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ERADICATION OF ILLICIT CROPS: REHABILITATION OF THE AGRICULTURAL SECTOR IN LEBANON

(A Socio-Economic Survey of the Baalbeck-Hirmil Region)

November 1992

زيادة
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Foreword

This survey was carried out as part of the ESCWA activity on combating the production of illicit crops in Lebanon. The information and data collected have served the joint UNDP/UNDCP/FAO/ESCWA mission in designing an integrated development programme for the area of illicit crops.

ESCWA's economic and social approach for eradicating illicit crops in Lebanon is now considered by all parties concerned as the most reasonable and promising way to achieve a definite eradication of those crops.

The joint ESCWA/FAO Agriculture Division wishes to express its appreciation for the good effort exercised by the team* which carried out the survey and to the Faculty of Agriculture and Food Sciences of the American University of Beirut which led that team.

S. J. Sunna, Chief
Joint ESCWA/FAO Agriculture Division

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* The team was composed of Messrs. Adib Saad, Ahmed Baalbaki and Yousef El-Khalil.

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I. THE CULTIVATION OF ILLICIT CROPS AND THEIR IMPACT ON THE REGION OF BAALBECK-HIRMIL

The cultivation of cannabis was first introduced by the merchants of Zahleh into the areas around their city before the French mandate, which forced them to move this crop to villages in remote northern areas, namely Deir Al-Ahmar and Btedhi; ties of kin and/or business bound these merchants to the people there. This took place between 1926 and 1928.

The areas allotted to this crop soon grew, especially in the north-western areas where resistance to the mandate during the 1920s met with support from the clans of the region. This, reports indicate, is what started the connection between the clan and cannabis cultivation. It was a connection favoured by the heads of these clans, who found in their patronization of the cultivation of cannabis a means of regaining the power they had lost with the end of their role as tax-collectors for the defeated Ottoman sultan. Thus, cannabis cultivation spread.

Because development in the Baalbeck-Hirmil area was marginal during the economic reform era following independence, cannabis remained the choice crop, whereas any other crop entailed the tackling of many risks (i.e., climate vicissitudes, unavailable or expensive agricultural inputs, and unprotected markets, among others). As a result, the area planted with cannabis spread from around 200 hectares (ha) in 1929 to around 6,000 ha in the mid-1960s.[1/,2/]

During the latter part of the 1960s, sunflower was introduced as an alternative to cannabis, and the 6,000 ha previously cultivated with the latter diminished to around 600 ha in 1971. The area of sunflower-growing lands increased from 80 ha in 1966 to 5,300 ha in 1971.[3/] Unfortunately, the decreasing purchasing power of the subsidized price for sunflower, the hectic bureacratic processes involved in obtaining the crop from the farmers and paying them, along with the outbreak of the civil war in Lebanon and the opening of the borders between Egypt and Israel that increased the demand for Lebanese hashish, encouraged the recultivation of cannabis. Under these new conditions, cannabis cultivation reached its peak level between 1985 and 1989. Cannabis cultivation covered an area approximately 15 to 20 per cent of the total cultivated lands in the four district areas of the Beka'a except for Rachaya, and about 33 per cent of the arable lands in these four "cazas" (i.e., 22,000 to 28,000 ha). Thus, cannabis cultivation spread out from the 40 villages it had covered before the civil war, in the region of Baalbeck and Hirmil, to almost all the villages in the northern Beka'a after the war, and reached 16 villages in the district of Zahleh and western Beka'a (southern Beka'a). Farmers from Taraya, Mcheik, and Deir Al-Ahmar (northern Beka'a)

1/ El-Moussawi, Ali. Baalbeck-Hirmil region and cannabis cultivation. Unpublished Ph.D. thesis (1985), p. 181.

2/ Green plan. Report on the project of replacing the illicit crops by legal economic crops, 1971.

3/ Baroud, A. "File of the 1970s, No. 6 on Hashish in Lebanon".

share-cropped the more fertile and less dry lands south-west of Beka'a, where an average yield of 800 kilograms (kg) per dunum (du) of green cannabis would be obtained versus 500 kg in the dry lands of the northern villages. This cut down on the inflated cost of production (irrigation and fuel) and satisfied the increasing demand for illicit crops that followed the Israeli invasion. Table 1 shows the area of cannabis and opium poppy cultivation in these 16 villages from 1986 to 1991. The area cultivated with illicit crops decreased from 1,800 ha of cannabis down to 700 ha; opium poppy area decreased from 90 ha to 60 ha.

Table 1. Areas planted with illicit crops and the number of growers in Zahleh and western Beka'a cazas, 1986 and 1991

Village	Cannabis (dunums)		Opium poppy (dunums)		In[a/]		Out[b/]	
	1986	1991	1986	1991	1986	1991	1986	1991
Ammeek	490	520	100	80	7	7	12	9
Ghaza	400	–	–	–	8	–	6	–
El-Mansura	1 500	850	25	–	18	12	3	–
El-Khuyara	180	–	–	–	–	–	–	–
El-Dakwa	250	–	–	–	–	–	–	–
Hosh El-Harimeh	800	350	2	25	1	11	6	–
Kub Elias	50	–	32	10	3	1	–	–
El-Marge	1 540	700	251	110	38	14	10	5
Bar Elias	2 950	1 500	270	–	28	–	16	–
Kaferzabad	578	170	32	–	35	–	–	2
El-Faour	5 440	1 100	–	5	185	5	–	–
Juwar El-Faour El-Dalhamieh	1 290	1 000	77	50	23	23	9	9
El-Dalhamieh	2 500	700	65	32	51	16	–	8
Ali El-Nahri	210	30	12.5	257	28	38	3	–
Riyak	300	70	25	25	17	3	2	–
Deir El-Ghazal	–	–	15	–	–	–	2	–
Total	18 478	6 990	906.5	594	442	130	69	33

Source: United Nations Economic and Social Commission for Western Asia.

a/ In: number of cultivators from the village.
b/ Out: number of cultivators from outside the village.

After this widespread cultivation of illicit crops and the saturation of the market with these products, especially in 1987 and 1988, profits started to decrease; cannabis and opium poppy cultivation decreased also. According to the survey on the evolution of illicit crop cultivation performed on the villages of Baalbeck and Hirmil, the area of cannabis cultivation inside and outside the villages ebbed from 75,000 du in 1989 to 51,000 du in 1990 and then to 38,000 in 1991, witnessing a decrease of approximately 50 per cent

(table 2). The share-cropped areas outside the villages, especially in the southern Beka'a, decreased during the same years, from 34,000 du to 16,000 du, respectively, i.e., a decrease of 85 per cent. As for opium poppy cultivation in the same villages, the area decreased from 3,312 ha in 1989 to 2,100 ha in 1991, that is, a decrease of 60 per cent (table 2). The number of northern sharecroppers in the south of Beka'a decreased from 44 farmers dealing with cannabis in 1986 to only 4 in 1991 and from 23 dealing with opium poppy to only 1 in the same period (table 3). Integrative Islam, with its strong religious influence, and the individual and family aids offered as an incentive to convert from this cultivation played a major role in decreasing the area of illicit crop cultivation in the plains and hills of the eastern mountain range. The people of these regions, as an alternative, returned to smuggling goods other than drugs to and from the Syrian Arab Republic.

Table 2. Changes in areas planted with illicit crops, 1989-1991
(Dunums)

Drugs		1989	1990	1991
Cannabis:	In[a/]	41 100	35 100	32 400
	Out[b/]	33 700	15 900	5 300
	Total	74 800	51 000	37 700
Opium poppy:	In[a/]	30 920	19 825	19 150
	Out[b/]	2 200	900	500
	Total	33 120	20 725	19 650

Source: United Nations Economic and Social Commission for Western Asia.

Note: Information obtained from 21 villages and towns in the Baalbeck and Hirmil cazas relying mostly on this type of cultivation.

a/ In: Number of cultivators from the village.
b/ Out: Number of cultivators from outside the village.

Table 3. Number of small, medium and large farms planting illicit crops in Zahleh and western Beka'a cazas, 1986 and 1991

Year		Cannabis				Opium poppy			
		Small	Medium	Large	Total	Small	Medium	Large	Total
1986	In[a/]	258	69	35	362	75	40	16	131
	Out[b/]	6	21	17	44	2	9	12	23
1991	In[a/]	10	13	10	33	42	16	13	71
	Out[b/]	-	-	4	4	-	-	1	1

Source: United Nations Economic and Social Commission for Western Asia.

a/ In: Number of cultivators from the village.
b/ Out: Number of cultivators from outside the village.

As for the impact of cannabis and opium poppy cultivation on these regions that had been severely marginalized by the economy, they were prominent in the prosperity of the real estate market and in the construction and commercial sectors that grew with the standard of living. Moreover, the "new rich" started to invest in technologically advanced irrigation projects that were competing with cannabis production, but once more inflation and the stagnation of the fruit and vegetable market compelled the owners, especially in the Ka'a plains (100 projects), to revert, in part, to cannabis cultivation and some to the establishment of rainfed vineyards and olive groves.

Although the profits from illicit crop cultivation were considerable (estimated at 4 billion Lebanese pounds (LL)[4/] in 1991 for cannabis and at LL 9 to 10 billion for opium poppy), they were not able to compensate for the Government's total neglect of the region's infrastructure.

II. STATUS OF ELECTRIC POWER AND DOMESTIC WATER SUPPLY IN THE REGION

According to the survey on the economic and social situation performed on 21 villages in the region of Baalbeck and Hirmil in 1991-1992, there were 4,404 out of 11,124 families without electricity for more than six hours daily, and even the rest received it only for 8 to 12 hours, while only 1,447 families could compensate for this shortage with privately-owned generators (table 4). As for potable water, out of 11,124 families, more than half depend on the local water network of artesian wells, 1,142 families depend on traditional collection wells, and 2,560 families buy cisterns of water daily (table 5).

III. EDUCATION AND HEALTH-CARE FACILITIES IN THE REGION

In the domain of education, 15 out of the 21 villages studied send a quarter or half of their students to schools in other villages. In almost all the villages, the public schools are poorly maintained (tables 6 and 7). As for medical care, out of the 21 surveyed villages, only 8 are provided with the services of a medical doctor, only 6 have a midwife, and only 11 have a nurse (table 8).

IV. ECOLOGICAL AND METEOROLOGICAL FACTORS INFLUENCING THE CULTIVATION OF ILLICIT CROPS

The first factor that determined the kind and location of illicit crop cultivation was water. The high concentration of cannabis cultivation occurred in villages that benefited from surface water diverted by canals from springs in Laboueh, El-Ain and Yammouneh and from the Litani and Orontes rivers. The lack of maintenance of these water canals and their monopolization by armed tribal forces, especially in drought seasons (extending from May till September), caused an increase in the average cost of irrigation water (table 9).

4/ LL 1,000 = $US 1.00.

Table 4. Status of electric power in Baalbeck and Hirmil cazas, 1991-1992

Village	Caza	Families	Weekly official network supply 50hrs	Weekly official network supply 51-100hrs	Private generators	Sharing of local generators
Housh El-Nabi	Baalbeck	450		63	6	
Taraya	Baalbeck	900		56	100	2
Hadath Baalbeck	Baalbeck	250	42		80	
Hezine	Baalbeck	160	42		6	
El-Khodor	Baalbeck	700	42			3
Sareen	Baalbeck	1 100		70		1
Shlifa	Baalbeck	170	42		13	
Mcheik Farms	Baalbeck	370	42		10	
Deir Al-Ahmar	Baalbeck	1 000	42		70	
Boday	Baalbeck	500	42		20	
Majdalon	Baalbeck	87	42		7	
Hosh Tel Safia	Baalbeck	67	42		12	
Shaat	Baalbeck	350		84	50	2
El-Labweh	Baalbeck	450		84	30	100
El-Ain without plain	Baalbeck	850		84	50	120
El-Fakiha El-Jadidat	Baalbeck	600		84	20	300
El-Hirmil	Hirmil	1 500		84	150	
El-Shawagher	Hirmil	120		84	5	
El-Zakba	Hirmil	300		56	30	
El-Kasar	Hirmil	500		84	50	
Al-Ka'a	Hirmil	700		84	10	200
Total		11 124			719	728

Source: United Nations Economic and Social Commission for Western Asia.

Table 5. Sources of domestic water in Baalbeck and Hirmil cazas, 1991-1992

Village	Caza	Number of families	Storage	Collection	Buying	Network
Housh El-Nabi	Baalbeck	450	400	50		
Taraya	Baalbeck	900	90		270	540
Hadath Baalbeck	Baalbeck	250		50	200	
Hezine	Baalbeck	160	160			
El-Khodor	Baalbeck	700	700			
Sareen	Baalbeck	1 100			1 100	
Shlifa	Baalbeck	170				170
Mcheik Farms	Baalbeck	370			190	180
Deir Al-Ahmar	Baalbeck	1 000			200	800
Boday	Baalbeck	500				500
Majdalon	Baalbeck	87		5		82
Hosh Tel Safia	Baalbeck	67		67		
Shaat	Baalbeck	350				350
El-Labweh	Baalbeck	450			50	400
El-Ain without plain	Baalbeck	850			100	750
El-Fakiha El-Jadidat	Baalbeck	600			200	400
El-Hirmil	Hirmil	1 500		300		1 200
El-Shawagher	Hirmil	120		120		
El-Zakba	Hirmil	300		50	250	
El-Kasar	Hirmil	500		500		
Al-Ka'a	Hirmil	700				700
Total		11 124	1 350	1 142	2 560	6 072

Source: United Nations Economic and Social Commission for Western Asia.

Table 6. Distribution of public and private schools in the cazas of Beka'a

Caza	Number of villages	Number of public schools			Number of private schools					Number of inhabitants
		Secondary	Intermediate elementary	Intermediate	Government subsidized Intermediate	Totally private Secondary	Totally private Intermediate elementary	Totally private Intermediate	Total	
Zahleh	45	8	39	-	28	21	13	1	110	132 000
Baalbeck	103	11	62	15	50	19	14	3	174	169 000
Southern Beka'a	36	8	28	2	20	5	4	-	67	56 000
Rachaya	28	1	25	3	2	-	3	-	38	11 000
Hirmil	36	1	5	30	-	-	2	-	38	27 000
Total	248	29	159	50	100	45	36	4	427	395 000

Source: United Nations Economic and Social Commission for Western Asia.

Table 7. Number of students in Baalbeck and Hirmil cazas, 1991-1992

Village	Caza	Families	Students	
			Total	Percentage out of town
Housh El-Nabi	Baalbeck	450	700	60.7
Taraya	Baalbeck	900	1 375	58.2
Hadath Baalbeck	Baalbeck	250	570	57
Hezine	Baalbeck	160	320	53.1
El-Khodor	Baalbeck	700	1 275	35.3
Sareen	Baalbeck	1 100	2 000	30
Shlifa	Baalbeck	170	320	62.5
Mcheik farms	Baalbeck	370	620	45.2
Deir Al-Ahmar	Baalbeck	1 000	2 080	28.8
Boday	Baalbeck	500	1 020	20.6
Majdalon	Baalbeck	87	160	78.1
Hosh Tel Safia	Baalbeck	67	120	66.7
Shaat	Baalbeck	350	1 110	45
El-Labweh	Baalbeck	450	725	20.7
El-Ain without plain	Baalbeck	850	1 700	11.8
El-Fakiha El-Jadidat	Baalbeck	600	1 045	9.1
El-Hirmil	Hirmil	1 500	3 700	27
El-Shawagher	Hirmil	120	270	18.5
El-Zakba	Hirmil	300	750	66.7
El-Kasar	Hirmil	500	575	43.5
Al-Ka'a	Hirmil	700	550	0

Source: United Nations Economic and Social Commission for Western Asia.

Table 8. Status of health care in Baalbeck and Hirmil cazas, 1991-1992

Village	Caza	Number of families	Physicians	Midwives	Infirmaries
Housh El-Nabi	Baalbeck	450			
Taraya	Baalbeck	900	1	1	2
Hadath Baalbeck	Baalbeck	250			
Hezine	Baalbeck	160			
El-Khodor	Baalbeck	700		1	
Sareen	Baalbeck	1 100			1
Shlifa	Baalbeck	170			1
Mcheik farms	Baalbeck	370			
Deir Al-Ahmar	Baalbeck	1 000	1	1	1
Boday	Baalbeck	500	1		1
Majdalon	Baalbeck	87			
Hosh Tel Safia	Baalbeck	67			
Shaat	Baalbeck	350			2
El-Labweh	Baalbeck	450	1		1
El-Ain without plain	Baalbeck	850	1	1	1
El-Fakiha El-Jadidat	Baalbeck	600	2	1	1
El-Hirmil	Hirmil	1 500	8	3	6
El-Shawagher	Hirmil	120			
El-Zakba	Hirmil	300			
El-Kasar	Hirmil	500			
Al-Ka'a	Hirmil	700	1		2
Total		11 124	16	8	19

Source: United Nations Economic and Social Commission for Western Asia.

Table 9. Cost of irrigation water in the production of selected crops

Crop	Cost of water as a percentage of the total cost of production
Cannabis (green)	26
Opium poppy	14
Potatoes	22
Onions	15-36
Grapes	17
Tomatoes	15-40
Wheat	13
Beans	35

Source: United Nations Economic and Social Commission for Western Asia.

Note: 95 families were surveyed.

Because of this high cost of irrigation water in the northern Beka'a, the farmers transferred their cultivation of illicit crops in 1985 to the wet plains in the western Beka'a by renting land there. The water factor is also important in the Beka'a Plain (stretching from the north of Baalbeck up to Al-Ka'a and the Syrian border) where average rainfall is between 200 and 250 millimetres (mm), compelling the farmers to opt for opium poppy cultivation rather than cannabis which is a summer crop requiring additional and frequent irrigations. In the high western hills, where average rainfall is approximately 800 mm, cannabis replaced beans, wheat, barley and apricot, while opium poppy did the same in the lower, warmer regions of Hirmil. Thus cannabis cultivation appeared and consumed 20-33 per cent of cultivated lands, taking the place of sunflower cultivation which had spread until the war.

The farmers traded quality for quantity by growing cannabis on irrigated versus rainfed land. Out of 21 holdings surveyed for 1989, only 5 were rainfed, while in 1990 no rainfed holdings were recorded and in 1991 only 3 rainfed holdings were recorded, out of 41 (table 10).

Table 10. Distribution of rainfed and irrigated cannabis and opium poppy farm holdings classified by size

	1989			1990			1991		
	S	M	L	S	M	L	S	M	L
Cannabis:									
Rainfed	1	1	1	-	-	-	2	-	-
Irrigated	3	1	1	2	10	6	5	9	4
Poppy:									
Rainfed	2	-	-	-	-	-	1	-	-
Irrigated	7	4	-	5	12	5	10	7	3
Total:									
Rainfed	3	1	1	-	-	-	3	-	-
Irrigated	10	5	1	7	22	11	15	16	7

Source: United Nations Economic and Social Commission for Western Asia.

Note: S: Small, M: Medium and L: Large.

V. THE CIRCUMSTANCES AND LIMITATIONS SURROUNDING CULTIVATION OF ILLICIT CROPS

Before starting to estimate the extent of illicit-crop cultivation and the number of holdings it occupies, it is worth while to note two prominent characteristics of land holdings in the Beka'a, i.e., concentration and fragmentation, for it was noticed that 1 per cent of the landowners monopolize 27 per cent of the cultivated lands and 39 per cent manage no more than 4 per cent of these areas.

With reference to the 1970 agricultural census by the Food and Agriculture Organization of the United Nations (FAO) (table 11), the FAO study in 1976,[5/] the field survey in 1991 (on animal production conducted for the International Fund for Agricultural Development [IFAD]), and the present survey on illicit crops conducted in 1992 for ESCWA, the surveyed holdings could be divided as shown in table 12.

When comparing the size of holdings in 1991 to that of the three preceding years, we can conclude that, in the category of small holdings, the average irrigated area is 18 du, the mixed land (both irrigated and rainfed in the same year) is divided between an average of 8 du irrigated and 20 du rainfed. In the category of medium holdings, the average area of the irrigated land is about 50 du and that of mixed land is 40 du irrigated and 50 du rainfed. Finally, in the category of large holdings, the average irrigated land is 250 du; as for the mixed land, the range is 100 to 150 du irrigated and 250 to 500 du rainfed.

5/ Food and Agriculture Organization of the United Nations (FAO). "Enquête agro-économique de la Bekaa Centrale", Rapport AG: DL/Leb/74/00/ - document de travail 4; (Rome, 1976).

Table 11. Classification of holdings by size in Beka'a, 1970

	Computed holdings				Surveyed holdings	
	Number	Percentage	Area (ha)	Percentage	Number	Percentage
Without land	102	0.3	2	–	102	100
< 0.5	4 981	15.4	889	0.3	3 714	75
0.5 - 1	2 952	9.2	2 081	0.8	2 849	97
1 - 2	4 735	14.7	6 730	2.6	4 672	99
2 - 3	3 649	11.3	8 661	3.3	3 566	98
3 - 5	4 694	14.6	17 770	6.8	4 632	99
5 - 10	4 674	14.5	32 349	2.4	4 632	99
10 - 20	2 111	6.5	28 929	11.1	2 110	100
20 - 50	1 578	4.9	47 467	18.2	1 515	96
50 - 100	635	1.9	44 803	17.3	635	100
100 - 200	231	0.7	31 251	12.0	230	100
> 200	95	0.3	39 219	15.1	94	99
Unclassified	1 824	5.7	139	0.1	225	12
Total	32 261	100	260 290	100	28 976	–

Source: Food and Agriculture Organization of the United Nations (FAO) and Ministry of Agriculture, Census of agriculture, Lebanon, 1970.

Table 12. Classification of cannabis farms by size of holdings, 1989-1992

Categories of holdings in du = 1/10 ha	1989	1990	1991	1992
Small holdings				
< 20 du of irrigated land				
100 du of rainfed land	11	7	24	25
Mixed (15 du irrigated and 50 du rainfed)				
Medium holdings				
31 to 150 du of irrigated land				
150 to 300 du of rainfed land	6	19	26	25
Mixed (up to 75 du irrigated and 150 du rainfed)				
Large holdings				
> 150 du of irrigated land				
300 du of rainfed land	2	9	10	7
Mixed (> 75 du irrigated and > 150 rainfed)				
Annual total	19	35	60	57

Source: United Nations Economic and Social Commission for Western Asia.

It is worth while to note that in the 60 land holdings surveyed in 1991, there are only 3 holdings which are solely rainfed, bearing in mind that rainfed crops constituted 30 per cent of the legal crops before the war.[6/] This divergence towards irrigated cannabis can be explained by the discrepancy in profits from this cultivation as compared to that of other crops (table 13), a discrepancy which justifies the risk and cost of production.

The average size of areas cultivated with illicit crops in the three categories of land holdings was as follows:

- In the small-sized holdings, the average area was 1.5 ha of cannabis and/or 0.8 ha of opium poppy;
- In the medium-sized holdings, the average area was 4 ha of cannabis and/or 0.8 ha of opium poppy;
- In the large-sized holdings, the average area was 5 ha of cannabis and/or 4 ha of opium poppy.

Table 13. Cost of production and average return of major crops cultivated in Baalbeck and Hirmil, 1991
(Thousands of Lebanese pounds)

	Total cost of production per dunum (x 1000 LL)	Average return of production per dunum
Cannabis	91	69
Opium poppy	148	352
Potato	319	56
Onion	157	43
Mokti	45	20
Wheat	32.5	2.5
Beans	145	18
Tomatoes:		
Furrow irrigation	180	7.5
Pump irrigation	250	62.5*

Source: United Nations Economic and Social Commission for Western Asia.

* Asterisk denotes loss.

In this context, the degree of cannabis cultivation in 1990 and 1991 that witnessed massive eradication of that crop, appears clearly reduced in comparison to previous years (table 14). This can be explained by the religious influences in the area or probably by an advance in the tech-economies where only a few farmers believe that cannabis cultivation will always compete with other crops.

6/ Amer, Mona; Yaghi, M. Two theses for the Master's degree in social sciences, University of Zahleh, Faculty of Social Sciences (1978 and 1983).

Table 14. Areas planted with illicit crops in Baalbeck and Hirmil, 1989 and 1991

Village	Caza	Numbers of families	Cannabis (du)				Opium poppy (du)			
			1989		1991		1989		1991	
			In	Out	In	Out	In	Out	In	Out
Housh El-Nabi	Baalbeck	450	650				70			
Taraya	Baalbeck	900	3 500	3 000	2 000	100	700		500	
Hadath Baalbeck	Baalbeck	250	6 000		1 000					
Hezine	Baalbeck	160	1 000		500					
El-Khodor	Baalbeck	700								
Sareen	Baalbeck	1 100	500				100			
Shlifa	Baalbeck	170	1 200		800		250		100	
Mcheik farms	Baalbeck	370	2 300	2 500	1 600	1 800	750		1 000	
Deir Al-Ahmar	Baalbeck	1 000	20 000	25 000	23 000	1 000	4 000		3 500	
Boday	Baalbeck	500	2 000	600	1 500	800	4 000		3 500	
Majdalon	Baalbeck	87	2 000	200	800		1 400		1 800	
Hosh Tel Safia	Baalbeck	67	1 200	400	1 200	400	250		200	
Shaat	Baalbeck	350		500			2 000		1 500	
El-Labweh	Baalbeck	450	150				50			
El-Ain without plain	Baalbeck	850					250			
El-Fakiha	Baalbeck	600					100			
El-Jadidat										
El-Hirmil	Hirmil	1 500					1 500	1 000	50	
El-Shawagher	Hirmil	120					200	700		
El-Zakba	Hirmil	300	600	1 500		1 200	300	500		500
El-Kasar	Hirmil	500					5 000			
Al-Ka'a	Hirmil	700					10 000		7 000	
Total		11 124	41 100	33 700	32 400	5 300	30 920	2 200	19 150	500

Source: United Nations Economic and Social Commission for Western Asia.

Finally, when the number of families dealing with illicit-crop cultivation in the regions of Baalbeck and Hirmil was estimated, reference was made to the primary results of the 1987 "Jesuit" study that estimated the number of residents in the cazas of Baalbeck and Hirmil at a gross total of 196,000 in 1987. Adding to that the normal population growth rate, they were predicted to number about 200,000 in 1992. If the gross average of the economical activity is equal to 27 per cent, the number of economically active people should be 54,000. Estimating, in this study, that agriculture employs 25 per cent of them, the gross number of active people in agriculture should be 13,500. The demographic data in this study indicates that 48 per cent of the agricultural population are landholders, thus, it is concluded that there are 6,500 family-holdings in the region studied. As for the percentage of holdings cultivated with cannabis during the peak of the latter half of the 1980s, it amounted to 80 per cent of total land holdings in the region, that is 5,200 families. The average number of family members working in these holdings is estimated at 21,000 (5,200 X 4 units of work). To this should be added the number of seasonal workers needed at peak times for scarring the poppies, harvesting raw opium, etc. (table 15).

VI. AREA UNDER CULTIVATION WITH CANNABIS AND POPPY AND AGRICULTURAL LABOUR INVOLVED

In the category of irrigated small holdings, there are 3,185 land holdings (6,500 X 49/100 = 3,185, where 49 per cent is the share of small holdings having an area of less than 3 ha, according to the 1970 census and to the field survey). The gross area cultivated with cannabis is 1,194 ha (3,185 X 1/4 X 1.5 = 1,194 ha, where one fourth of the 60 farms surveyed indicated that they cultivate cannabis and 1.5 was the average area planted to illicit crops in the small holdings category). The gross area cultivated with opium poppy was 1,274 ha (3,185 X 1/2 X 0.8 = 1,274, where half of the farms surveyed were cultivated with opium poppy and 0.8 was the average area cultivated with opium poppy in the small holdings category).

In the medium-sized irrigated holdings, there were 2,665 farms (6,500 X 41/100 = 2,665). Of the medium holdings, 41 per cent ranged from 3 ha to 15 ha. The gross area cultivated with cannabis reached 3,550 ha (2,665 X 1/3 X 4 = 3,550 ha, where one third of the farms surveyed were cultivated with cannabis and the average area was 4 ha). The gross area cultivated with opium poppy was 513 ha (2,665 X 1/4 X 0.8 = 513 ha, where one fourth of the farms surveyed were cultivated with opium poppy and the average area was 0.8 ha per holding).

As for large holdings, there were 650 (6,500 X 10/100 = 650, where 10 is the percentage of holdings with an area no more than 15 ha). The gross area within these holdings that is cultivated with cannabis is 1,080 ha (650 X 1/3 X 5 = 1,080 ha, where one third of the farms surveyed were cultivated with cannabis and the average area was 5 ha). The gross area cultivated with opium poppy is 1,300 ha (650 X 1/2 X 4 = 1,300 ha, where half of the farms surveyed were cultivated with opium poppy and the average area was 4 ha).

Hence, the gross total area cultivated with illicit crops in 1991 in the Baalbeck and Hirmil regions reached 8,911 ha (5,824 + 3,087 = 8,911 ha) where the total area cultivated with cannabis and opium poppy was 5,824 ha (1,194 + 3,550 + 1,080) and 3,107 ha (1,274 + 533 + 1,300) respectively.

Table 15. Labour distribution in farms, 1991

	Family employment (HLU)[a/]			Seasonal labour (days)									Number of working families by month										
	<2	2-5	>5	0	<50	51-200	201-500	501-1000	1001-2000	2001-3000	3001-5000	>5000	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Small farms (24)**																							
Irrigated (1-30)	2	11	3	4	2	5	4	-	-	-	-	-	-	-	5	10	9	6	6	4	3	3	-
Nonirrigated (< 100)	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Irrigated and nonirrigated (< 15 & < 50)	1	3	3	2	2	1	1	-	-	-	-	-	-	-	1	2	4	1	-	-	-	-	-
Medium farms (26)[b/]																							
Irrigated (31-150)	3	8	11	3	4	5	7	2	2	1	-	-	1	2	30	11	17	10	9	10	3	1	1
Nonirrigated 151-300)	-	2	-	1	-	-	-	1	-	-	-	-	1	-	-	2	2	2	2	1	1	-	-
Irrigated and nonirrigated (< 75 & < 150)	-	2	-	-	1	1	-	-	-	-	-	-	-	-	-	1	1	3	4	3	-	2	-
Large farms (10)[b/]																							
Irrigated (> 15)	-	2	6	-	-	-	1	-	2	2	2	1	-	4	4	7	6	6	5	6	2	4	-
Nonirrigated (> 301)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irrigated & nonirrigated (> 75 & > 150)	-	1	1	-	-	-	1	-	-	-	1	-	-	1	2	2	2	2	2	2	1	1	-
Total	6	29	25	11	9	12	14	3	4	3	3	1	2	7	22	35	41	31	28	27	10	11	1

Source: United Nations Economic and Social Commission for Western Asia.

a/ HLU: Human Labour Unit.
b/ Number of farms surveyed.

In addition, the area cultivated with illicit crops in the cazas of Zahleh and the western Beka'a is 760 ha (700 ha for cannabis and 60 ha for opium poppy). It should be noted that these estimations were made after the stagnation of the market for illicit crops in 1988 and after the partial eradication in 1991 that destroyed 32 per cent of these crops (28,000 ha).

VII. THE SOCIO-ECONOMIC CONDITIONS OF THE FARMERS OF THE REGION

The local political situation and the macroeconomic environment increased the farmers' attraction to illicit crops. This was especially the case for small-scale farmers; for them, the returns of 1.5 ha of cannabis or 0.8 ha of opium poppy were 1.2 and 3.2 times, respectively, the minimum wage in Lebanon in 1991.

In the marginalized region under study, increased revenues were possible through the growing of illicit crops, while legal farming was suffering from stagnation and harsh competition from foreign products dumped by neighbouring countries.

This survey revealed that in the beginning of 1991 only one out of ten large-scale farmers in the Baalbek area abandoned illicit farming, while the rest resumed their activities. With regard to small-scale holdings, there were small areas planted with illicit crops (1.5 ha of cannabis and 0.8 ha of opium poppy), allowing the areas to remain unnoticed most of the time. Illicit-crop farming in the 1980s was no longer an exclusively tribal activity entertained in remote areas of the Hirmil area but was increasingly adopted by large-scale landowners in the central plain of Baalbek. This study has revealed that while illicit-crop farming decreased by 60 per cent in 1991 in Hirmil, after the repressive actions of 1991, this decrease was only 28 per cent in Baalbek, 10 per cent in Zahleh, and less than 8 per cent in the case of northern farmers.

The irrigated area within each holding was used as a criterion to classify farms as small, medium and large. Differences in holdings indicated the importance of used working capital, but no significant differences in relation to adopted technologies and equipment or to productivity were noticed among these three classes of farms. Market stagnation and economic inflation, together with risks related to the dumping of foreign imports, made large-scale farmers reluctant to expand or to use new techniques. The highly uncertain prospects of legal farming compelled even the well-equipped and more modern farms to shift to growing illicit crops or to nonirrigated agriculture. The costs of production are very similar in the various categories of farms, especially medium and large ones. The costs of ploughing, seeding, plant protection, and harvesting are very close in all three categories.

As far as the marketing of products is concerned, larger farms showed a higher tendency and ability to store their output in anticipation of more suitable opportunities, whereas small farms had to sell their output at harvest time.

Land-leasing costs, however, vary considerably according to geographical locations. These costs can vary by eightfold between lots in the fertile and humid west Beka'a and those of the arid northern lots. Irrigation costs were free for one third of the farms surveyed of LL 2,500 per hour for lots that

use nearby rivers, LL 5,000 for farmers who own their wells, and of LL 7,500 for water bought from neighbouring wells.

Growers of cannabis had a tendency to lease the harvesting of their crop in 1988 to other parties whereas in 1990 they favoured doing their own harvesting and even marketing the output when possible (table 16).

Many farmers tended to rent land or water to improve production in 1989-1990. By 1989, 85 per cent of illicit-crop growers tended to rent land or water. In 1990, as demand for illicit crops fell, only 35 per cent of all cannabis growers and 50 per cent of opium poppy growers rented either water or land (table 17).

Because of the relatively high cost of irrigation, wheat-growing took the upper hand in areas of free or near-free irrigation. Wheat-growing, furthermore, increased in 1991 when the Government raised its buying price of wheat to LL 245 per kg.

The present study shows that mechanization was used to a certain degree by all 60 families surveyed for 125 crops. In this context, and with respect to harvesting, one should note that harvesting of drugs is a manual job whereas mechanized harvesting is limited to wheat, barley, beans and potatoes and was adopted by almost all the farms surveyed.

In the absence of government and cooperative, positive roles, the introduction of new agricultural techniques to the studied region occurred in limited individual cases where modern techniques were brought from specialized suppliers of inputs. The reluctancy of wealthy farmers to adopt new techniques is linked to a lack of managerial skills accompanied by pessimism with respect to agriculture in general. The current status of the geographical distribution, size and specialization of agricultural cooperatives in the Beka'a cazas for the year 1991 is shown in table 18.

As for labour, an important factor to note is the movement of Syrian seasonal workers who remain in the region for months in seasons of intensive agricultural work, especially in summer. Another important factor is the settling of Bedouins, among whom the poorest and the largest families have started to specialize as agricultural workers.

Farmers' hiring of labour intensifies in specific periods, as when bleeding the opium poppy crop or harvesting apricots, which must be undertaken within a period of 10 to 15 days. During these periods, the wages of female workers almost double, and the costs of opium poppy farming increase to such a degree that farmers are willing to give away one third of this yield in exchange for harvesting only.

As for availability of labour on the farm, the study revealed that about half of the surveyed families are endowed with three human labour units (HLU). In our calculations, one HLU corresponds to one available male or female. Children between 10 and 15 years were considered one third of an HLU. A wife was counted between one third and two thirds of an HLU according to her level of activity in the household. People over 65 years of age were counted as one third of an HLU. The survey showed that 40 per cent of families were endowed with six or more HLUs.

Table 16. Marketing arrangements for products of illicit crops, 1989-1990

Forms of sharecropping	Cannabis						Opium Poppy					
	1989 (n=8)			1990 (n=18)			1989 (n=13)			1990 (n=19)		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
Sharecropping	2	1	1	1	1	1	1	-	-	-	-	-
Crude	-	2	-	-	1	2	8	4	-	4	5	-
Processing	1	1	-	1	7	5	-	-	-	-	-	-

Source: United Nations Economic and Social Commission for Western Asia.

Note: n: number of farms interviewed.

Table 17. Number of farms renting facilities for illicit-crop production, 1989 and 1990

Forms of sharecropping	Cannabis						Opium Poppy					
	1989 (n=8)			1990 (n=18)			1989 (n=13)			1990 (n=19)		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
Land renting	1	1	-	-	-	-	-	-	-	-	-	-
Water buying[a/]	-	-	-	-	1	-	-	-	-	-	1	-
Both	2	2	1	-	2	4	4	2[a/]	-	1	5[a/]	2

Source: United Nations Economic and Social Commission for Western Asia.

Note: n: number of families.

a/ Water buying: returns from water buying is a share in the yield.

Table 18. Geographical distribution, size and specialization of agricultural cooperatives in the Beka'a cazas, 1991

Cazas	Number of participants			Functioning												Total
				Non				Poor				Good				
	10-30	30-75	>75	Gen.	SA	SV	SE	Gen.	SA	SV	SE	Gen.	SA	SV	SE	
Zahleh	8	5	8	–	4	3	2	1	4	2	1	2	1	1	–	21
Baalbeck	9	6	2	7	1	1	–	3	2	–	–	1	1	1	–	17
Southern Beka'a	4	3	1	3	–	2	–	2	–	–	–	–	1	–	–	8
Rachaya	6	1	–	–	–	1	–	5	1	–	–	–	–	–	–	7
Hirmil	3	2	1	4	–	–	–	–	2	–	–	–	–	–	–	6
Total	30	17	12	14	5	7	2	11	9	2	1	3	3	2	–	59
		59			28				23				8			

Source: The registry of the "Cooperative Section" in Zahleh and the three cooperative directors at the central Beka'a, October 1991.

Notes: Gen.: In general.
SA : Special animals.
SV : Special vegetables.
SE : Special equipment.

Furthermore, familial and tribal kinships are relied upon for opium poppy harvesting periods when trustworthiness becomes an important issue because of the easy possibility of stealing the light, but expensive, opium poppy product.

The cannabis farmers tend to lease or sell their crop in the field in order to avoid the harvesting troubles. Thus, they have sufficient cash that enables them to undertake other agricultural operations, especially during the autumn and winter when their resources become more limited and they face a higher demand for cash for schooling and heating. Despite the cheap labour offers and mechanization that lowers the cost of labour, the farmer still hesitates to get involved in legal farming due to the possible risks in marketing the crops.

The main sources of income for families in the northern Beka'a before the war included revenues from cannabis culture, employment in the army, the family's self-sufficient crop production with some additional production for marketing. The constitution of these sources changed after the war when, due to cases of illicit-crop farming and drug-dealing, the farmers had some savings that were invested in middle- and large-size holdings and hence contributed to raising the standard of living and led the farmers to diversify their crops in such a way as to satisfy the market demand. Therefore, Lebanese agriculture witnessed, during the war and from the mid-1970s until the Israeli invasion in 1982, a period of prosperity characterized by the development of food industries, packing, refrigeration, storage and export to the Gulf countries after the oil boom.

Thus, illicit farming contributed highly to the accumulation of preliminary capital that allowed for the modernization of agriculture in the northern Beka'a and the diversification of crops that enabled the farmer to satisfy various demands and avoid the risks of certain crops.

VIII. CANNABIS PRODUCTION

Over and above the absence of law and order and marketing facilities that have encouraged cannabis production, there were other encouraging factors that were alluded to earlier. Such factors include the relatively low labour requirements needed for its production: one dunum of cannabis requires only nine man-days of labour per season, which represents half of all the production costs. The other half goes for soil preparation, irrigation, and fertilizers. The total cost of production was estimated at LL 91,000 in 1991 and the average net return per dunum is estimated at LL 69,000. For comparison, wheat production requires two man-days of labour per dunum and a total production cost estimated at LL 40,000, giving a net return of LL 2,500 (it should be pointed out that the price of wheat used for these calculations was the August 1991 price, before the 55 per cent increase by the government). Another comparison is with tomato production which requires 27.5 man-days of labour per dunum, production costs estimated at LL 180,000, and net returns estimated at LL 70,000. Potato production requires seven man-days of labour per dunum, production costs estimated at LL 359,000, and net returns of LL 16,000. The cost of spraying is another clear indicator of the attractiveness of cannabis cultivation: spraying a dunum of cannabis costs only LL 1,000, while the cost for the same area of wheat is LL 2,000, for tomatoes LL 8,000 and for potatoes LL 12,000.

The advantages of cannabis production were attractive to about 80 per cent of the farmers. This is especially true for poorer farmers who normally produce other, less attractive crops whose prices are further depressed by dumped produce from external markets. In the districts of Zahleh and the western Beka'a, where hashish production was introduced only recently, this proportion is only about 50 per cent. The profits from hashish production did not escape the notice of the non-farming community and was not restricted to poor farmers or those with diminutive farms. Wage workers and professionals as well as farmers with large farms understood very well that money could be made in this field of production where competition from neighbouring countries was virtually non-existent.

Table 19 shows the costs of production and the profits to be made from one dunum of cannabis.

IX. OPIUM POPPY PRODUCTION

Half a century after the introduction of cannabis, opium poppy saw the light of day in Lebanon's agriculture. However, it was forced to wait for the collapse of the State security apparatus before it could become widespread in the Hirmil region at the beginning of the 1980s. The presence of security forces in the warm plains of the Hirmil prior to the war contributed to the delay in the appearance of opium poppy in these plains where the climate favours its production. The upper plains of the Hirmil where cannabis is traditionally grown was found to be too cool for opium poppy production. The 1986-1987 opium poppy prices of $US 400 to 500 per kg were an encouraging factor in the spread of its production in the area. Some 3,500 ha of opium poppy were planted in 1988-1989. This high production depressed opium prices to an average of $US 100 to 160 per kg during 1989-1991. Although opium poppy planting began in the tribal regions of Hirmil, it later moved to the Baalbeck and western Beka'a regions where wealthy farmers were capable of paying for the "armed rent" or protection.

Because opium poppy, unlike cannabis, is a winter crop, it was able to replace many important crops such as cereals, wheat, barley, apricot, and the winter potato crops.

Sources in the Judicial Police Narcotics Office estimated the area planted with opium poppy to be less than 500 ha in 1988. These areas, according to the same sources, expanded to 1,500 ha in 1991. The survey conducted for this study revealed that in 1991 some 2,250 of the total 5,200 growers in the region were involved in opium poppy production. The same survey found that in some 21 villages involved in cannabis production, some 2,000 ha were estimated to be allocated to this crop, 115 ha of these belonging to the 60 families interviewed for this study.

The flooding of the market and depressed opium poppy prices contributed to a halt in its spread to the eastern Beka'a which falls under the control of religious fundamentalists. The entrenchment of opium poppy production in the area influenced consumption patterns. In some areas, opium poppy itself entered the consumption cycle and even became a source of addiction in some circles and villages. This contributed positively to the anti-drug campaigns organized by the fundamentalists.

Table 19. Expenses and revenues associated with one dunum of cannabis

West Baalbeck	1991 prices (thousands of Lebanese pounds)
Costs	
Land rent[a/]	15
Tilling	8
Seeds	1
Fertilizers	5
Labour	
- Weeding and removal of males (2 days)[b/]	5
- Planting, irrigating and fertilizing (1 day)	8
Water for irrigation (3 to 4 irrigations)	15
Planting costs	57
Income to farmers if crop is sold in the field	70
Profits	13
Harvesting and collection	16
Transportation	2
Processing (500 kg) four days labour[b/]	16
Harvesting and processing costs	34
Total costs	91
Income from processed output	
3.6 kg of first class flower	120
3 kg 2nd and 3rd class	10
40 kg seed	30
Total	160
Profits for farmer who processes his own produce	69

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to landowner where land is rented or opportunity cost of not renting this land when land is owned by the farmer himself.

b/ Indicates labour conducted by young female workers earning much lower salaries than their male counterparts.

In 1991, in a perimeter of one dunum, opium poppy production costs reached LL 148,000 (54 per cent of which comprised labour costs), and average profits reached LL 352,000 (table 20). No other crop was that profitable.

Medium- and large-scale farmers capable of employing the necessary amount of cheap, young, female labour (at LL 3,000/day), as well as the small-scale farmers with families large enough that outside labour is not required, became the principal growers of opium poppy. Since "armed rent" is an important element in the production costs and since it is within the reach of large-scale farmers, such farmers are the overriding majority of opium poppy growers in Lebanon (10 per cent of the large-scale farmers are responsible for 40 per cent of total production). In fact, in 1991 some farmers in the Baalbeck area had up to 150 dunums cultivated with opium poppy. They were employing up to 300 labourers a day for a two-week period during which the opium poppy was processed. This is reminiscent of the latifundias in Latin America.

Table 20. Expenses and revenues associated with one dunum of opium poppy

West Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	15
Tilling	8
Seed	1
Fertilizers	10
Pesticides	10
Water for irrigation (4 times)	20
Labour costs	
- Weeding and interspacing (4 days)[b/]	16
- Planting, fertilizing and irrigating (1 day)	8
- Extraction of resin (15 days)[b/]	60
Total production costs	148
Income from sale of 2.5 kg crude opium	500
Profit from one dunum	352

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to landowner where land is rented or opportunity cost of not renting this land when land is owned by farmer himself.

b/ Refers to female labour usually paid half the wages of male labour.

On the other hand, marketing opium poppy is not as easy as planting it. Prices could as much as triple within a period of a few weeks. Prices for one kg of opium ranged between LL 100,000 and LL 225,000 in 1990 and LL 100,000 and LL 300,000 in 1991. However, after partial destruction of some crops by security forces in the Beka'a and the subsequent decline in the supply of opium poppy, prices exceeded LL 700,000 per kg. Another marketing problem is related to the nature of the sale of opium poppy, where the farmer surrenders his crop to the buyer and is paid only after the latter has processed the opium

poppy and sold the goods. There are only 10 processing units (kitchens) in the country, and the largest share of opium poppy profits is restricted to the owners of these kitchens and to those who market their products, who are often one and the same.

Processed opium poppy is transformed into heroin and is sold in different forms in markets that harbour different demands. Such markets include North America for "Net" heroin, Italy for "Brown Sugar", Spain for "Blanc Sale", and France for "Blanc Creme" and "Blanc Brun." Naturally, prices vary depending on the purity of the product. For instance the pure "Net" for North America is worth almost twice the "Blanc Sale" for Spain.

X. PRINCIPAL LEGAL CROPS IN THE REGION

Projections from the field survey of 21 villages in the cazas of Baalbeck and Hirmil and the feasibility study of a fruit and vegetable packing plant conducted by the Arab Organization for Agricultural Development[7/] reveal that opium was planted in some 2,250 ha and cannabis to some 8,000 ha in 1991 spread over some 141 villages. The map of crops in the Baalbeck and Hirmil areas looks as follows:

1. Wheat, barley and other cereals in the eastern plain (region of Khodhor Seraiin), the western plain (region of Deir Al-Ahmar and Shmistar) and to a lesser extent in the northern part of the plain.

2. Potatoes in the eastern plain and around Baalbeck and Al-Ka'a.

3. Apricots limited to the northern part of the plain (Laboueh to Hirmil).

4. Grapes in the eastern and southern plain and to a lesser extent in the north of Hirmil.

5. Apples in the eastern and northern plains (Laboueh and Ain).

6. Vegetables in the Hirmil and Laboueh regions.

7. Cannabis and opium poppy in the western plain, Laboueh and Al-Ka'a.

The instability of supply and demand, especially after the 1992 burning of the crops by narcotics authorities, is orienting farmers towards crops that can be well preserved. This allows the farmer to be in control of the sale of his produce during the period when prices suit him best. During the harvest period, which ranges from a few weeks to a few days, fruit and vegetable farmers are forced to sell at low prices dictated by major buyers and justified by the latter as the natural response of markets to oversupply. Consequently, farmers are turning away from these crops and towards cereals and legumes such

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7/ Arab Organization for Agricultural Development (AOFAD). Technical and Economical Feasibility Study for the Establishment of a Fruit and Vegetable Packing and Cold Storage Centre, League of Arab States (Khartoum, 1991).

as beans, chickpeas and lentils. More and more farmers in the eastern plain are also planting almonds which can be marketed either green or dry during many months. Similarly, farmers are planting "snake cucumber" (a type of cucumber), honeydew melons and watermelons, crops that are less demanding and are easier to store and market. Farmers, both large- and small-scale, are also leaning towards crops that require less labour and can be marketed during a long period, such as cabbage and cauliflower.

The marketing problems of principal and well-developed crops continue to hurt most farmers in the Beka'a, especially for potato, onion, garlic and apricot as well as important vegetable crops such as tomato. For instance, in 1991 potatoes (LL 150 per kg) were sold at a 30 per cent loss, garlic (LL 200 per kg) at a 10 per cent loss and tomatoes (LL 75 kg) at a 12 per cent loss.8/

Advanced agricultural projects developed with capital emanating from the war, emigrants, smuggling and commerce increased the areas planted with vegetables in the Beka'a by 40 per cent between 1975 and 1988 and to the expansion of areas planted with tubers by 140 per cent.9/ In the accompanying appendices entitled "Vegetable Production in the Beka'a" and "Fruit Production in the Beka'a" areas planted with vegetables and other crops are clearly indicated. These areas are as follows: potatoes (9,400 ha), tomatoes (2,700 ha), onions (2,400 ha), snake cucumbers, honeydew melons and watermelons (3,000 ha), garlic (1,000 ha), beans (1,000 ha), cabbage and cauliflower (1,300 ha), peas (700 ha) and lettuce (600 ha). According to these estimates and to two other sources: (a) the results of our 21-village survey; and (b) a study by Michel Jorr on crop distribution in the Beka'a,10/ the total cultivated area in the northern Beka'a (Baalbeck and Hirmil) in 1991 was estimated at 45,000 ha, of which 20 per cent is cereal. In the irrigated portion (14,000 ha), 17 per cent are planted with apricots, 7 per cent with potatoes and another 4 per cent with grapes. These sources also reveal that about 75 per cent of irrigated land (10,500 ha) is planted with narcotics, keeping in mind that some winter crops such as potatoes are also cultivated along with narcotics since the latter is a summer crop. Table 21 shows expenses and revenues for one dunum of potatoes.

It is interesting to note that potato-growing attracted most of the attention of the new and advanced agricultural projects. While it had expanded from 4,500 ha in 1961 to 8,652 ha in 1974, it increased after the war to 11,600 ha in 1981. Throughout the 1980s and 1990s the area planted with potatoes varied substantially, from as low as 7,000 ha in 1987 to as high as

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8/ Although it goes against economic reason to continue planting at a loss, sociological factors such as honour and dignity associated with not letting land fallow encourages farmers to plant and thus remain in the social circles with the hope of improved prices the following season.

9/ See note 6.

10/ Saade, Riad, Le Commerce du Levant, Agricultural Report 39 (May 1992), p. 52.

Table 21. Expenses and revenues associated with one dunum of potatoes

Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	6
Tilling and seed preparation	15
Seed	160
Machine planting	5
Fertilizers	50
Pesticides	12
Water for irrigation	80
Labour costs	
- Fertilizing, irrigating and harvesting	25
- Tractor for harvesting	6
Total production costs	359
Income from sale of output (2.5 tons)	375
Profit from one dunum	16

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to landowner where land is rented or opportunity cost of not renting this land when land is owned by farmer himself.

13,121 ha in 1988.[11/] These wide variations reveal the risk to which the farmer is exposed from uncontrolled and unpredictable dumping practices throughout the year. In fact, the farmer seems to be constantly losing from such operations. If farmers invest some LL 360,000 dunums only to regain LL 16,000 in four months, they would be better off buying treasury bills which, at an interest rate of 24 per cent, would yield LL 21,800 during the same period. As such, if the farmer does not plant and rents his land and its water, he could gain another LL 86,000 for a total of LL 107,800 which makes his loss about 30 per cent of his original costs. Farmers, however, continue cultivating their land in order to keep the members of the household working (constituting about 15 per cent of total costs) and to maintain the functionality of their installations while always hoping for better prices in the coming season. This seems to be his only choice in the absence of market controls, anti-dumping regulations and uncontrolled borders. It is also interesting to point out that due to the low labour cost (15 per cent) compared to water and machinery costs (22 per cent), cultivation of potatoes remains a suitable activity for medium- and large-scale farmers. Table 22 shows expenses and income for one dunum of beans.

11/ Ibid.

Table 22. Expenses and revenues associated with one dunum of beans

Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	6
Tilling and mechanized sowing	11
Seed	20
Fertilizers	8
Pesticides	9
Water for irrigation	50
Transportation	7
Labour costs	
- Weeding or herbicides (2 days)[b/]	10
- Irrigating (1.5 days)	12
- Tractor for harvesting	12
Total production cost	145
Income from sale of output 225 kg	163
Profit from one dunum	18

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to landowner where land is rented or opportunity cost of not renting this land when land is owned by farmer himself.

b/ Refers to female labour usually paid half the wages of male labour.

After the widespread eradication of the 1992 opium poppy crop, it was observed that bean production was increasing. A 1989 study of 19 farming units revealed that only one was cultivating beans. A similar study involving 35 units revealed that beans were cultivated in 12 units in 1990, 16 in 1991, and 18 in 1992. Mechanization of harvesting facilitated replacement of opium poppy by beans after pressure was imposed by security forces. The owners of bean harvesters would harvest neighbouring fields and receive the straw produced by the process as payment. Since cultivation of beans requires extensive irrigation, farmers were not encouraged to plant beans unless they were sure of water availability. This is why the spread of bean production came to large- and medium-scale farms first and did not reach small ones until the pressure from security forces left them no option but to replace narcotics with other crops. The possibility of choice in terms of selling beans green or dry, depending on the market, was another factor encouraging small-scale farmers to switch from opium poppy to beans. This is especially true for small-scale farmers who operate irrigated plots with their own family labour and do not incur labour costs. Currently, markets are being flooded with imported beans, which lowers its price and renders the activity less

interesting, especially for medium- and large-scale farmers who incur labour costs regardless of the market price of the output. When the product is sold dry, water and labour costs are paid, profits from one dunum of beans reach the level of LL 18,000. This makes large- and medium-scale farmers hesitant to invest LL 163,000 to regain only LL 18,000 five months later. Profits from the same dunum increase by LL 60,000 where water is available from artesian wells in the farmer's field and is not paid for. Table 23 shows expenses and revenues for one dunum of wheat.

Table 23. Expenses and revenues associated with one dunum of wheat

Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	5
Tilling	5
Seed	2.5
Fertilizers	4
Pesticides	2
Water for irrigation	3.5
Labour costs	
- Irrigation, fertilizing and transport (1 day)	8
- Harvesting against straw	0
Total production costs without straw	30
Harvesting not paid by straw	10
Total production cost with straw	40
Income from sale of output	
Wheat only (without straw) (250 kg)[b/]	32.5
Wheat with straw	42.5
Profit from one dunum without straw	2.5
Profit from one dunum with straw	2.5

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to landowner where land is rented or opportunity cost of not renting this land where land is owned by farmer himself.

b/ Wheat was sold at LL 130 per kg shortly before the Government announced the raising of the subsidized purchasing price to LL 265 per kg. Middlemen reaped the benefits of this measure which came too late in the season.

Due to the low profit rate associated with wheat and barley cultivation, such activity is more prevalent in large- and medium-scale farms where mechanization is widespread. Since such cultivation is not labour-intensive, small-scale farmers prefer engaging their family labour in other, more profitable activities. The absence of encouraging pricing policies is an important factor in the low profitability of wheat and barley production. The LL 130 per kg set for 1991 was hardly encouraging, especially in view of the volatility of the Lebanese pound. Wheat and barley cultivation therefore remains an unattractive activity restricted to areas that are close to water supplies, requiring less work and not interfering with other crops. The area planted with wheat increased in the region of the 21 villages surveyed from 800 ha in 1989 to 1,650 ha in 1991 after the opium poppy eradication efforts. In the 60 parcels studied in the context of this survey, areas planted with wheat doubled in the period between 1989 and 1991. The rate of improvement of wheat and barley cultivation is similar to the national rate, which had declined earlier and was replaced by illicit crops only to improve after the security measures and then recover its original level. Table 24 shows expenses and revenues for one dunum of non-irrigated snake cucumber.

Table 24. Expenses and revenues associated with one dunum of snake cucumber

Kasarnaba	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	6
Tilling	6
Seed	8
Weeding	7
Pesticides	2
Labour costs	
Seeding and harvesting (4 days)	16
Total production costs	45
Income from sale of output	
500 kg of snake cucumber	60
Rent for grazing after harvest	2
Total income	62
Profit from one dunum	17

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to the landowner where land is rented or opportunity cost of not renting this land when land is owned by farmer himself.

Most medium-scale farmers found refuge in the cultivation of rainfed crops when their illegal crops were eradicated. Snake cucumber, requiring virtually no water and no more than four days of labour per dunum, was the most popular. In 1991, planting one dunum of snake cucumber required only LL 45,000 of investment and had a profit rate of 38 per cent although this rate was a little higher in 1989. Naturally, this encouraged the cultivation of snake cucumber, especially in large-scale farms, in 1990. The increase in snake cucumber output encouraged its processing into dill snake cucumber both at home and at the small processing plants in the Kasarnaba region. Some such plants became well-equipped, large-scale enterprises exporting to the Arab countries, especially the Gulf. It should also be noted that the local market is often flooded with Syrian snake cucumber produced at lower cost due to well-organized Syrian agricultural and cooperative sectors. Syrian commercial and monetary policies allow its merchants to reap higher profits from exports, which further encourages the merchants to sell their products in Lebanon. Table 25 shows expenses and revenues for one dunum of irrigated onions.

Table 25. Expenses and revenues associated with one dunum of irrigated onions

Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	6
Tilling and land preparation	6
Seed	25
Fertilizers	20
River water for irrigation	20
Pesticides	4
Labour costs	
- Hand seeding (4 days)[b/]	12
- Irrigating (1.5 days)	12
- Harvesting (5 days)[b/]	20
- Weeding (4 days)[b/]	12
Total production cost (only river water)	137
Well water for irrigation	40
Total production cost (well water)	177
Income from sale of output (2.5 tons)	200
Profit from one dunum (river water)	63
Profit from one dunum (well water)	23

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to the landowner where land is rented or opportunity cost of not renting this land where land is owned by farmer himself.

b/ Refers to female labour usually costing less than male labour.

Despite the high costs associated with the cultivation of onion (LL 177,000 per dunum for well-irrigated fields and LL 137,000 per dunum for river- irrigated fields), small farmers are heavily involved in cultivating this crop for several reasons: (a) labour constitutes a relatively high portion of total production costs (32 to 42 per cent) which allows the household to efficiently use its labour; (b) onion constitutes an essential element in the Lebanese diet and is therefore always in high demand, assuring the farmer that he will be able to sell his output; (c) onions can be easily preserved and sold by the farmer when the market and its prices are most convenient to his needs, usually during August and September; and (d) local availability of cheap and good- quality Syrian seed. It is also interesting to note that parcels planted with onions for small-scale farmers range between 10 and 15 dunums and those for large-scale farmers between 60 and 150 dunums. Onion cultivation was also further encouraged by the establishment of two high-quality drying and processing plants on the eve of the war. Although this cultivation decreased during the war and the period of cultivation of illicit crops (reaching as low as 1,000 ha) in 1987, it improved again, reaching some 2,400 ha in 1991. Profits are estimated to be about 31.5 per cent for fields irrigated by river water and 11.5 per cent for fields irrigated by water from artesian wells. Table 26 shows expenses and revenue for one dunum of irrigated tomatoes.

Table 26. Expenses and revenues associated with one dunum of irrigated tomatoes

Baalbeck	1991 prices (thousands of Lebanese pounds)
Production costs	
Land rent[a/]	6
Tilling and land preparation	6
Seed and/or seedlings	15
Fertilizers	20
Well water for irrigation	100
Pesticides	8
Labour costs	
- Hand seeding (2 days)[b/]	6
- Irrigating (2.5 days)	20
- Harvesting and packing (15 days)[b/]	45
- Weeding (4 days)[b/]	24
Total production cost (well water)	250
Total production cost (river water)	180
Income from sale of output (2.5 tons)	187.5
Profit from one dunum (well water)	-62.5
Profit from one dunum (river water)	7.5

Source: United Nations Economic and Social Commission for Western Asia.

a/ This is either rent paid to the landowner where land is rented or opportunity cost of not renting this land where land is owned by farmer himself.

b/ Refers to female labour which usually costs less than male labour.

Tomato cultivation has a high labour-input element (38 to 52 per cent) which normally would be popular among small-scale farmers but irrigation costs are high. Consequently, small-scale farmers cultivate tomatoes only in those parcels where water availability is high and assured. However, a more determining factor for the entry into tomato cultivation is the nature of the fruit which does not preserve well and must be sold immediately upon harvesting; thus the farmer must submit to prevailing market prices, which are often influenced by dumping practices caused by imports from neighbouring countries. In the autumn of 1991, tomatoes were sold at LL 75 per kg, which in fact translates into a loss of LL 25 per kg for well-water-irrigated crops and a profit of only LL 4 per kg for river-irrigated crops. Even this profit is too small compared to the family labour invested in tomato cultivation, reaching some 53 per cent of total production costs. It is interesting to note that tomato cultivation expanded in the well-irrigated, large-scale farms in the city of Baalbeck where farmers were taking risks by cultivating tomatoes. They continued such cultivation in order not to let their human and capital resources idle. Table 27 shows the account of the cost of one dunum of tobacco.

Table 27. Cost of production and revenue of one dunum of tobacco

Baalbeck-Hirmil	1991 prices (thousands of Lebanese pounds)
Rent of rainfed land	15
Wear of pipes and other implements	15
Plowing (3 times)	25
Seedlings	20
Water	15
Fertilizers	15
Labour salary	
- Planting (6 days female labour + 1 day male labour)	50
- Harvesting and transplanting (12 days female labour)	50
- Drying (5 days female labour)	25
Total cost of production	230

Source: United Nations Economic and Social Commission for Western Asia.

The subsidized price from the tobacco monopoly of an average produce is 3,000 X 100, or LL 300,000. The average revenue of 1 du of tobacco is LL 70,000.

Noticeable is the fact that the cost of labour constitutes approximately 56 per cent of the total cost of production, and that the average revenue reaches 30 per cent. Cannabis cultivation competes with that of tobacco in the cost of production, if the cost of agricultural and industrial labour is disregarded (see account of the cost and revenue of cannabis, 44,000 as compared to 105,000). It also competes in its decreased requirement of labour (9 days as compared to 23). Because the average revenues are the same for the two, no competition exists on that score. The advantage that tobacco cultivation does enjoy is a guaranteed buyer of the produce, the Government, and at yearly scheduled times as well. Another advantage that tobacco cultivation can enjoy, especially where large or poor families of small- and medium-sized holdings are concerned (in the Baalbeck-Hirmil area they may number some 3,000 families or so) is that the price of tobacco offered by the monopoly can compensate for the difference in the number of days of labour required (23 - 9 = 14 days). This entails the raising of the price to $US 4.00, rendering tobacco cultivation profitable, and thus a competitor of illicit-crop cultivation.

Assuming that the initial capital is provided through a 15-year loan with an equal life span, and given an interest rate of 13 per cent, the cost of capital in the first five years would be:

(44 X 1.84) + (40 X 1.63) + (1.44 X 43) + (1.28 X 31) + (1.13 X 44) = 298.

Table 28 shows the account of the cost and revenue of one dunum of rainfed vineyards.

Table 28. Cost and revenue of one dunum of rainfed vineyards

	1991 prices (US dollars)
1. Cost of planting and maintenance for a 5-year period preceding production:	
a. First year:	
Rent of land	10
Two plowings (1 deep plow, 2 plows)	9
Digging of 60 holes for planting (one day's labour)	20
Planting	5
	$44
b. Second year:	
Rent	10
Plowing and weeding	15
Organic fertilizers	15
	$40

Table 28. (continued)

	1991 prices (US dollars)
c. Third year:	
Rent	10
Plowing and weeding	15
Grafting (90 per cent of 1 day's skilled and 1 day regular labour)	18
	$43
d. Fourth year:	
Rent	10
Plowing and weeding	15
Late grafting (10 per cent of seedlings)	3
Pruning	3
	$31
e. Fifth year:	
Rent	10
Plowing and weeding	15
Pruning	4
Organic fertilizers	15
	$44

Source: United Nations Economic and Social Commission for Western Asia.

Table 29 shows the cost of production calculated according to stable prices in 1991.

Table 29. Cost of production calculated according to stable prices, 1991

	1991 prices (US dollars)
Rent	10
Plowing and weeding	15
Fertilizers	15
Spraying of pesticides	15
Labour wages (pruning, tying, defoliating, and spraying -- 4 days)	50
(Harvesting, packaging and transportation (4 days)	30
Total cost of production for one year	$135

Source: United Nations Economic and Social Commission for Western Asia.

The capital and operating costs for one year are: 135 + 19.5 = $154.5

Assuming that an average produce for one year is estimated at 600 kg and that the average area planted with cannabis to be substituted in small-sized holdings is 15 du, the average produce in a small-sized holding becomes 600 X 15 = 9,000 kg.

As the average cost of production for a 15-du piece of land is 15 X 154.5 = $2,317.5, the average cost of 1 kg in a small-sized holding becomes 2,317.5/9,000 = $25.75. Also, for the offer of substitution given a farmer to be tempting, it ought to provide the same yearly profit as the cultivation of cannabis, i.e., 69 X 15 = $1,035.

Thus, the price of the crop should reach at least 2,317 + 1,035 = $3,352.5, and the price of 1 kg should reach 3,352.5/9,000 = 37.25.

The hesitation of the farmer to replace a profitable cannabis crop with vineyards is understandable in the light of the absence in 1991 of governmental control and proper and fair contracts between the farmers on the one hand, and the alcoholic beverage industries on the other, the price of one kg offered the farmer decreased to approximately 30 cents.

XI. CONSTRAINTS FACING THE FARMERS OF THE REGION

Legal farming in Lebanon faces a serious lack of profitability linked to various market and institutional problems that have intensified with war and the accompanying destruction, fragmentation, and increased barriers against the free movement of labour and goods. The farmers surveyed in this study see legal farming as the least profitable enterprise when compared to illicit farming or to non-farming activities. Most farmers see poppies and cannabis as the most profitable crops. A legal activity ranking after these, according to the surveyed farmers, is the employment of the family's children in the public sector (table 30). This indicates the lack of profitability in other farming activities, the average wages in the Lebanese public sector ranging between $US 100 and $150 per month.

While the end of hostilities and the increased power of the legal authorities have allowed the massive destruction of illicit crops by 1991-1992, the profitability of agriculture in Lebanon is hindered by several constraints. When asked about the main problems facing agriculture, the surveyed farmers stressed market stagnation, the high price of inputs and equipment, irrigation and infrastructure problems, and the lack of adequate extension programs (table 31).

On the public level, the administration in Lebanon faces critical problems such as lack of control and the absence of a reliable agricultural policy. These problems are worsened by the increasing public debt and seriously hamper the ability to provide basic services or adequate extension programmes.

The freeze on hiring in the public sector since 1985 has, in turn, negatively affected the Ministry of Agriculture which suffers from numerous vacancies. The Ministry's divisions are without Directors and are severely understaffed. The divisions of "Crop Resources", "Extension", and "Forests and Natural Resources" are only 50 per cent, 77 per cent and 75 per cent staffed, respectively. The Ministry's administration is 75 per cent staffed in the region studied.

Table 30. Most profitable activities for farming families in a closed agricultural market

Most profitable activity	Small	Medium	Large	Total
Opium culture	17	10	14	41
Cannabis culture	7	11	3	21
Government employment of children	4	4	2	10
Stock farming	2	-	-	2
No useful culture currently	1	2	-	3
Greenhouses	1	-	-	1
Cherries culture	1	-	-	1
Cement works	1	-	-	1
Drug-dealing	1	-	-	1
Livestock dealing	1	-	-	1
Pisciculture	1	-	-	1
Apricot culture	1	-	-	1
Vegetables culture	1	1	1	3
Free trading	-	1	-	1
Potatoes culture	-	1	-	1
Apiculture	-	1	-	1
Horticulture	-	1	-	1
Any irrigated culture	-	1	-	1
Anise	-	1	-	1
Viticulture	-	1	-	1
No response	2	1	-	3

Source: United Nations Economic and Social Commission for Western Asia.

Table 31. Main constraints hindering development of agriculture according to the farmer

Constraint	July 1992			
	Small	Medium	Large	Total
High price of inputs and equipment	13	17	-	30
Shortage of water	5	6	-	11
Cost of water	3	2	2	7
Monopoly of irrigation networks	4	2	-	6
Shortage of agricultural roads	6	-	-	6
Market stagnation	4	1	-	5
Lack of agricultural extension programmes	1	4	-	5
Absence of land reforming	4	1	-	5
High interests on credit	2	1	2	5
Legal interdiction of illicit crops	2	1	1	4
Absence of government agricultural policy	1	3	-	4
Noncontrolled imports	-	-	2	2
Inadequate photosynthetic products	-	2	-	2
Non-availability of mechanization means	-	2	-	2
Monopoly of dealers	-	1	-	1
Depreciation of currency	-	1	-	1
High cost of manpower	-	1	-	1
Cold weather and its destruction	-	1	-	1
Destruction of the irrigation pipelines	1	-	-	1

Source: United Nations Economic and Social Commission for Western Asia.

Agriculture's concentration on classical crops, for instance, and the failure to introduce new cash crops, is due to the farmers' lack of information concerning growing techniques, production functions, prices and profitability, with an almost complete absence at the government level. In this context, the public Agricultural Research Institute (an autonomous board attached to the Minister of Agriculture) aims at undertaking agricultural research at various levels through eight regional stations, of which three are in the Beka'a valley ("Tel Amara" conducts research on soil, water and crops, "Terbol" on animal production, and "Kfardan" on semi-irrigated crops). War, however, has caused almost complete stoppage of the activities of these institutes. All the stations face severe shortages of qualified personnel on

the technical and the administrative levels. The number of researchers dropped to one quarter and that of engineers to half the pre-war numbers. The budgets and credits allocated to the stations, furthermore, are negligible when compared to the damage inflicted upon the buildings, laboratories, and equipment and to the costs incurred from the shortages in water and electricity.

Another problem facing agricultural development in Lebanon concerns land ownership. While the high share of small properties out of total properties constitutes a serious obstacle to scale production, efficient irrigation and mechanization, the absence of extension programmes and the poor performance of cooperatives are not compensating for this constraint through providing appropriate technologies or cooperative use of mechanization.

Irrigation, as already noted, is a major problem constraining agricultural development, according to the surveyed farmers. They identify expensive fuel, maintenance of the pumping machines, lack of drained water, badly-maintained draining systems, and monopolizing of drained water by more powerful neighbours as the main difficulties concerning irrigation. Only 10 of those surveyed encountered no irrigation problems because of their easy access to nearby rivers (table 32).

Table 32. Main irrigation problems in the various categories of agricultural holdings, 1991-1992

High cost of fuel and maintenance	18
Lack of drained water	16
No problems due to proximity of rivers	10
Monopolizing of drained water pipelines	8
Bad maintenance of drainage systems	8
High cost of pumping machines from wells	2
Unequal amounts of water in sharing	1
High cost of well-graving in special regions	1
Bad landscaping	1

Source: United Nations Economic and Social Commission for Western Asia.

The market for agricultural inputs is held by a limited number of companies which can enjoy relatively high levels of profits. These companies' profits from installing greenhouses and drip irrigation systems and from selling chemicals are estimated at 50, 55 and 75 per cent, respectively. The price of agricultural machinery can increase by more than 40 per cent if the repayment is due over a period of two years. Small farmers can pay prices 20 to 40 per cent higher than large farmers for agricultural inputs if repayment is due after the harvest. The absence of governmental control and extension programmes, furthermore, increases the power of these companies and gives them an important role in Lebanese agriculture. Besides supplying inputs, these companies are often the source of credit and are consulted for the feasibility of agricultural projects and the treatment of various crop diseases. They

organize various extension programmes to promote their products. Complaints are often made about the inadequacy of the treatments advanced by some of these companies, and questions are raised concerning the safety of the pesticides which they sell when the active ingredients are rarely labelled.

An important constraint against agricultural development in Lebanon is the lack of credit. This study shows that 58 per cent of the farmers surveyed do not have access to credit from any source and that none have loans from commercial or specialized banks (table 33). In fact, in spite of the large number of banks operating in Lebanon (including the region under study), the agricultural sector gets a minimal share of total banking credit, which has constituted less than 2 per cent of total banking credit since 1985 and was as low as 1.4 per cent in 1991.

Table 33. Sources of agricultural credit by type of holding, 1991-1992

Sources	Small	Medium	Large	Total
Do not get loans	15	14	6	35
Agricultural companies at a 20 per cent interest per season	5	7	4	16
Well owners	1	1	-	2
Fuel dealers	1	-	-	1
Money lenders at 20 to 40 per cent interest per season	2	4	-	6
Total	24	26	10	60

Source: United Nations Economic and Social Commission for Western Asia.

Specialized medium- and long-term agricultural credit institutions are:

1. The "Banque de Credit Agricole, Industriel et Foncier", a medium- and long-term bank with a public-sector share of 40 per cent, was founded in 1945 and stopped allocating credit in the late 1960s;

2. The National Union of Cooperative Credit was founded to support small-scale agriculture on the technical and financial levels and is presently short of funds;

3. The National Bank of Agricultural Development, a specialized medium- and long-term bank with a government share of 50 per cent was announced by a 1977 constitutional decree and is not yet operating.

The banks' objectives have been stated as "modernizing and developing agriculture through financing agricultural projects in plant and animal production and projects of transforming and marketing agricultural products."

As for private sources of credit, companies and merchants dealing in agricultural inputs and machinery, as well as money lenders, are an important and expensive source of loans to farmers. Of those farmers surveyed who have access to credit, 64 per cent get loans from these companies at a rate of around 20 per cent for one season, while 25 per cent of them have access to money lenders at interest rates ranging between 20 and 40 per cent per season.

The lack of profitability characterizing agriculture in the region is worsened by major market deficiencies such as the lack of storage and packing facilities, the role of middlemen, and the limited number of buyers of agricultural output, as well as competition from dumped foreign products with an almost complete absence of efficient farmer cooperatives, all of which seriously affect the bargaining power of farmers.

A potential demand outlet for agricultural output lies in agro-industries. The development of these industries has been hampered, however, by the absence of a clear governmental policy concerning the control and regulation of agri-businesses in general together with the shortage of credit, the lack of a sufficient, processable domestic supply suitable for processing, and the cheaper, imported products. While some agro-industries like wineries and factories of arak satisfy most of their needs from local supplies, others like dairy industries and food-canning firms rely very little on local products.

XII. INCENTIVES TO PROMOTE LEGAL FARMING

Restraining the growing of illicit crops requires providing profitable alternatives to farmers. To increase the profitability of agricultural enterprises in the studied region would demand action to overcome most of the obstacles discussed in the previous section. A successful policy in this context would have to provide the proper incentives to attract legal farmers that should be assured of adequate returns through future contracts, the provision of adequate information and extension programmes concerning the most profitable crops, as well as access to inputs, collective mechanization and credit at reasonable prices, and the marketing of their agricultural output. Given the fragmentation of land and property, one should stress here the useful role of cooperatives as an important tool that can help policy makers achieve their aims. In this framework, members of these cooperatives would have to undertake legal farming in order to benefit from services provided by the cooperatives.

XIII. ROLE OF NATIONAL AND INTERNATIONAL ORGANIZATIONS

A policy aimed at combating the growing of illicit crops in Lebanon will have to operate in a country coming out of long years of war with a complete absence of Government from the planning scene. Besides providing law and order and forbidding the growth of illicit crops, the Government must provide the basic infrastructural needs to ensure market efficiency while controlling

monopolies at the input and output levels. An adequate policy must provide a successful interaction between the various agricultural agents and institutions (farmers, the ministry of agriculture, research institutions, cooperatives) with the rest of the economy and the national and international organizations (credit institutions, agro-industries, non-governmental organizations, international bodies). This must be conceptualized through a long-term global perspective that requires changes on various levels given the low standard of living and the lack of services in the region.

Study and research must be devoted to identify the most profitable crops and to develop applied technologies to reduce their inputs and maximize outputs. Also research is needed for the introduction of new crops adapted to grow well in the region as well as the choice of appropriate technologies.

Given the serious lack of banking credit to farmers, a policy priority should be to ensure capital at reasonable interest rates to efficient farmers through medium- and long-term financial institutions.

Developing agriculture in the studied region should also address other market facilities concerning grading, packing, transportation and storage, supervising standards of quality and hygiene (specially in relation to food-processing), and exportation. These facilities should be accessible to farmers at competitive prices.

Furthermore, utmost attention should be devoted to ensuring the marketing of agricultural output while reducing the high levels of risk and uncertainty that face the farmers at present. This can be done through future contracts, development of agro-industries and export markets. In this context, the policy should seriously confront the dumping of subsidized foreign agricultural products through more efficient border control and a more serious imposition of the agricultural calendars.

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