87	0.71	2.75	0.86	1.36
NPCi (B/F)	0.91	0.94	0.94	0.95	0.96	0.97	0.91	0.96	0.94	0.97	0.97	0.88
PC (D/H)	0.22	0.17	0.03	0.33	0.66	0.01	2.80	0.38	0.30	-0.51	0.78	2.42
EPC ((A-B)/(E-F))	0.46	0.33	0.22	0.46	0.71	0.18	2.53	0.80	0.64	5.36	0.83	1.56
MTD ((D-H)/(E-F))	-0.59	-0.63	-0.69	-0.50	-0.28	-0.87	1.53	-0.18	-0.39	4.62	-0.16	0.55

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Table 24: Zone 3 (Zgharta Coast and Koura)
(in Lebanese Pounds)

Items	Cucumber Sebael GH	Cucumber Anfeh GH	Cucumber Zghorta GH	Olives Koura	Tomato Anfeh GH	Tomato Zghorta GH	Tomato Sebael GH
Private Profit (D=A-B-C)	-3,188,525	-2,001,825	-1,540,820	139,425	4,179,150	2,822,200	775,160
Social Profit (H=E-F-G)	-166,110	1,452,810	1,395,112	243,202	5,852,270	5,229,652	603,109
Private Value Added (A-B)	1,625,500	1,935,000	3,645,100	416,700	8,106,000	7,345,000	5,013,500
Social Value Added (E-F)	4,270,234	4,601,146	5,635,624	509,257	9,750,422	8,826,542	3,813,267
Output Transfer (I=A-E)	-2,693,848	-2,693,848	-2,032,618	-105,838	-1,689,292	-1,520,363	1,155,354
Input Transfer (J=B-F)	-49,114	-27,702	-42,094	-13,281	-44,870	-38,821	-44,879
Factor Transfer (K=C-G)	377,682	788,489	945,409	11,220	28,698	925,910	1,028,183
Net Transfer (L=D-H)	-3,022,415	-3,454,635	-2,935,932	-103,777	-1,673,120	-2,407,452	172,051
PCR (C/(A-B))	2.96	2.03	1.42	0.67	0.48	0.62	0.85
DRC (G/(E-F))	1.04	0.68	0.75	0.52	0.40	0.41	0.84
NPCo (A/E)	0.60	0.60	0.75	0.83	0.86	0.86	1.20
NPCi (B/F)	0.98	0.99	0.98	0.89	0.98	0.98	0.98
PC (D/H)	19.20	-1.38	-1.10	0.57	0.71	0.54	1.29
EPC ((A-B)/(E-F))	0.38	0.42	0.65	0.82	0.83	0.83	1.31
MTD ((D-H)/(E-F))	-0.71	-0.75	-0.52	-0.20	-0.17	-0.27	0.05

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Table 25: Zone 4 (Kesrouan, Metn, Baabda, Aley, Costal Plain of Chouf, Batrou and Jbeil) (in Lebanese Pounds)

Items	Cucumber Amchit GH	Cucumber Jbeil GH	Cucumber Jieh GH	Olives Chouf	Strawberry Cheweifat GH	Strawberry Batroun GH	Tomato Jbeil GH	Tomato Amchit GH	Tomato Halat GH	Tomato Saideyat GH	Tomato Cheweifat GH	Tomato Jadra GH	Tomato Naameh GH
Private Profit (D=A-B-C)	-642,487	1,469,520	2,144,450	942,000	6,290,070	11,768,645	1,690,515	-1,046,450	4,787,330	5,961,550	2,209,650	2,401,775	1,341,100
Social Profit (H=E-F-G)	1,855,646	4,135,406	2,545,235	364,807	3,173,878	12,451,464	4,765,970	459,211	5,967,290	1,543,235	2,114,966	3,883,297	1,352,981
Private Value Added (A-B)	1,858,500	3,850,310	5,365,750	1,460,000	14,344,000	18,457,600	4,926,450	1,561,050	8,005,700	10,304,000	6,511,000	6,164,000	5,373,000
Social Value Added (E-F)	4,304,689	6,541,268	5,265,494	866,007	11,013,617	19,379,164	7,117,859	3,003,188	9,459,961	5,816,469	6,220,749	7,378,832	5,126,588
Output Transfer (I=A-E)	-2,478,340	-2,722,002	66,091	568,563	2,871,050	-1,286,620	-2,232,504	-1,475,717	-1,482,354	4,417,496	233,031	-1,266,969	194,193
Input Transfer (J=B-F)	-32,152	-31,045	-34,165	-25,430	-459,333	-365,056	-41,095	-33,578	-28,092	-70,035	-57,220	-52,137	-52,219
Factor Transfer (K=C-G)	51,945	-25,072	501,041	16,800	214,191	-238,745	884,046	63,522	-274,301	69,216	195,567	266,690	258,293
Net Transfer (L=D-H)	-2,498,133	-2,665,886	-400,785	577,193	3,116,192	-682,819	-3,075,455	-1,505,661	-1,179,960	4,418,315	94,684	-1,481,522	-11,881
PCR (C/(A-B))	1.35	0.62	0.60	0.35	0.56	0.36	0.66	1.67	0.40	0.42	0.66	0.61	0.75
DRC (G/(E-F))	0.57	0.37	0.52	0.58	0.71	0.36	0.33	0.85	0.37	0.73	0.66	0.47	0.74
NPCo (A/E)	0.60	0.69	1.01	1.53	1.16	0.95	0.73	0.68	0.86	1.54	1.03	0.86	1.03
NPCi (B/F)	0.98	0.99	0.99	0.88	0.94	0.92	0.96	0.98	0.96	0.97	0.98	0.96	0.98
PC (D/H)	-0.35	0.36	0.84	2.58	1.98	0.95	0.35	-2.28	0.80	3.86	1.04	0.62	0.99
EPC ((A-B)/(E-F))	0.43	0.59	1.02	1.69	1.30	0.95	0.69	0.52	0.85	1.77	1.05	0.84	1.05
MTD ((D-H)/(E-F))	-0.58	-0.41	-0.08	0.67	0.28	-0.04	-0.43	-0.50	-0.12	0.76	0.02	-0.20	0.00

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Table 26: Zone 5 (Coastal Saida and Sour)
(in Lebanese Pounds)

Items	Avocado Ghazieh	Banana Aboaloussoud	Banana Akabieh	Banana Zahrani	Banana Sour	Valencia Aboulossoud	Valencia Brak	Valencia Ansariyeh	Valencia Sour	Lemon Ghazieh	Orange Brak	Orange Sour	Cucumber Zahrani GH	Tomato Zahrani GH
Private Profit (D=A-B-C)	412,050	1,310,700	1,466,510	643,850	-969,610	1,232,225	378,810	1,043,465	27,562	70,750	6,400	-493,685	833,925	1,507,880
Social Profit (II=E-F-G)	1,832,006	1,274,731	1,448,059	1,202,303	-685,919	3,341,239	2,616,721	4,247,910	1,553,567	1,748,456	1,339,370	1,452,035	4,609,252	3,664,281
Private Value Added (A-B)	1,826,000	3,412,500	3,109,250	2,042,000	591,600	2,362,000	1,726,750	2,150,140	992,452	1,295,000	1,587,000	774,600	2,910,000	4,029,500
Social Value Added (E-F)	3,289,868	3,620,445	3,301,808	2,808,353	878,467	4,461,498	4,115,243	5,467,267	2,624,303	3,085,984	3,076,242	2,854,999	6,693,923	6,216,690
Output Transfer (I=A-E)	-1,479,632	-255,749	-223,780	-791,812	-343,118	-2,102,877	-2,402,740	-3,322,827	-1,641,287	-1,802,055	-1,502,055	-2,102,055	-3,827,002	-2,213,575
Input Transfer (J=B-F)	-15,765	-47,804	-31,222	-25,459	-56,252	-3,380	-14,248	-5,699	-9,435	-11,071	-12,813	-21,656	-43,079	-26,385
Factor Transfer (K=C-G)	-43,912	-243,914	-211,009	-207,900	-3,176	9,517	-150,581	-112,682	-105,846	-113,278	-156,272	-134,679	-8,596	-30,789
Net Transfer (L=D-H)	-1,419,956	35,969	18,451	-558,453	-283,691	-2,109,014	-2,237,911	-3,204,445	-1,526,005	-1,677,706	-1,332,970	-1,945,720	-3,775,327	-2,156,401
PCR (C/(A-B))	0.77	0.62	0.53	0.68	2.64	0.48	0.78	0.51	0.97	0.95	1.00	1.64	0.71	0.63
DRC (G/(E-F))	0.44	0.65	0.56	0.57	1.78	0.25	0.36	0.22	0.41	0.43	0.56	0.49	0.31	0.41
NPCo (A/E)	0.57	0.94	0.94	0.75	0.75	0.55	0.45	0.40	0.41	0.45	0.55	0.36	0.56	0.68
NPCi (B/F)	0.92	0.92	0.93	0.93	0.89	0.98	0.95	0.94	0.94	0.95	0.94	0.95	0.98	0.97
PC (D/H)	0.22	1.03	1.01	0.54	1.41	0.37	0.14	0.25	0.02	0.04	0.00	-0.34	0.18	0.41
EPC ((A-B)/(E-F))	0.56	0.94	0.94	0.73	0.67	0.53	0.42	0.39	0.38	0.42	0.52	0.27	0.43	0.65
MTD ((D-II)/(E-F))	-0.43	0.01	0.01	-0.20	-0.32	-0.47	-0.54	-0.59	-0.58	-0.54	-0.43	-0.68	-0.56	-0.35

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Table 27: Zone 6 (Zahle and West Bekaa)
(in Lebanese Pounds)

Items	Apple Bekaa	Cucumber Bekaa GH	Grapes Bekaa Processing	Grapes Bekaa Table	Melon Bekaa Irrigated	Potato Bekaa Irrigated	Sugarbeet Bekaa Irrigated	Tomato Bekaa Irrigated	Watermelon Bekaa Irrigated	Wheat Bekaa Rainfed
Private Profit (D=A-B-C)	391,250	4,714,000	209,900	-145,825	88,025	-68,820	38,470	630,950	54,350	56,210
Social Profit (H=E-F-G)	3,209,485	13,209,480	1,129,830	807,891	2,183,286	181,419	-46,471	2,759,129	2,020,879	-4,339
Private Value Added (A-B)	1,558,000	6,732,500	607,000	516,500	771,000	397,700	613,500	1,369,000	445,000	110,000
Social Value Added (E-F)	4,160,120	15,293,212	1,511,970	1,408,689	2,900,525	682,101	400,100	3,548,039	2,432,505	49,973
Output Transfer (I=A-E)	-2,637,225	-8,609,620	-924,651	-924,651	-2,166,079	-307,425	169,398	-2,275,717	-2,016,794	47,633
Input Transfer (J=B-F)	-35,105	-48,908	-19,681	-32,462	-36,554	-23,024	-44,002	-96,678	-29,290	-12,393
Factor Transfer (K=C-G)	216,115	-65,232	14,960	61,528	-34,264	-34,161	128,459	-50,860	-20,976	-523
Net Transfer (L=D-H)	-2,818,235	-8,495,480	-919,930	-953,716	-2,095,261	-250,239	84,941	-2,128,179	-1,966,529	60,549
PCR (C/(A-B))	0.75	0.30	0.65	1.28	0.89	1.17	0.94	0.54	0.88	0.49
DRC (G/(E-F))	0.23	0.14	0.25	0.43	0.25	0.73	1.12	0.22	0.17	1.09
NPCo (A/E)	0.43	0.49	0.45	0.45	0.36	0.75	1.21	0.51	0.28	1.36
NPCi (B/F)	0.93	0.97	0.88	0.88	0.92	0.96	0.89	0.91	0.92	0.85
PC (D/H)	0.12	0.36	0.19	-0.18	0.04	-0.38	-0.83	0.23	0.03	-12.95
EPC ((A-B)/(E-F))	0.37	0.44	0.40	0.37	0.27	0.58	1.53	0.39	0.18	2.20
MTD ((D-H)/(E-F))	-0.68	-0.56	-0.61	-0.68	-0.72	-0.37	0.21	-0.60	-0.81	1.21

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Table 28: Zone 7 (Baalbeck)
(in Lebanese Pounds)

Items	Apple Ainata	Apple Yamouneh	Apple Baalbeck	Cucumber Brital GH	Cucumber Kafardan GH	Grapes Baalbeck	Potato Baalbeck Irrigated	Sugarbeet Baalbeck Irrigated	Tobacco Rasmelhadeth Irrigated	Potato Majdaloun
Private Profit (D=A-B-C)	1,246,100	131,000	160,900	3,799,000	758,760	-533,525	-230,630	228,840	355,410	-163,665
Social Profit (H=E-F-G)	2,466,256	694,965	901,264	10,433,640	8,094,943	-117,819	305,869	-269,182	-409,669	118,581
Private Value Added (A-B)	2,154,000	1,100,000	1,171,000	7,211,000	4,480,500	268,500	172,000	777,000	866,000	199,300
Social Value Added (E-F)	3,427,332	1,622,892	1,890,620	13,759,723	11,823,368	680,597	832,872	601,629	137,138	564,254
Output Transfer (I=A-E)	-1,309,780	-554,890	-753,124	-6,734,620	-7,387,696	-424,826	-688,415	163,045	727,016	-381,188
Input Transfer (J=B-F)	-36,448	-31,998	-33,504	-185,897	-44,828	-12,729	-27,543	-12,326	-1,846	-16,234
Factor Transfer (K=C-G)	-53,176	41,073	20,744	85,917	-6,685	3,609	-124,373	-322,650	-36,217	-82,708
Net Transfer (L=D-H)	-1,220,156	-563,965	-740,364	-6,634,640	-7,336,183	-415,706	-536,499	498,022	765,079	-282,246
PCR (C/(A-B))	0.42	0.88	0.86	0.47	0.83	2.99	2.34	0.71	0.59	1.82
DRC (G/(E-F))	0.28	0.57	0.52	0.24	0.32	1.17	0.63	1.45	3.99	0.79
NPCo (A/E)	0.65	0.70	0.65	0.60	0.45	0.49	0.50	1.21	3.66	0.62
NPCi (B/F)	0.87	0.86	0.86	0.94	0.97	0.92	0.95	0.92	0.99	0.96
PC (D/H)	0.51	0.19	0.18	0.36	0.09	4.53	-0.75	-0.85	-0.87	-1.38
EPC ((A-B)/(E-F))	0.63	0.68	0.62	0.52	0.38	0.39	0.21	1.29	6.31	0.35
MTD ((D-H)/(E-F))	-0.36	-0.35	-0.39	-0.48	-0.62	-0.61	-0.64	0.83	5.58	-0.50

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Table 29: Zone 8 (Qaa and Hermel)
(in Lebanese Pounds)

Items	Melon Qaa Irrigated	Tomato Qaa Irrigated	Watermelon Qaa Irrigated	Watermelon Qaa Tunnels
Private Profit (D=A-B-C)	324,700	846,125	387,525	956,025
Social Profit (H=E-F-G)	1,697,178	3,590,027	1,963,143	1,918,590
Private Value Added (A-B)	691,000	1,306,000	828,000	1,412,000
Social Value Added (E-F)	2,298,984	4,364,050	2,630,144	2,610,691
Output Transfer (I=A-E)	-1,624,559	-3,075,717	-1,816,794	-1,216,794
Input Transfer (J=B-F)	-16,575	-17,667	-14,651	-18,104
Factor Transfer (K=C-G)	-235,506	-314,148	-226,526	-236,126
Net Transfer (L=D-H)	-1,372,478	-2,743,902	-1,575,618	-962,565
PCR (C/(A-B))	0.53	0.35	0.53	0.32
DRC (G/(E-F))	0.26	0.18	0.25	0.27
NPCo (A/E)	0.36	0.34	0.36	0.57
NPCi (B/F)	0.93	0.94	0.92	0.91
PC (D/H)	0.19	0.24	0.20	0.50
EPC ((A-B)/(E-F))	0.30	0.30	0.31	0.54
MTD ((D-H)/(E-F))	-0.60	-0.63	-0.60	-0.37

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Table 30: Zone 9 (Nabatiyeh and Marjayoun)
(in Lebanese Pounds)

Items	Olives Kferhata	Olives Nabatiyeh	Tobacco Adehit	Tobacco Elerez	Tobacco Bent-Jebeil	Wheat Ghasanieh	Wheat Nabatiyeh
Private Profit (D=A-B-C)	1,546,250	1,134,750	687,280	582,437	108,660	-95,150	101,300
Social Profit (H=E-F-G)	2,001,845	320,117	207,739	113,918	-178,664	-130,543	11,147
Private Value Added (A-B)	2,040,000	1,532,500	1,365,000	1,335,000	765,000	111,750	166,600
Social Value Added (E-F)	2,474,595	706,467	833,372	803,762	441,090	46,517	72,367
Output Transfer (I=A-E)	-453,593	806,362	526,706	526,706	316,024	50,610	74,784
Input Transfer (J=B-F)	-18,997	-19,670	-4,922	-4,532	-7,886	-14,623	-19,449
Factor Transfer (K=C-G)	21,000	11,400	52,087	62,719	36,586	29,840	4,080
Net Transfer (L=D-H)	-455,595	814,633	479,541	468,519	287,324	35,393	90,153
PCR (C/(A-B))	0.24	0.26	0.50	0.56	0.86	1.85	0.39
DRC (G/(E-F))	0.19	0.55	0.75	0.86	1.41	3.81	0.85
PCo (A/E)	0.83	1.94	1.54	1.54	1.54	1.36	1.36
NPCi (B/F)	0.92	0.87	0.96	0.97	0.94	0.84	0.86
C (D/H)	0.77	3.54	3.31	5.11	-0.61	0.73	9.09
EPC ((A-B)/(E-F))	0.82	2.17	1.64	1.66	1.73	2.40	2.30
MTD ((D-H)/(E-F))	-0.18	1.15	0.58	0.58	0.65	0.76	1.25

VII. CONCLUSIONS

Agriculture in Lebanon is not a major or significant burden on the government. The Lebanese government has typically allocated a very small proportion of its budget to agriculture. It has introduced, however, the "Agricultural Calendar" which has been designed to protect particular crops during the harvest season and has advanced cash subsidies to products such as tobacco and sugarbeet to convince farmers to move off illicit products in certain zones into more acceptable crops. But these efforts are marginal and do not represent major distortions to the sector. The distortions, however, came from the macroeconomic policy that targeted an over-valued exchange rate, which necessitated very high interest rates. It also comes from the way water is priced and distributed. Water is now used at prices that are significantly below its marginal cost of production and a typical scarcity premium. There are also high tariff rates on imported inputs and domestic output prices are fractions of the comparable border prices.

Government policy in Lebanon is committed to free enterprise. The government intervenes very marginally in market outcomes. The tax rates are exceptionally low by comparison to any other country and rates of collection are even lower. The government restricted its intervention to building infrastructure. This has not been sufficient, and still there are insufficient rural roads. The Lebanese market is not well insulated for Lebanese farmers. The export potential is there but the over-valued exchange rate and the typical neglect of consistent and effective marketing partnerships between the private and public sectors are increasingly forfeiting it.

While this study deals with microeconomic issues in the agricultural sector, it also points out the many ways the macroeconomic environment impacts on the performance of farmers and farms. It is clear that 22 percent depreciation in the value of the Lebanese pounds will help immensely the capacity of the agricultural sector to become more profitable and efficient. With this, there is also a need for a more realistic interest rate, which will encourage investment in farming. Lack of credit is a major constraint against the development of agriculture in Lebanon and any action to remove this constraint will be highly beneficial to expanding farming. Water need to be priced at its shadow price. Lebanon is relatively well endowed with water. But this water needs to be conserved and its quality preserved. There is no room for misuse of resources and efficiency calls for limiting misuse of resources and for an appropriate price regime. Lebanon can and must seek efficient allocation of resources and exploit its comparative advantage. Other social objectives may be necessary but the cost and benefits of these should be clearly and objectively determined.

The results suggest that there are a number of agricultural products (fruits, vegetables, and potatoes) where Lebanon has a comparative advantage. However, there are a few cases where the subsidies are sustaining economically inefficient outputs. This is particularly true for tobacco, wheat and sugarbeet. High subsidies encourage inefficiency by supporting the production of crops in which the country is less competitive. Such policy framework is less conducive to the efficient use of resources. Special studies and care should be directed towards validating these preliminary findings.

The analysis focused on the impact of policies as well as market failures on the competitiveness and efficiency of major crops grown in Lebanon. Policy impacts and other divergences were evaluated through the policy analysis matrix (PAM). The results showed that farming is a profitable business in Lebanon. Review of protection coefficients reveals that most of the crops in Lebanon are negatively protected. Distortions whether generated by either direct or indirect policy interventions are not conducive to the development of productive and efficient resource use and sustainable growth of the agricultural sector. In the long run it may lead to resource misallocation.

Lebanon has a significant comparative advantage in the production of all major crops, except wheat. On the incentive side, the existence of divergences in farm gate prices as compared with comparable border prices is leading to negative protection. This situation is not conducive to the sound development of the agriculture sector and could hinder investment decisions for further expansion of the sector. Efforts should be exerted to realign the farm gate prices with the comparable border prices for the sake of encouraging the efficient use of resources. Further expansion of the crops with solid comparative advantage should be encouraged and be supported by a

vigorous marketing strategy. Likewise, there is a need to carefully assess the impact of the current trade policy and that of the "Agricultural Calendar" on the efficiency and competitiveness of agriculture.

The profitability of farming in Lebanon is very sensitive to the stability of prices and yields and costs of production. Thus remunerative prices along with yield enhancing technologies shall guarantee the sustainability of high profits in farming, on the one hand, and reduce the costs of production on the other.

Despite implementing numerous development plans, the Ministry of Agriculture still lacks a long-term development strategy for the agricultural sector. In this context an early design and implementation of a long-term development strategy along with a prioritized investment program supported by coherent plans and well-coordinated policies shall put the agricultural sector on the path to sound and sustainable development in Lebanon.

ANNEXES

Table A1: Private Budgets Of Major Crops Grown In Lebanon
(in thousand Lebanese Pounds)

Items	CUCUMBER	TOMATO	EGGPLANT	CARROT	POTATO	SQUASH	SUGARBEET	MELON	TOBACCO	WHEAT
Tradable Outputs										
- Crop produce (output) (LBP)	10000.00	12880.00	1400.00	875.00	1020.00	1890.00	960.00	1200.00	1500.00	189.00
- By-product (if any) (LBP)										63.60
Tradable Inputs	2704.00	1723.50	635.00	161.50	441.64	286.00	280.50	423.80	164.99	78.00
- Seeds/Seedlings (LBP)	780.00	325.00	400.00	20.00	250.00	40.00	30.00	60.00	50.00	10.00
- Seed Transplanting (LBP)										
- Chemical Fertilizer										
- N.P.K.(LBP)										
- Nitrogen (LBP)	24.00		30.00	20.00	58.50		15.00	6.00	30.00	15.00
- Phosphorus (LBP)				7.50	25.00					
- Potash (LBP)				12.00						
- Soluble Fertilizer (LBP)	850.00	248.00				51.00	10.00	144.00		
- Foliar Fertilizer (LBP)		160.00	20.00		7.50		4.50	9.00		
- Plant Protection Chemicals (LBP)	465.00	940.50	120.00	40.00	35.50	165.00	49.00	85.00	60.00	22.00
- Mulch (LBP)								40.00		
- Machinery										
- Land Preparation (LBP)	135.00	50.00	15.00	22.00	21.39	30.00	52.00	64.80	24.99	10.00
- Sowing/Planting (LBP)					12.50		10.00	5.00		
- Husbandry (LBP)	450.00		50.00	40.00	16.25		20.00	10.00		6.00
- Harvesting					15.00		90.00			15.00
Non-Tradable Inputs	2780.00	2870.98	579.00	421.00	392.31	663.00	495.84	384.00	680.00	122.00
- Water Requirement (LBP)	50.00	49.98	250.00	100.00	89.60	45.00	240.00	150.00	50.00	
- Manure (LBP)		144.00	10.00	10.00		30.00		30.00		
- Manual Labor										
- Land Preparation (LBP)	60.00	14.00	20.00	20.00		15.00	9.96	6.00		
- Sowing/planting (LBP)	15.00	18.00	10.00	9.00	10.00	20.40	9.88	12.00		
- Husbandry (LBP)	500.00	1080.00	10.00	10.00	18.75	100.00	42.00	6.00	100.00	4.00
- Harvesting (LBP)	1000.00	480.00	100.00	100.00	54.00	100.10	48.00	54.00	132.00	8.00
- Pruning (LBP)									198.00	5.00
- Irrigation (LBP)			25.00	20.00	54.96	12.50	6.00	6.00		
- Capital Cost (LBP)	411.30	344.59	91.05	43.69	62.55	71.18	87.34	60.59	95.06	22.50
- Depreciation	1005.00	585.00	4.00	2.00	15.00	200.00	60.00	40.00	75.00	5.00
- Land Rent (LBP)	150.00	500.00	150.00	150.00	150.00	140.00	80.00	80.00	125.00	100.00

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Table A2: Social Budgets Of Major Crops Grown In Lebanon
(in thousand of Lebanese Pounds)

Items	CUCUMBER	TOMATO	EGGPLANT	CARROT	POTATO	SQUASH	SUGARBEET	MELON	TOBACCO	WHEAT
Tradable Outputs										
- Crop produce (output) (LBP)	16734.62	13442.69	4726.31	1714.90	1368.42	2674.20	790.60	3366.08	973.29	138.99
- By-product (if any) (LBP)										63.60
Tradable Inputs	2885.03	1764.64	651.79	177.80	460.68	296.82	320.72	451.13	169.52	85.90
- Seeds/Seedlings (LBP)	777.01	323.76	398.47	19.92	249.04	39.85	29.89	59.77	46.75	9.96
- Seed Transplanting (LBP)										
Chemical Fertilizer										
- N P K (LBP)	25.37						15.86			
- Nitrogen (LBP)			31.72	21.15	61.85			6.34	31.72	15.86
- Phosphorus (LBP)				7.93	26.43					
- Potash (LBP)				12.69						
- Soluble Fertilizer (LBP)	898.69	262.21				53.92	10.57	152.25		
- Foliar Fertilizer (LBP)		169.17	21.15		7.93		4.76	9.52		
- Plant Protection Chemicals (LBP)	468.90	948.39	121.01	40.34	35.80	166.39	49.41	85.71	60.50	22.18
- Mulch (LBP)								40.00		
Machinery										
- Land Preparation (LBP)	165.01	61.11	18.33	26.89	26.15	36.67	63.55	79.20	30.55	12.22
- Sowing/planting (LBP)					15.28		12.22	6.11		7.33
- Husbandry (LBP)	550.03		61.11	48.89	19.86		24.45	12.22		18.33
- Harvesting					18.33		110.01			122.00
Non-Tradable Inputs	2862.62	2960.25	411.89	354.15	395.54	717.46	388.46	432.92	636.63	
- Water Requirement (LBP)	132.62	139.25	82.89	33.15	92.83	99.46	132.62	198.92	6.63	
- Manure (LBP)		144.00	10.00	10.00		30.00		30.00		
Manual Labor										
- Land Preparation (LBP)	60.00	14.00	20.00	20.00	10.00	15.00	9.96	6.00	-	4.00
- Sowing/Planting (LBP)	15.00	18.00	10.00	9.00		20.40	9.88	12.00	100.00	8.00
- Husbandry (LBP)	500.00	1080.00	10.00	10.00	18.75	100.00	42.00	6.00	132.00	5.00
- Harvesting (LBP)	1000.00	480.00	100.00	100.00	54.00	100.10	48.00	54.00	198.00	
- Pruning (LBP)			25.00	20.00	54.96	12.50	6.00	6.00		
- Irrigation (LBP)				29.26	47.09	55.79	58.51	48.62	66.51	17.15
- Capital Cost (LBP)	316.12	259.87	58.50	2.00	15.00	200.00	60.00	40.00	75.00	5.00
- Depreciation	1005.00	585.00	4.00							
- Land Rent (LBP)	150.00	500.00	150.00	150.00	150.00	140.00	80.00	80.00	125.00	100.00

Table A3: Private Budgets Of Major Crops Grown In Lebanon
(in thousands Lebanese Pounds)

Items	APPLE	AVOCADO	BANANA	CITRUS	GRAPE	OLIVE	PEAR	STRAWBERRY	BANANA (Gh)	WATERMELON
Tradable Outputs										
- Crop produce (output) (LBP)	4000.00	2000.00	3700.00	2520.00	750.00	900.00	1140.00	22540.00	11760.00	1600.00
- By-product (if any) (LBP)										
Tradable Inputs	772.53	120.00	10.00	116.00	118.00	175.00	200.00	5137.41	2278.45	159.00
- Seeds/Seedlings (LBP)								2810.00	1260.00	45.00
- Seed Transplanting (LBP)										
Chemical Fertilizer										
- N-P-K (LBP)										
- Nitrogen (LBP)		30.00				18.00	12.00			2.00
- Phosphorus (LBP)		12.00				9.00	9.00			
- Potash (LBP)		40.00				18.00				
- Soluble Fertilizer (LBP)	99.90	30.00						795.71	859.95	
- Foliar Fertilizer (LBP)					3.00				45.00	
- Plant Protection Chemicals (LBP)	306.00	8.00	10.00	116.00	35.00	55.00	124.00	1451.70	101.00	30.00
- Mulch (LBP)										42.00
Machinery										
- Land Preparation (LBP)	99.99				20.00	50.00	25.00	80.00	12.50	40.00
- Sowing/Planting (LBP)										
- Husbandry (LBP)	266.64				60.00	25.00	30.00			
- Harvesting (LBP)										
Non-Tradable Inputs	1870.95	1438.80	829.90	1105.56	341.00	369.75	212.00	5754.30	4595.62	382.92
- Water Requirement (LBP)	117.00	188.00	55.00	10.50			50.00	49.30	1240.00	54.00
- Manure (LBP)	300.00	140.80	104.40	150.00	30.00	100.00	20.00	150.00	630.00	63.00
Manual Labor										
- Land Preparation (LBP)	49.95	37.50	62.50	60.00	18.00	15.00	15.00	56.00	19.98	12.00
- Sowing/planting (LBP)	199.80	22.50	5.00		3.00			104.00	15.00	12.00
- Husbandry (LBP)	200.00	220.00	87.50	57.50	75.00	141.75	10.00	1248.00	54.99	10.00
- Harvesting (LBP)	239.40	20.00	5.00	150.00	60.00	56.00	30.00	2640.00		6.00
- Pruning (LBP)	224.80	180.00	27.50	65.00	45.00		20.00		174.90	
- Irrigation (LBP)				162.56			10.00		123.00	25.92
- Capital Cost (LBP)	396.52	233.82	125.99	183.23	68.85	81.71	61.80	816.88	773.33	40.64
- Depreciation	40.00	30.00	83.00		30.00	7.00	7.00	1007.00	1887.75	50.00
- Land Rent (LBP)	500.00	600.00	400.00	450.00	80.00	50.00	50.00	500.00	450.00	150.00

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Table A4: Social Budgets Of Major Crops Grown In Lebanon
(in thousand Lebanese Pounds)

Items	APPLE	AVOCADO	BANANA	CITRUS	GRAPE	OLIVE	PEAR	STRAWBERRY	BANANA (Gh)	WATERMELON
Tradable Outputs										
- Crop produce (output) (LBP)	7419.56	3479.63	3936.57	4622.88	1674.65	901.20	1263.42	23826.62	8937.07	2816.79
- By-product (if any) (LBP)										
Tradable Inputs	862.32	126.48	10.08	116.97	136.25	194.71	214.47	5511.32	2467.70	194.18
- Seeds/Seedlings (LBP)										49.78
- Seed Transplanting (LBP)								3108.36	1393.78	
- Chemical Fertilizer										
- N.P.K.(LBP)										
- Nitrogen (LBP)		31.72				19.03	12.69			2.11
- Phosphorus (LBP)		12.69				9.52	9.52			
- Potash (LBP)		42.29				19.03				
- Soluble Fertilizer (LBP)	105.62	31.72						841.29	909.21	5.29
- Foliar Fertilizer (LBP)					3.17				47.58	15.86
- Plant Protection Chemicals (LBP)	308.57	8.07	10.08	116.97	35.29	55.46	125.04	1463.89	101.85	30.25
- Mulch (LBP)										42.00
- Machinery										
- Land Preparation (LBP)	122.22				24.45	61.11	30.56	97.78	15.28	48.89
- Sowing/planting (LBP)										
- Husbandry (LBP)	325.91				73.34	30.56	36.67			
- Harvesting										
Non-Tradable Inputs	1903.14	1516.03	1139.59	1164.68	341.00	369.75	175.26	6185.73	3355.95	627.31
- Water Requirement (LBP)	149.19	265.23	364.69	69.62			13.26	480.73	0.33	298.39
- Manure (LBP)	300.00	140.80	104.40	150.00	30.00	100.00	20.00	150.00	630.00	63.00
- Manual Labor										
- Land Preparation (LBP)	49.95	37.50	62.50	60.00	18.00		15.00	56.00	19.98	12.00
- Sowing/Planting (LBP)					3.00			104.00	15.00	12.00
- Husbandry (LBP)	199.80	22.50	5.00	57.50	75.00	15.00	10.00	1248.00	54.99	10.00
- Harvesting (LBP)	200.00	220.00	87.50	150.00	60.00	141.75	30.00	2640.00		6.00
- Pruning (LBP)	239.40	20.00	5.00	65.00	45.00	56.00	20.00		174.90	
- Irrigation (LBP)	224.80	180.00	27.50	162.56			10.00		123.00	
- Capital Cost (LBP)	304.20	180.68	126.46	140.98	52.50	62.09	42.87	643.34	480.45	25.92
- Depreciation	40.00	30.00	83.00		30.00	7.00	7.00	1007.00	1887.75	45.18
- Land Rent (LBP)	500.00	600.00	400.00	450.00	80.00	50.00	50.00	500.00	450.00	50.00 / 150.00

Table A5: Zone 1 (Jroud-Akkar, Dannieh, Ehden, Bcharre, Hasroun, T...noun..., Je..., K..., uan Ch...

(in Lebanese Pounds)

Items	Apple Kuruba	Apple Kfardebian	Apple Fama	Apple Akkar	Apple Ehden	Apple Fakra	Apple Hrajel	Apple Fraidek	Pears Akkar	Pears Fraidek	Pears Hasroun
PRIVATE PRICES											
Gross Output Price (LBP/kg)	500	500	475	300	300	665	400	300	500	600	500
Gross Output Units (kg)	1,250	5,000	2,000	2,800	2,500	1,500	3,000	2,900	1,800	1,900	1,800
Total Gross Output (LBP)	625,000	2,500,000	950,000	840,000	750,000	997,500	1,200,000	870,000	900,000	1,140,000	900,000
Seed (LBP)	0	0	0	0	0	0	0	0	0	0	0
Water Quantity (cm)	180	320	300	50	20	350	250	50	40	40	40
Water Value (LBP)	20,000	25,000	15,000	60,000	80,000	50,000	180,000	75,000	40,000	50,000	20,000
Fertilizers (LBP)	195,000	132,000	55,000	59,500	115,500	270,000	170,000	170,000	39,000	41,000	147,000
Manour	125,000	84,000	55,000	59,500	62,500	50,000	105,000	85,000	20,000	20,000	20,000
Nitrogen	0	0	0	0	0	270,000	0	50,000	12,000	12,000	12,000
Phosphate	0	0	0	22,000	22,000	200,000	0	20,000	9,000	9,000	6,000
Potash	0	0	0	7,500	7,500	0	0	20,000	18,000	9,000	9,000
Soluble	0	0	0	0	0	0	0	0	0	0	0
Chemicals (LBP)	70,000	48,000	55,000	30,000	53,000	70,000	75,000	15,000	127,000	124,000	114,700
Pesticides	166,000	269,000	136,000	126,000	129,500	208,000	190,000	100,000	127,000	100,000	102,700
Herbicides	120,000	195,000	118,000	90,000	99,000	160,000	140,000	75,000	94,000	100,000	102,700
Fungicides	24,000	24,000	13,000	12,000	10,500	12,000	20,000	25,000	20,000	14,000	12,000
Cost of Hired Machinery (LBP)	22,000	50,000	25,000	24,000	20,000	36,000	30,000	45,000	13,000	14,000	0
Land Preparation	80,000	205,000	188,000	38,000	30,000	300,900	130,000	45,000	40,300	55,000	45,000
Crop Husbandry	0	45,000	38,000	18,000	15,000	100,000	60,000	20,000	20,000	25,000	30,000
Total Labour (LBP)	165,000	510,000	302,000	117,500	75,000	342,000	425,000	102,000	105,000	85,000	90,000
Total Variable Cost	626,000	1,141,000	716,000	401,000	430,000	1,170,000	925,000	492,000	351,000	355,000	416,700
Gross Margin (LBP)	-1,000	1,359,000	234,000	439,000	320,000	-172,500	275,000	463,000	549,000	785,000	483,300
Depreciation	10,000	20,000	20,000	10,000	6,000	30,000	25,000	6,000	10,000	7,000	6,000
Interest on Capital	93,900	171,150	107,400	60,150	64,500	175,500	138,750	61,050	52,650	53,250	62,505
Land Rent	350,000	500,000	250,000	75,000	80,000	100,000	500,000	50,000	75,000	50,000	70,000
Total Fixed Cost (LBP)	453,900	691,150	377,400	145,150	150,500	305,500	663,750	117,050	137,650	110,250	138,585
SOCIAL PRICES											
Gross Output LBP per ton	927,445	927,445	927,445	927,445	927,445	927,445	927,445	927,445	664,960	664,960	664,960
Gross Output LBP per kg	927,445	927,445	927,445	927,445	927,445	927,445	927,445	927,445	664,960	664,960	664,960
Total Gross Output (LBP)	1,159,306	4,637,225	1,854,890	2,596,846	2,318,613	1,391,168	2,782,335	2,689,591	1,196,928	1,263,424	1,196,928
Seed											
Water Value (LBP)	59,677	106,093	99,462	16,577	6,631	116,039	82,885	16,577	13,262	13,262	13,262
Fertilizers (LBP)											
Manour	125,000	84,000	84,000	23,260	62,500	200,000	105,000	85,000	12,687	20,000	120,000
Nitrogen	0	0	0	0	0	0	0	0	9,516	12,687	12,687
Phosphate	0	0	0	7,930	0	0	0	52,864	19,031	9,516	6,344
Potash	0	0	0	0	0	0	0	21,146	0	0	9,516
Soluble											
Chemicals (LBP)	74,010	50,750	58,151	31,719	56,036	74,010	79,296	15,859	128,066	125,041	115,663
Pesticides	167,393	271,238	157,309	127,058	130,587	209,746	191,595	100,839	94,789	100,839	103,562
Herbicides	121,007	196,637	118,991	90,755	99,831	161,343	141,175	75,630	94,789	100,839	103,562
Fungicides	24,201	24,201	13,109	12,101	10,588	12,101	20,168	0	20,168	10,084	12,101
Cost of Hired Machinery (LBP)	22,185	50,420	25,210	24,201	20,168	36,302	30,252	25,210	13,109	14,118	12,101
Land Preparation	97,784	250,571	229,792	46,447	36,669	366,689	158,898	55,003	48,892	67,226	55,003
Crop Husbandry											
Total Labour (LBP)	165,000	510,000									
Total Variable Cost (LBP)	688,864	1,272,671	846,714	370,490	367,423	1,308,484	1,042,675	449,289	336,454	332,732	422,474
Gross Margin (LBP)	-1,000	1,359,000	234,000	439,000	367,423	-172,500	275,000	463,000	549,000	785,000	422,474
Depreciation (LBP)	10,000	20,000	20,000	10,000	6,000	30,000	25,000	6,000	10,000	7,000	6,000
Interest on Capital (LBP)	68,860	125,510	78,760	44,110	47,300	128,700	101,750	44,770	38,610	39,050	45,837
Land Rent (LBP)	350,000	500,000	250,000	75,000	80,000	100,000	500,000	50,000	75,000	50,000	70,000
Total Fixed Cost (LBP)	428,860	645,510	348,760	129,110	133,300	258,700	626,750	100,770	123,610	96,050	121,837

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Table A6: Zone 2 (Akkar and Minieh Coast)
(in Lebanese Pounds)

Items	Carrots Akkar Plain	Orange Minieh	Orange Coastal Akkar	Valencia Coastal Akkar	Cucumber Minieh	Eggplant Akkar Plain	Grapes Akkar Plain	Potato Coastal Akkar	Squash Minieh	Tobacco Coastal Akkar	Tomato Minieh GH	Wheat Akkar Plain
PRIVATE PRICES												
Gross Output Price (LBP/kg)	250	400	300	550	500	200	2,730	350	700	7,500	500	450
Gross Output Units (kg)	3,500	3,700	3,800	4,500	20,000	7,000	2,200	2,400	2,100	140	17,500	900
Total Gross Output (LBP)	875,000	1,480,000	1,140,000	2,475,000	10,000,000	1,400,000	6,006,000	840,000	1,470,000	1,050,000	8,750,000	405,000
Seed (LBP)	20,000	0	0	0	802,500	400,000	0	225,000	50,000	90,000	590,000	7,500
Water Quantity (cm)	100	500	1,200	800	500	250	0	340	50	250	360	0
Water Value (LBP)	100,000	10,000	36,000	24,000	12,500	250,000	0	90,000	50,000	25,000	7,200	0
Fertilizers (LBP)	54,500	168,600	188,400	219,500	525,600	120,000	37,000	86,150	180,000	45,000	776,500	15,000
Manour	10,000	120,000	135,000	90,000	161,000	10,000	0	0	70,000	0	178,500	0
Nitrogen	20,000	21,600	21,600	82,000	19,600	90,000	15,000	48,750	0	37,500	226,000	15,000
Phosphate	7,500	9,000	10,800	26,500	0	0	9,000	28,400	0	0	0	0
Potash	12,000	18,000	21,000	21,000	0	0	13,000	0	10,000	0	0	0
Soluble	5,000	0	0	0	345,000	20,000	0	9,000	100,000	7,500	372,000	0
Chemicals (LBP)	40,000	108,500	172,500	227,000	450,000	120,000	42,000	33,800	170,000	46,500	450,000	20,000
Pesticides	5,000	90,000	150,000	148,000	200,000	95,000	20,000	4,800	70,000	30,000	200,000	0
Herbicides	25,000	18,500	22,500	21,000	0	10,000	7,000	2,500	0	1,500	0	20,000
Fungicides	10,000	0	0	58,000	250,000	15,000	15,000	26,500	100,000	15,000	250,000	0
Cost of Hired Machinery (LBP)	62,000	41,750	57,600	52,440	233,000	65,000	40,000	55,620	95,000	40,000	115,000	36,000
Land Preparation	22,000	15,750	0	3,570	125,000	15,000	20,000	22,620	20,000	25,000	45,000	10,000
Crop Husbandry	40,000	26,000	57,600	48,870	108,000	50,000	20,000	33,000	75,000	15,000	70,000	26,000
Total Labour (LBP)	159,000	353,000	290,600	423,320	937,000	165,000	165,000	122,100	245,000	351,000	1,044,000	17,000
Total Variable Cost	435,500	681,850	745,100	946,260	2,960,600	1,120,000	284,000	612,670	790,000	597,500	2,982,700	95,500
Gross Margin (LBP)	439,500	798,150	394,900	1,528,740	7,039,400	280,000	5,722,000	227,330	680,000	452,500	5,767,300	167,000
Depreciation	2,000	10,000	10,000	6,000	500,000	4,000	5,000	20,000	200,000	45,000	500,000	3,000
Interest on Capital	32,660	102,280	111,765	141,939	222,045	84,000	42,600	45,950	59,250	67,220	223,700	10,740
Land Rent	150,000	200,000	180,000	250,000	150,000	150,000	150,000	100,000	150,000	100,000	150,000	100,000
Total Fixed Cost (LBP)	184,660	312,280	301,765	397,939	872,045	238,000	197,600	165,950	409,250	212,220	873,700	113,740
SOCIAL PRICES												
Gross Output LBP per ton	489,970	1,100,685	1,100,685	1,100,685	669,385	675,187	1,116,434	402,475	990,445	2,729,842	584,465	330,917
Gross Output LBP per kg	489.970	1100.685	1100.685	1100.685	669.385	675.187	1116.434	402.475	990.445	2729.842	584.465	330.917
Total Gross Output (LBP)	1,714,895	4,072,535	4,182,603	4,953,083	13,387,696	4,726,310	2,456,155	965,940	2,079,935	382,178	10,228,131	297,826
Seed	19,923	0	0	0	799,427	398,468	0	224,139	49,809	84,155	587,741	9,167
Water Value (LBP)	33,154	165,770	397,848	265,232	165,770	82,885	0	112,724	16,577	82,885	119,354	0
Fertilizers (LBP)												
Manour	10,000	120,000	135,000	90,000	161,000	10,000	0	0	70,000	0	178,500	0
Nitrogen	21,146	22,837	22,837	86,697	20,723	95,156	15,859	51,543	0	39,648	238,947	15,859
Phosphate	7,930	9,516	11,419	28,018	0	0	9,516	30,027	0	0	0	0
Potash	12,687	19,031	22,203	22,203	0	0	13,745	0	10,573	0	0	0
Soluble	5,286	0	0	0	364,764	21,146	0	9,516	105,729	7,930	393,310	0
Chemicals (LBP)	40,336	109,411	173,948	228,905	453,777	121,007	42,353	34,084	171,427	46,890	453,777	20,168
Pesticides	5,042	90,755	151,259	149,242	201,679	95,797	20,168	4,840	70,588	30,252	201,679	0
Herbicides	25,210	18,655	22,689	21,176	0	10,084	7,059	2,521	0	1,513	0	20,168
Fungicides	10,084	0	0	58,487	252,099	15,126	15,126	26,722	100,839	15,126	252,099	0
Cost of Hired Machinery (LBP)	75,782	51,031	70,404	64,097	284,795	79,449	48,892	67,984	116,118	48,892	140,564	44,003
Land Preparation												
Crop Husbandry												
Total Labour (LBP)	159,000	353,000	290,600	423,320	937,000	165,000	165,000	122,100	245,000	351,000	1,044,000	17,000
Total Variable Cost (LBP)	385,245	850,596	1,124,259	1,208,473	3,187,256	973,111	295,364	652,115	785,232	661,400	3,156,194	106,197
Gross Margin (LBP)	439,500	798,150	394,900	1,528,740	7,039,400	280,000	5,722,000	227,330	680,000	452,500	5,767,300	167,000
Depreciation (LBP)	2,000	10,000	10,000	6,000	500,000	4,000	5,000	20,000	200,000	45,000	500,000	3,000
Interest on Capital (LBP)	23,951	75,005	81,961	104,089	162,833	61,600	31,240	33,697	43,450	49,295	164,047	7,876
Land Rent (LBP)	150,000	200,000	180,000	250,000	150,000	150,000	150,000	100,000	150,000	100,000	150,000	100,000
Total Fixed Cost (LBP)	175,951	285,005	271,961	360,089	812,833	215,600	186,240	153,697	393,450	194,295	814,047	110,876

(In Lebanese Pounds)

Items	Cucumber Sebael GH	Cucumber Anfeh GH	Cucumber Zghorta GH	Olives Koura	Tomato Anfeh GH	Tomato Zghorta GH	Tomato Sebael GH
PRIVATE PRICES							
Gross Output Price (LBP/kg)	400	400	500	1,500	500	500	700
Gross Output Units (kg)	10,000	10,000	12,000	350	20,000	18,000	10,000
Total Gross Output (LBP)	4,000,000	4,000,000	6,000,000	525,000	10,000,000	9,000,000	7,000,000
Seed (LBP)	825,000	800,000	802,500	0	390,000	378,000	425,000
Water Quantity (cm)	525	150	500	0	300	500	200
Water Value (LBP)	450,000	750,000	1,000,000	0	45,000	1,000,000	1,000,000
Fertilizers (LBP)	619,500	384,000	706,900	34,300	566,000	654,000	514,000
Manour	144,500	136,000	159,000	0	40,000	159,000	159,000
Nitrogen	0	0	67,900	11,200	0	0	0
Phosphate	0	0	0	8,400	0	0	0
Potash	0	0	0	14,700	0	0	0
Soluble	475,000	248,000	480,000	0	526,000	495,000	355,000
Chemicals (LBP)	999,500	979,500	979,500	24,000	940,500	757,000	1,131,500
Pesticides	200,000	250,000	300,000	24,000	480,000	226,500	600,000
Herbicides	0	0	0	0	0	0	0
Fungicides	799,500	729,500	679,500	0	460,500	530,500	531,500
Cost of Hired Machinery (LBP)	75,000	37,500	25,000	50,000	37,500	25,000	75,000
Land Preparation	75,000	37,500	25,000	30,000	37,500	25,000	75,000
Crop Husbandry	0	0	0	20,000	0	0	0
Total Labour (LBP)	2,118,000	1,460,000	2,045,000	172,200	1,980,000	1,770,000	1,580,000
Total Variable Cost	5,087,000	4,411,000	5,558,900	280,500	3,959,000	4,584,000	4,725,500
Gross Margin (LBP)	-1,087,000	-411,000	441,100	244,500	5,842,000	4,416,000	2,275,500
Depreciation	970,000	960,000	965,000	10,000	950,000	950,000	945,000
Interest on Capital	381,525	330,825	416,920	42,075	311,850	343,800	354,340
Land Rent	750,000	300,000	600,000	53,000	600,000	300,000	200,000
Total Fixed Cost (LBP)	2,101,525	1,590,825	1,981,920	105,075	1,861,850	1,593,800	1,499,340
SOCIAL PRICES							
Gross Output LBP per ton	669,385	669,385	669,385	1,802,395	584,465	584,465	584,465
Gross Output LBP per kg	669.385	669.385	669.385	1802.395	584.465	584.465	584.465
Total Gross Output (LBP)	6,693,848	6,693,848	8,032,618	630,838	11,689,292	10,520,363	5,844,646
Seed	821,841	796,937	799,427	0	388,507	376,553	423,373
Water Value (LBP)	174,059	49,731	165,770	0	99,462	165,770	66,308
Fertilizers (LBP)							
Manour	144,500	136,000	159,000	0	40,000	159,000	159,000
Nitrogen	0	0	71,790	11,842	0	0	0
Phosphate	0	0	0	8,881	0	0	0
Potash	0	0	0	15,542	0	0	0
Soluble	502,211	262,207	507,497	0	556,132	523,357	375,337
Chemicals (LBP)	1,007,890	987,722	987,722	24,201	948,395	763,354	1,140,998
Pesticides	201,679	252,099	302,518	24,201	484,029	228,401	605,036
Herbicides	0	0	0	0	0	0	0
Fungicides	806,211	735,624	685,204	0	464,366	534,953	535,961
Cost of Hired Machinery (LBP)	91,672	45,836	30,557	61,115	45,836	30,557	91,672
Land Preparation							
Crop Husbandry							
Total Labour (LBP)	2,118,000	1,460,000	2,045,000	172,200	1,980,000	1,770,000	1,580,000
Total Variable Cost (LBP)	4,860,173	3,738,433	4,766,764	293,781	4,058,332	3,788,591	3,836,687
Gross Margin (LBP)	-1,087,000	-411,000	441,100	244,500	5,842,000	4,416,000	2,275,500
Depreciation (LBP)	970,000	960,000	965,000	10,000	950,000	950,000	945,000
Interest on Capital (LBP)	279,785	242,605	305,741	30,855	228,690	252,120	259,849
Land Rent (LBP)	750,000	300,000	600,000	53,000	600,000	300,000	200,000
Total Fixed Cost (LBP)	1,999,785	1,502,605	1,870,741	93,855	1,778,690	1,502,120	1,404,849

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Table A8: Zone 4 (Kesrouan, Metn, Baabda, Aley, Coastal Plain of Chouf, Batroun and Jbeil) (in Lebanese Pounds)

Items	Cucumber Amchit GH	Cucumber Jbeil GH	Cucumber Jieh GH	Oliver Chouf	Strawberry Chewefat GH	Strawberry Batroun GH	Tomato Jbeil GH	Tomato Amchit GH	Tomato Halat GH	Tomato Saideyat GH	Tomato Chewefat GH	Tomato Jadra GH	Tomato Naameh GH
PRIVATE PRICES													
Gross Output Price (LBP/kg)	400	460	675	2,750	3,000	2,450	425	400	500	900	600	500	600
Gross Output Units (kg)	9,200	13,000	11,770	600	7,000	9,200	14,000	8,000	17,550	14,000	15,000	15,000	12,500
Total Gross Output (LBP)	3,680,000	5,980,000	7,944,750	1,650,000	21,000,000	22,540,000	5,950,000	3,200,000	8,775,000	12,600,000	9,000,000	7,500,000	7,500,000
Seed (LBP)	772,500	922,500	1,000,000		3,650,000	2,810,000	240,000	500,000	245,000	245,000	421,000	387,000	421,000
Water Quantity (cm)	380	400	330		600	1,450	825	440	1,420	425	450	500	550
Water Value (LBP)	115,000	40,000	525,000	110,000	180,000	50,000	1,091,250	145,000	145,000	110,000	238,000	350,000	350,000
Fertilizers (LBP)	275,500	281,200	776,000		1,327,750	1,159,700	597,300	455,650	365,000	974,000	787,000	740,000	930,000
Manour	0	0	270,000	60,000	703,750	364,000	135,000	144,000	80,000	268,000	245,000	200,000	450,000
Nitrogen	0	0	30,000	50,000	0	0	25,500	41,250	57,000	24,000	30,000	25,000	25,000
Phosphate	0	0	30,000	0	0	0	0	0	0	24,000	30,000	25,000	25,000
Potash	0	0	30,000	0	0	0	0	0	0	24,000	30,000	25,000	25,000
Soluble	275,500	281,200	416,000	0	624,000	795,700	436,800	270,400	228,000	634,000	452,000	465,000	405,000
Chemicals (LBP)	713,500	875,990	1,073,000	40,000	2,307,000	396,700	261,250	777,300	189,300	1,069,000	1,456,000	319,000	1,151,090
Pesticides	265,000	378,750	225,000	30,000	900,000	290,000	185,750	457,800	81,800	299,000	756,000	144,000	412,000
Herbicides	0	0	0	10,000	0	0	0	0	0	0	0	0	0
Fungicides	448,500	497,240	848,000	0	1,407,000	106,700	75,500	319,500	107,500	770,000	790,000	175,000	739,000
Cost of Hired Machinery (LBP)	60,000	50,000	0	100,000	75,000	80,000	60,000	50,000	50,000	100,000	70,000	90,000	75,000
Land Preparation	60,000	50,000	0	65,000	0	0	60,000	50,000	50,000	100,000	70,000	90,000	75,000
Crop Husbandry	0	0	0	35,000	75,000	80,000	0	0	0	0	0	0	0
Total Labour (LBP)	1,210,000	1,207,500	1,230,000	170,000	4,116,000	4,048,000	1,066,000	1,292,000	1,580,000	2,332,000	2,376,000	2,237,000	1,605,000
Total Variable Cost	3,146,500	3,377,190	4,604,000	420,000	11,655,750	8,544,400	3,315,800	3,219,950	2,574,300	5,006,000	5,348,000	4,123,000	4,532,000
Gross Margin (LBP)	533,500	2,602,810	3,340,000	1,230,000	9,344,250	12,940,600	2,634,200	-19,950	6,200,700	7,594,000	3,662,000	3,377,000	2,968,000
Depreciation	540,000	580,000	516,000	50,000	1,130,000	1,007,000	545,000	485,000	570,300	1,032,000	517,000	516,000	987,000
Interest on Capital	235,987	253,290	345,300	63,000	874,180	719,955	248,685	241,500	193,070	375,450	400,350	309,225	339,900
Land Rent	400,000	300,000	335,000	175,000	1,050,000	500,000	150,000	300,000	650,000	225,000	525,000	150,000	300,000
Total Fixed Cost (LBP)	1,175,987	1,133,290	1,196,300	288,000	3,054,180	2,226,955	943,685	1,026,500	1,413,370	1,632,450	1,442,350	975,225	1,626,900
SOCIAL PRICES													
Gross Output LBP per tons	669,385	669,385	669,385	1,802,395	2,589,850	2,589,850	584,465	584,465	584,465	584,465	584,465	584,465	584,465
Gross Output LBP per kg	669,385	669,385	669,385	1802.395	2589.850	2589.850	584,465	584,465	584,465	584,465	584,465	584,465	584,465
Total Gross Output (LBP)	6,158,340	8,702,002	7,878,659	1,081,437	18,128,950	23,826,620	8,182,504	4,675,717	10,257,354	8,182,504	8,766,969	8,766,969	7,305,808
Seed	769,542	918,968	996,171	0	4,037,549	3,108,360	239,081	498,086	244,062	419,388	419,388	385,518	419,388
Water Value (LBP)	125,985	132,616	116,039	52,864	198,924	480,733	273,521	145,878	470,787	140,905	149,193	165,770	182,347
Fertilizers (LBP)													
Manour													
Nitrogen	0	0	31,719		0	0	26,961	43,613	60,265	25,375	31,719	26,432	26,432
Phosphate	0	0	31,719		0	0				25,375	31,719	26,432	26,432
Potash			31,719							25,375	31,719	26,432	26,432
Soluble	291,282	297,309	439,831		659,746	841,282	461,823	285,890	241,061	670,519	477,893	491,638	428,201
Chemicals (LBP)	719,489	883,343	1,082,007	40,336	2,326,365	400,030	263,443	783,825	190,889	1,077,973	1,468,222	321,678	1,160,662
Pesticides	267,224	381,929	226,889	30,252	907,555	292,434	187,309	461,643	82,487	301,510	762,346	145,209	415,458
Herbicides	0	0	0	10,084	0	0	0	0	0	0	0	0	0
Fungicides	452,265	501,414	855,118	0	1,418,811	107,596	76,134	322,182	108,402	776,464	705,876	176,469	745,203
Cost of Hired Machinery (LBP)	73,338	61,115	0	122,230	91,672	97,784	73,338	61,115	61,115	122,230	85,561	110,007	91,672
Land Preparation													
Crop Husbandry													
Total Labour (LBP)	1,210,000	1,207,500	1,230,000	170,000	4,116,000	4,048,000	1,066,000	1,292,000	1,580,000	2,332,000	2,376,000	2,237,000	1,605,000
Total Variable Cost (LBP)	3,189,637	3,500,851	4,229,204	445,430	12,134,007	9,340,189	2,539,166	3,254,406	2,928,179	5,106,939	5,316,413	3,990,907	4,416,566
Gross Margin (LBP)	2,968,703	5,201,151	3,649,455	636,007	5,994,943	14,486,431	5,643,338	1,421,311	7,329,175	3,075,565	3,450,556	4,776,062	2,889,242
Depreciation (LBP)	540,000	580,000	516,000	50,000	1,130,000	1,007,000	545,000	485,000	570,300	1,032,000	517,000	516,000	987,000
Interest on Capital (LBP)	173,057	185,746	253,220	46,200	641,065	527,967	182,369	177,100	141,585	275,330	293,590	226,765	249,260
Land Rent (LBP)	400,000	300,000	335,000	175,000	1,050,000	500,000	150,000	300,000	650,000	225,000	525,000	150,000	300,000
Total Fixed Cost (LBP)	1,113,057	1,065,746	1,104,220	271,200	2,821,065	2,034,967	877,369	962,100	1,361,885	1,532,330	1,335,590	892,765	1,536,260

Table A5. Zone 5 (Coastal Saida and Sour)
(In Lebanese Pounds)

Items	Avocado Ghazieh	Banana Aboussoud	Banana Akabieh	Banana Zahrani	Banana Sour	Valencia Aboussoud	Valencia Brak	Valencia Ansariyeh	Valencia Sour	Lemon Ghazieh	Orange Brak	Orange Sour	Cucumber Zahrani GH	Tomato Zahrani GH
PRIVATE PRICES														
Gross Output Price (LBP/kg)	2,000	1,000	1,000	800	800	600	500	444	454	500	600	400	375	400
Gross Output Units (kg)	1,000	4,000	3,500	3,000	1,300	4,200	4,000	5,060	2,538	3,000	3,000	3,000	13,000	12,000
Total Gross Output (LBP)	2,000,000	4,000,000	3,500,000	2,400,000	1,040,000	2,520,000	2,000,000	2,246,640	1,152,252	1,500,000	1,800,000	1,200,000	4,875,000	4,800,000
Seed (LBP)	0	80,000	102,000	30,000	207,400	0	0	0	2,000	0	0	65,000	750,000	212,500
Water Quantity (cm)	800	1,100	1,000	1,000	800	210	800	560	500	700	800	750	400	425
Water Value (LBP)	188,000	49,500	75,000	86,000	210,000	50,000	80,000	48,000	37,500	91,000	72,000	73,500	60,000	63,750
Fertilizers (LBP)	209,500	1,232,500	630,250	530,500	319,000	192,000	233,250	227,500	198,800	135,000	188,000	212,900	380,000	252,000
Manure	141,000	800,000	400,000	262,500	220,000	150,000	120,000	180,000	81,000	75,000	120,000	78,000	0	54,000
Nitrogen	30,000	82,500	90,000	120,000	20,000	0	50,000	14,000	0	24,000	21,000	62,500	40,000	54,000
Phosphate	12,000	0	0	28,000	0	0	0	7,500	0	0	10,500	45,400	0	27,000
Potash	0	0	0	120,000	0	0	0	26,000	0	0	0	0	0	0
Soluble	46,500	350,000	82,500	0	35,000	42,000	30,250	37,000	117,800	36,000	36,500	27,000	340,000	117,000
Chemicals (LBP)	8,000	10,000	63,750	30,000	35,000	116,000	33,000	27,000	30,000	115,000	109,000	201,500	775,000	300,000
Pesticides	8,000	0	22,500	0	21,000	106,000	130,000	10,000	24,000	85,000	85,000	90,000	175,000	150,000
Herbicides	0	10,000	22,500	30,000	0	10,000	100,000	0	6,000	30,000	24,000	27,500	600,000	150,000
Fungicides	0	0	0	0	21,000	0	30,000	12,000	0	0	0	84,000	90,000	0
Cost of Hired Machinery (LBP)	37,500	65,000	30,000	30,000	130,000	0	0	12,000	10,000	30,000	36,000	24,000	60,000	60,000
Land Preparation	37,500	45,000	30,000	30,000	20,000	0	0	12,000	10,000	30,000	36,000	24,000	60,000	60,000
Crop Husbandry	0	20,000	0	0	110,000	0	0	0	0	30,000	36,000	24,000	30,000	60,000
Total Labour (LBP)	330,000	345,000	272,000	228,500	423,000	370,500	393,000	300,000	282,300	324,000	520,000	435,000	1,136,000	1,430,000
Total Variable Cost	833,000	1,782,000	1,137,750	935,000	1,301,400	728,500	866,250	624,500	560,600	695,000	925,050	1,011,900	3,201,000	2,318,250
Gross Margin (LBP)	1,167,000	2,218,000	2,361,750	1,459,000	-261,400	1,791,500	1,133,750	1,621,500	591,400	805,000	876,000	188,100	1,674,000	2,421,750
Depreciation	30,000	40,000	25,000	30,000	30,000	0	25,000	35,000	30,000	30,000	30,000	30,000	300,000	450,000
Interest on Capital	124,950	267,300	170,740	141,150	195,210	109,275	129,940	93,675	84,090	104,250	138,600	151,785	240,075	173,870
Land Rent	600,000	600,000	700,000	650,000	455,000	450,000	600,000	450,000	450,000	600,000	700,000	500,000	300,000	350,000
Total Fixed Cost (LBP)	754,950	907,300	895,740	821,150	708,210	559,275	754,940	578,675	564,090	734,250	868,600	681,785	840,075	973,870
SOCIAL PRICES														
Gross Output LBP per ton	3,479,632	1,063,937	1,063,937	1,063,937	1,063,937	1,100,685	1,100,685	1,100,685	1,100,685	1,100,685	1,100,685	1,100,685	669,385	584,465
Gross Output LBP per kg	3,479,632	1063.937	1063.937	1063.937	1063.937	1100.685	1100.685	1100.685	1100.685	1100.685	1100.685	1100.685	669.385	584.465
Total Gross Output (LBP)	3,479,632	4,255,749	3,723,780	3,191,812	1,383,118	4,622,877	4,402,740	5,569,467	2,793,539	3,302,055	3,302,055	3,302,055	8,702,002	7,013,575
Seed	0	88,494	112,830	33,185	229,421	0	0	0	2,212	0	0	71,902	757,090	211,686
Water Value (LBP)	265,232	364,694	331,540	331,540	265,232	69,623	265,232	185,662	165,770	232,078	265,232	248,655	132,616	140,905
Manure	141,000	800,000	400,000	262,500	220,000	150,000	120,000	180,000	81,000	75,000	120,000	78,000	0	54,000
Nitrogen	31,719	87,226	95,156	126,874	21,146	0	52,864	14,802	0	25,375	22,203	66,080	40,000	57,093
Phosphate	12,687	0	0	29,604	0	0	0	7,930	0	0	11,102	48,001	0	28,547
Potash	42,291	370,050	87,226	126,874	37,005	44,406	31,983	27,489	124,548	0	0	0	0	0
Soluble	49,164	10,084	67,402	0	37,005	116,974	34,890	37,311	30,252	38,062	38,591	28,547	359,477	123,702
Chemicals (LBP)	0	0	22,689	30,252	21,176	106,890	131,091	27,227	24,201	115,965	109,915	203,191	781,505	302,518
Pesticides	8,067	10,084	22,689	30,252	21,176	10,084	100,839	10,084	6,050	85,714	85,714	90,755	176,469	151,259
Herbicides	0	0	0	0	0	0	30,252	0	0	30,252	24,201	27,731	605,036	151,259
Fungicides	0	0	0	0	0	0	0	0	0	0	0	84,705	110,007	73,338
Cost of Hired Machinery (LBP)	45,836	79,449	36,669	30,252	21,176	10,084	36,669	14,668	12,223	36,669	44,003	29,335		
Land Preparation														
Crop Husbandry	79,449	36,669	36,669	36,669	158,898		36,669	14,668	12,223	36,669	44,003	29,335		
Total Labour (LBP)	330,000	345,000	272,000	228,500	423,000	370,500	393,000	300,000	282,300	324,000	520,000	435,000	1,136,000	1,430,000
Total Variable Cost (LBP)	925,997	2,144,998	1,425,512	1,205,999	1,412,884	751,503	1,065,730	767,862	698,305	847,149	1,131,045	1,208,711	3,316,695	2,421,790
Gross Margin (LBP)	1,167,000	2,218,000	2,361,750	1,459,000	-261,400	1,791,500	1,133,750	1,621,500	591,400	805,000	876,000	188,100	1,674,000	2,421,750
Depreciation (LBP)	30,000	40,000	25,000	30,000	58,000	80,135	25,000	35,000	30,000	30,000	30,000	30,000	300,000	450,000
Interest on Capital (LBP)	91,630	196,020	123,209	103,510	143,154		95,289	68,695	61,666	76,450	101,640	111,309	176,055	127,505
Land Rent (LBP)	600,000	600,000	700,000	650,000	455,000	450,000	600,000	450,000	450,000	600,000	700,000	500,000	300,000	350,000
Total Fixed Cost (LBP)	721,630	836,020	850,209	783,510	656,154	530,135	720,289	553,695	541,666	706,450	831,640	641,309	776,055	927,505

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Table A10: Zone-6 (Zahle and West Bekaa)
(In Lebanese Pounds)

Items	Apple Bekaa	Cucumber Bekaa GH	Grapes Bekaa Processing	Grapes Bekaa Table	Melon Bekaa Irrigated	Potato Bekaa Irrigated	Sugarbeet Bekaa Irrigated	Tomato Bekaa Irrigated	Watermelon Bekaa Irrigated	Wheat Bekaa Rainfed
PRIVATE PRICES										
Gross Output Price (LBP/kg)	400	325	500	500	300	300	120	300	200	450
Gross Output Units (kg)	5,000	25,000	1,500	1,500	4,000	3,000	8,000	8,000	4,000	400
Total Gross Output (LBP)	2,000,000	8,125,000	750,000	750,000	1,200,000	900,000	960,000	2,400,000	800,000	180,000
Seed (LBP)	22,000	500,000	0	4,500	60,000	250,000	30,000	160,000	15,000	10,000
Water Quantity (cm)	250	800	0	60	600	600	400	1,000	400	40
Water Value (LBP)	250,000	200,000	0	60,000	150,000	150,000	240,000	250,000	100,000	10,000
Fertilizers (LBP)	370,000	592,500	58,000	168,000	478,000	144,000	95,500	488,500	250,000	17,250
Manour	100,000	100,000	30,000	100,000	274,000	0	0	70,000	70,000	0
Nitrogen	60,000	110,000	0	15,000	51,000	115,000	81,000	45,000	51,000	17,250
Phosphate	0	0	0	0	0	0	0	0	0	0
Potash	0	0	0	0	0	0	0	0	0	0
Soluble	210,000	382,500	28,000	53,000	153,000	29,000	14,500	373,500	129,000	0
Chemicals (LBP)	75,000	310,000	35,000	36,000	85,000	39,000	49,000	127,500	85,000	1,500
Pesticides	45,000	60,000	15,000	18,000	35,000	20,000	25,000	52,500	35,000	0
Herbicides	3,000	0	5,000	3,000	0	1,000	9,000	0	0	1,500
Fungicides	27,000	250,000	15,000	15,000	50,000	18,000	15,000	75,000	50,000	0
Cost of Hired Machinery (LBP)	75,000	90,000	80,000	125,000	80,000	69,300	172,000	325,000	75,000	41,250
Land Preparation	75,000	90,000	20,000	25,000	50,000	36,000	50,000	50,000	50,000	15,000
Crop Husbandry	0	0	60,000	100,000	30,000	33,300	122,000	275,000	25,000	26,250
Total Labour (LBP)	433,000	658,500	201,000	142,000	84,000	85,800	116,000	183,000	57,000	11,250
Total Variable Cost	1,225,000	2,351,000	374,000	535,500	937,000	738,100	702,500	1,534,000	582,000	91,250
Gross Margin (LBP)	775,000	5,774,000	376,000	-1,285,500	467,000	161,900	257,500	866,000	218,000	68,750
Depreciation	0	960,000	30,000	80,000	40,000	60,000	60,000	40,000	40,000	6,000
Interest on Capital	183,750	0	56,100	80,325	54,975	55,360	79,030	115,050	43,650	10,270
Land Rent	200,000	100,000	80,000	200,000	80,000	115,360	80,000	80,000	80,000	16,270
Total Fixed Cost (LBP)	383,750	1,060,000	166,100	360,325	174,975	230,720	219,030	235,050	163,650	32,540
SOCIAL PRICES										
Gross Output LBP per ton	927,445	669,385	1,116,434	1,116,434	841,520	402,475	98,825	584,465	704,199	330,917
Gross Output LBP per kg	927.445	669.385	1116.434	1116.434	841.520	402.475	98.825	584.465	704.199	330.917
Total Gross Output (LBP)	4,637,225	16,734,620	1,674,651	1,674,651	3,366,079	1,207,425	790,602	4,675,717	2,816,794	132,367
Seed	24,336	498,086	0	4,978	66,371	249,043	29,885	159,387	16,593	12,223
Water Value (LBP)	82,885	265,232	0	19,892	198,924	198,924	132,616	331,540	132,616	13,262
Fertilizers (LBP)										
Manour	100,000	100,000	30,000	100,000	274,000	0	0	70,000	70,000	0
Nitrogen	63,437	116,301	0	15,859	53,922	121,588	85,640	47,578	53,922	18,238
Phosphate	0	0	0	0	0	0	0	0	0	0
Potash	0	0	0	0	0	0	0	0	0	0
Soluble	222,030	404,412	29,604	56,036	161,765	30,661	15,331	394,896	136,390	0
Chemicals (LBP)	75,630	312,602	35,294	36,302	85,714	39,327	49,411	128,570	85,714	1,513
Pesticides	45,378	60,504	15,126	18,151	35,294	20,168	25,210	52,941	35,294	0
Herbicides	3,025	0	5,042	3,025	0	1,008	9,076	0	0	1,513
Fungicides	27,227	252,099	15,126	15,126	50,420	18,151	15,126	75,630	50,420	0
Cost of Hired Machinery (LBP)	91,672	110,007	97,784	152,787	97,784	84,705	210,235	397,246	91,672	50,420
Land Preparation										
Crop Husbandry										
Total Labour (LBP)	433,000	658,500	201,000	142,000	84,000	85,800	116,000	183,000	57,000	11,250
Total Variable Cost (LBP)	1,092,990	2,465,140	393,681	527,855	1,022,478	810,048	639,118	1,712,218	643,906	106,905
Gross Margin (LBP)	775,000	5,774,000	376,000	-1,285,500	467,000	161,900	257,500	866,000	218,000	68,750
Depreciation (LBP)	0	960,000	30,000	80,000	40,000	60,000	60,000	40,000	40,000	6,000
Interest on Capital (LBP)	134,750	0	41,140	58,905	40,315	40,597	57,955	84,370	32,010	7,531
Land Rent (LBP)	200,000	100,000	80,000	200,000	80,000	115,360	80,000	80,000	80,000	16,270
Total Fixed Cost (LBP)	334,750	1,060,000	151,140	338,905	160,315	215,957	197,955	204,370	152,010	29,801

Table 11: Zone 7 (Baalbeck)
(in Lebanese Pounds)

Items	Apple Ainata	Apple Yamouneh	Apple Baalbeck	Cucumber Brital GH	Cucumber Kafardan GH	Grapes Baalbeck	Potato Baalbeck Irrigated	Sugarbeet Baalbeck Irrigated	Tobacco Rasmelhadeth Irrigated	Potato Majdaloun
PRIVATE PRICES										
Gross Output Price (LBP/kg)	600	650	600	400	300	550	200	120	10,000	250
Gross Output Units (kg)	4,000	2,000	2,300	25,000	20,000	750	3,400	7,700	100	2,500
Total Gross Output (LBP)	2,400,000	1,300,000	1,380,000	10,000,000	6,000,000	412,500	680,000	924,000	1,000,000	625,000
Seed (LBP)	0	0	0	780,000	682,000	0	250,000	7,500	50,000	240,000
Water Quantity (cm)	400	375	400	400	400	150	650	1,450	200	540
Water Value (LBP)	48,000	135,000	120,000	50,000	50,000	30,000	78,000	145,000	15,000	85,000
Fertilizers (LBP)	397,000	162,000	135,000	959,000	476,500	140,000	123,000	62,500	46,000	100,200
Manour	350,000	150,000	120,000	0	0	75,000	0	0	0	0
Nitrogen	0	12,000	15,000	99,000	68,500	25,000	80,000	62,500	40,000	95,200
Phosphate	47,000	0	0	0	0	40,000	20,000	0	0	5,000
Potash	0	0	0	0	0	0	0	0	0	0
Soluble	0	0	0	860,000	408,000	0	23,000	0	0	0
Chemicals (LBP)	49,000	49,000	49,000	465,000	281,000	40,000	40,000	39,000	6,000	0
Pesticides	7,000	7,000	8,000	10,000	8,000	25,000	14,000	25,000	28,000	35,500
Herbicides	18,000	18,000	16,000	11,000	11,000	0	6,000	5,000	14,000	12,000
Fungicides	24,000	24,000	25,000	444,000	262,000	15,000	20,000	5,000	0	5,500
Cost of Hired Machinery (3P)	150,000	139,000	145,000	585,000	80,000	39,000	95,000	9,000	14,000	18,000
Land Preparation	75,000	39,000	45,000	135,000	80,000	24,000	25,000	38,000	10,000	50,000
Crop Husbandry	75,000	100,000	100,000	450,000	0	15,000	70,000	25,000	10,000	50,000
Total Labour (LBP)	142,000	275,000	385,000	1,575,000	2,227,000	334,500	70,400	13,000	0	0
Total Variable Cost	786,000	760,000	834,000	4,414,000	3,796,500	583,500	656,400	144,100	354,000	55,500
Gross Margin (LBP)	1,614,000	540,000	546,000	5,586,000	2,203,500	379,000	23,600	436,100	503,000	566,200
Depreciation	25,000	70,000	60,000	1,005,000	1,010,000	25,000	65,000	564,900	497,000	58,800
Interest on Capital	117,900	114,000	125,100	632,000	284,740	87,525	49,230	80,000	15,000	30,000
and Rent	225,000	225,000	200,000	150,000	150,000	250,000	140,000	49,060	56,590	42,465
Total Fixed Cost (LBP)	367,900	409,000	385,100	1,787,000	1,444,740	362,525	254,230	130,000	70,000	150,000
								259,060	141,590	222,465
SOCIAL PRICES										
Gross Output LBP per ton	927,445	927,445	927,445	669,385	669,385	1,116,434	402,475	98,825	2,729,842	402,475
Gross Output LBP per kg	927.445	927.445	927.445	669.385	669.385	1116.434	402.475	98.825	2,729,842	402.475
Total Gross Output (LBP)	3,709,780	1,854,890	2,133,124	16,734,620	13,387,696	837,326	1,368,415	760,955	2729.842	402.475
Seed	0	0	0	777,014	679,389	0	249,043	7,471	272,984	1,006,188
Water Value (LBP)	132,616	124,328	132,616	132,616	132,616	49,731	215,501	480,733	46,753	239,081
Fertilizers (LBP)									66,308	179,032
Manour	350,000	150,000	120,000	0	0	75,000	0	0	0	0
Nitrogen	0	12,687	15,859	104,671	72,424	26,432	84,583	66,080	42,291	100,654
Phosphate	49,692	0	0	0	0	42,291	21,146	0	0	5,286
Potash	0	0	0	0	0	0	0	0	0	0
Soluble	0	0	0	909,266	431,373	0	24,318	0	0	0
Chemicals (LBP)	49,411	49,411	49,411	468,903	283,359	40,336	40,336	39,327	6,344	0
Pesticides	7,059	7,059	8,067	10,084	8,067	25,210	14,118	25,210	28,235	35,798
Herbicides	18,151	18,151	16,134	11,092	11,092	0	6,050	5,042	14,118	12,101
Fungicides	24,201	24,201	25,210	447,727	264,199	15,126	20,168	9,076	0	5,546
Cost of Hired Machinery (3P)	183,344	169,899	177,233	715,043	97,784	47,670	116,118	46,447	12,223	61,115
Land Preparation										
Crop Husbandry										
Total Labour (LBP)	142,000	275,000	385,000	1,575,000	2,227,000	334,500	70,400	144,100	354,000	55,500
Total Variable Cost (LBP)	907,064	781,325	880,120	4,682,513	3,923,944	615,960	821,444	784,159	556,154	676,466
Gross Margin (LBP)	1,614,000	540,000	546,000	5,586,000	2,203,500	379,000	23,600	564,900	497,000	58,800
Depreciation (LBP)	25,000	70,000	60,000	1,005,000	1,010,000	25,000	65,000	80,000	15,000	30,000
Interest on Capital (LBP)	86,460	83,600	91,740	463,467	208,809	64,185	36,102	35,977	41,499	31,141
and Rent (LBP)	225,000	225,000	200,000	150,000	150,000	250,000	140,000	130,000	70,000	150,000
Total Fixed Cost (LBP)	336,460	378,600	351,740	1,618,467	1,368,809	339,185	241,102	245,977	126,499	211,141

Table A12: Zone 8 (Qaa and Hermel)
(in Lebanese Pounds)

Items	Melon Qaa Irrigated	Tomato Qaa Irrigated	Watermelon Qaa Irrigated	Watermelon Qaa Tunnels
PRIVATE PRICES				
Gross Output Price (LBP/kg)	300	200	250	400
Gross Output Units (kg)	3,000	8,000	4,000	4,000
Total Gross Output (LBP)	900,000	1,600,000	1,000,000	1,600,000
Seed (LBP)	16,000	45,000	10,000	45,000
Water Quantity (cm)	900	1,200	900	900
Water Value (LBP)	54,000	72,000	64,000	54,000
Fertilizers (LBP)	221,000	274,000	202,000	178,000
Manour	103,000	105,000	105,000	105,000
Nitrogen	0	53,000	2,000	53,000
Phosphate	18,000	0	30,000	0
Potash	0	0	0	0
Soluble	100,000	116,000	65,000	20,000
Chemicals (LBP)	40,000	45,000	30,000	30,000
Pesticides	15,000	20,000	12,000	12,000
Herbicides	0	0	0	0
Fungicides	25,000	25,000	18,000	18,000
Cost of Hired Machinery (LBP)	35,000	35,000	35,000	40,000
Land Preparation	35,000	35,000	35,000	40,000
Crop Husbandry	0	0	0	0
Total Labour (LBP)	76,000	114,000	52,000	66,000
Total Variable Cost	442,000	585,000	393,000	413,000
Gross Margin (LBP)	456,000	1,015,000	607,000	1,187,000
Depreciation	40,000	50,000	40,000	50,000
Interest on Capital	33,300	43,875	29,475	30,975
Land Rent	60,000	75,000	150,000	150,000
Total Fixed Cost (LBP)	133,300	168,875	219,475	230,975
SOCIAL PRICES				
Gross Output LBP per ton	841,520	584,465	704,199	704,199
Gross Output LBP per kg	841.520	584.465	704.199	704.199
Total Gross Output (LBP)	2,524,559	4,675,717	2,816,794	2,816,794
Seed	17,699	44,828	11,062	49,778
Water Value (LBP)	298,386	397,848	298,386	298,386
Fertilizers (LBP)				
Manour	103,000	105,000	105,000	105,000
Nitrogen	0	56,036	2,115	56,036
Phosphate	19,031	0	31,719	0
Potash	0	0	0	0
Soluble	105,729	122,645	68,724	21,146
Chemicals (LBP)	40,336	45,378	30,252	30,252
Pesticides	15,126	20,168	12,101	12,101
Herbicides	0	0	0	0
Fungicides	25,210	25,210	18,151	18,151
Cost of Hired Machinery (LBP)	42,780	42,780	42,780	48,892
Land Preparation				
Crop Husbandry				
Total Labour (LBP)	76,000	114,000	52,000	66,000
Total Variable Cost (LBP)	702,961	928,515	642,037	675,490
Gross Margin (LBP)	456,000	1,015,000	607,000	1,187,000
Depreciation (LBP)	40,000	50,000	40,000	50,000
Interest on Capital (LBP)	24,420	32,175	21,615	22,715
Land Rent (LBP)	60,000	75,000	150,000	150,000
Total Fixed Cost (LBP)	124,420	157,175	211,615	222,715

Table A13: Zone 9 (Nabatiyeh and Marjayoun)
(in Lebanese Pounds)

Items	Olives Kferhata	Olives Nabatiyeh	Tobacco Adehit	Tobacco Elerez	Tobacco Bent-Jebeil	Wheat Ghasanieh	Wheat Nabatiyeh
PRIVATE PRICES							
Gross Output Price (LBP/kg)	1,500	3,500	10,000	10,000	10,000	450	450
Gross Output Units (kg)	1,500	475	150	150	90	425	628
Total Gross Output (LBP)	2,250,000	1,662,500	1,500,000	1,500,000	900,000	191,250	282,600
Seed (LBP)	0	0	50,000	50,000	30,000	20,000	15,000
Water Quantity (cm)	0	0	16	20	16	0	0
Water Value (LBP)	0	0	40,000	50,000	25,000	0	0
Fertilizers (LBP)	205,000	80,000	65,000	30,000	30,000	12,000	6,000
Manour	115,000	50,000	0	0	0	0	0
Nitrogen	30,000	30,000	20,000	30,000	30,000	12,000	6,000
Phosphate	30,000	0	0	0	0	0	0
Potash	0	0	0	0	0	0	0
Soluble	30,000	0	45,000	0	0	0	0
Chemicals (LBP)	60,000	20,000	0	60,000	40,000	0	25,000
Pesticides	20,000	20,000	0	30,000	20,000	5,000	25,000
Herbicides	20,000	0	0	0	0	0	10,000
Fungicides	20,000	0	0	30,000	20,000	5,000	0
Cost of Hired Machinery (LBP)	60,000	80,000	20,000	25,000	35,000	42,500	70,000
Land Preparation	40,000	65,000	20,000	25,000	35,000	20,000	20,000
Crop Husbandry	20,000	15,000	0	0	0	22,500	50,000
Total Labour (LBP)	200,000	105,000	422,500	430,000	403,000	20,000	20,000
Total Variable Cost	525,000	285,000	597,500	645,000	563,000	99,500	136,000
Gross Margin (LBP)	1,725,000	1,377,500	652,500	855,000	337,000	98,000	49,200
Depreciation	20,000	50,000	50,000	75,000	25,000	25,000	10,000
Interest on Capital	78,750	42,750	65,220	72,563	63,340	111,900	15,300
Land Rent	80,000	150,000	100,000	125,000	140,000	50,000	20,000
Total Fixed Cost (LBP)	178,750	242,750	215,220	272,563	228,340	186,900	45,300
SOCIAL PRICES							
Gross Output LBP per ton	1,802,395	1,802,395	6,488,627	6,488,627	6,488,627	330,917	330,917
Gross Output LBP per kg	1,802.395	1,802.395	6,488.627	6,488.627	6,488.627	330.917	330.917
Total Gross Output (LBP)	2,703,593	856,138	973,294	973,294	583,976	140,640	207,816
Seed	0	0	46,753	46,753	28,052	24,446	18,334
Water Value (LBP)	0	0	5,305	6,631	5,305	0	0
Fertilizers (LBP)							
Manour	115,000	50,000	0	0	0	0	0
Nitrogen	31,719	31,719	21,146	31,719	31,719	12,687	6,344
Phosphate	31,719	0	0	0	0	0	0
Potash	0	0	0	0	0	0	0
Soluble	31,719	0	47,578	0	0	0	0
Chemicals (LBP)	60,504	20,168	0	60,504	40,336	0	0
Pesticides	20,168	20,168	0	30,252	20,168	5,042	25,210
Herbicides	20,168	0	0	0	0	0	10,084
Fungicides	20,168	0	0	30,252	20,168	5,042	0
Cost of Hired Machinery (LBP)	73,338	97,784	24,446	30,557	42,780	51,948	85,561
Land Preparation							
Crop Husbandry							
Total Labour (LBP)	200,000	105,000	422,500	430,000	403,000	20,000	20,000
Total Variable Cost (LBP)	543,997	304,670	567,727	606,163	551,191	114,123	155,449
Gross Margin (LBP)	1,725,000	1,377,500	652,500	855,000	337,000	98,000	49,200
Depreciation (LBP)	20,000	50,000	50,000	75,000	25,000	25,000	10,000
Interest on Capital (LBP)	57,750	31,350	47,828	53,213	46,449	82,060	11,220
Land Rent (LBP)	80,000	150,000	100,000	125,000	140,000	50,000	20,000
Total Fixed Cost (LBP)	157,750	231,350	197,828	253,213	211,449	157,060	41,220

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