

TCP/LEB/3101

TECHNICAL COOPERATION PROGRAMME



LEBANON



**Damage and Early Recovery Needs
Assessment of Agriculture, Fisheries and
Forestry**

November 2006

Special Emergency Programmes Service
Emergency Operations and Rehabilitation Division
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, Italy

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Front cover photos: Damage to the crop, livestock, fisheries and forestry sectors. *Mission members and J. Stephan.*

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Abbreviations and Acronyms

CBO	Community-based organization
CHF	Non-profit international development organization (community, habitat and finance)
FAO	Food and Agriculture Organization of the United Nations
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GPS	Global positioning system
IDAL	Investment Development Authority of Lebanon
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
IMF	International Monetary Fund
LRA	Litani River Authority
MDGs	Millennium Development Goals
MoA	Ministry of Agriculture
NDO	National De-mining Office
NGO	Non-governmental organization
OWL	Other wood lands
TCP	Technical Cooperation Programme
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNMACC	United Nations Mine Action Coordination Cell
USAID	United States Agency for International Development
UXO	Unexploded ordnance

Summary

Between 12 July and 14 August 2006, large-scale hostilities broke out in southern Lebanon. On the Lebanese side, the conflict resulted in more than 1 187 deaths, 4 398 injuries and large-scale destruction of infrastructure, disruption of essential services and displacement of people. It was estimated that over one million people were displaced during the period of the conflict. In the wake of the United Nations Resolution 1701, cessation of hostilities came into effect on 14 August 2006, allowing for the return home of a large majority of displaced persons and the initiation of preliminary damage and needs assessments in the affected communities across Lebanon.

The Ministry of Agriculture (MoA) of Lebanon officially requested the assistance of the Food and Agriculture Organization of the United Nations (FAO) on 22 August 2006 to conduct a damage assessment in the agriculture and fisheries sectors, considering this activity a priority exercise for all the subsequent sector-related recovery and rehabilitation activities to be initiated. FAO headquarters fielded a first exploratory mission to the country to assist the Government of Lebanon in the identification of preliminary recovery needs, and to prepare for the consecutive launching of a full-scale assessment mission funded through an FAO Technical Cooperation Programme (TCP). Considering the massive impact of the hostilities on the well-being of tens of thousands of families in the rural and agricultural setting, the mission was fielded in order to: (a) evaluate the overall damage caused to the farming and fishing communities; and (b) elaborate an early recovery programme for the immediate needs of the most vulnerable farming and fishing communities in the affected areas. This early recovery programme is foreseen to be implemented with donor support within the coming six to 12 months.

The mission started its work in Beirut on 29 September 2006. After an intense series of field visits to the affected areas, including interviews with farmers and fishers, a substantial number of documents and reports were reviewed and working sessions and meetings held with government entities, United Nations (UN) agencies, bilateral cooperation and donor agencies, non-governmental organizations (NGOs), civil society representatives and the private sector. During the assignment, the mission maintained full transparency of its operations and approach and kept continuous contact with the counterpart team from MoA, the Prime Minister's Recovery Coordination Bureau, main government entities concerned with emergency and recovery, UN Resident Representative, United Nations Development Programme (UNDP), United Nations Mine Action Coordination Cell (UNMACC), other UN agencies and, in particular, with the Donor Community. The mission concluded its work with a wrap-up workshop on 27 October chaired by the Minister of Agriculture, and with a wide audience of over 80 participants. After a thorough review by the in-house technical services, the final assessment report was cleared by FAO headquarters, and is presented in this publication.

The military bombardments lasted almost five weeks and were directed mainly at southern Lebanon and the southern suburbs of the capital Beirut. These are precisely the areas with the highest poverty indicators in the country. South Lebanon is highly dependent on agriculture, which represents the main source of income in this part of the country; half the working population in the south earns its living entirely from agriculture, which constitutes, overall, almost 70 percent of the total household income. The conflict affected the sector directly in terms of physical damage to crops and equipment through direct bombing and the destruction of greenhouses, but, more importantly, indirectly in terms of lost markets and labour opportunities.

The major damage was caused through the impossible access to the fields during the 33 days of bombing, as farmers fled their villages and left their crops and animals unattended. The interruption in the care of crops and animals was responsible for a large portion of the income/production losses. Most of the agricultural workforce, including foreign labourers, fled the governorates of South Lebanon and Nabatiyeh. Those who remained were unable to work as mobility was restricted. The war took place at the peak time for the harvest of crops (mainly stone fruits and potatoes) destined for export, but much of this year's harvest perished on the ground, as bombing forced farmers to abandon their lands, and transport to market became impossible. It was reported that trucks attempting to transport agricultural products to market were hit several times by air raids. According to agricultural wholesalers, MoA and the Investment Development Authority of Lebanon (IDAL), restrictions on movement reduced the flow

of fruit and vegetables to Lebanese consumers by three-quarters and reduced expected annual exports by some 15-20 percent (around US\$20-25 million). Furthermore, many agricultural fields and pastures were rendered useless because of being inaccessible until unexploded bombs littering the land could be removed or exploded. Clearing the land from these unexploded bombs will be essential to enable the reconstruction of agriculture-based livelihoods in large areas of southern Lebanon (at least 25 percent of the cultivated area is contaminated). Just in the two governorates of southern Lebanon, the overall quantity of production loss (tree and field crops) – not being harvested or marketed due to the hostilities – amounts to 187 395 tonne, of which 129 968 tonne are from tree crops (69 percent) and 57 427 tonne from field crops (31 percent). The total financial losses (tree crops and field crops) due to physical damage and loss of harvest of crops in the two governorates of southern Lebanon amount to approximately US\$94.458 million, of which about 76 percent relates to tree crops and the rest to field crops. Overall, the total financial damage to the sub-sector of crop production is estimated at around US\$232 million, of which just about 16 percent is attributed to direct physical damage.

The conflict has also weakened the productive capacity of animals through death of stock and decrease in production – due to the forced rural exodus and related abandonment of animals and lack of feed and healthcare during and after the hostilities. The outbreak of the war and its aftermath has slowed down livestock rearing and processing activities, resulting in the immobility of workers and loss of employment opportunities. As a direct consequence of the hostilities, 3 050 head of dairy cattle, 1 250 bulls, 15 000 head of goats and sheep, 18 000 beehives and over 600 000 broilers were lost. The assessment estimated the livestock sub-sector financial loss (physical and income loss) at US\$21.861 million. With respect to fisheries, the most serious damage in the port of Ouzaii resulted in the loss of 328 boats with their gear, the auction hall, cafeteria, meeting rooms, workshop and boat yard. The total damage is estimated at US\$3 million. The damaged cooperative in Aabde sustained repair costs of an estimated US\$30 000. Targeting of the trout farms at Hermel in the Bekaa Valley caused losses of about 300 tonne of fish. The overall sub-sector financial loss was estimated at US\$9.730 million. For the forestry sub-sector, the estimated damage (physical and financial) is roughly around US\$16 million, corresponding to around 2 300 ha of destroyed forest land. The assessed damage and losses to the agriculture, fisheries and forestry sub-sectors totals around US\$280 million.

With the loss of income from harvests and lost animal produce, many farmers have become *heavily indebted* as they usually repay their debts during the harvest period (May-October) to secure credit for the following planting/production season. This year, their ability to repay these debts has been reduced to the minimum, making it impossible to start the new cropping cycle due to the *lack of working capital*. There is much concern that this will lead to a *downward spiral of debt and poverty* for the Lebanese farmers.

While overall the agricultural sector is expected to bounce back quickly, the same is not necessarily true for the livelihoods of war-affected vulnerable rural households. As stated above, many households will remain burdened by asset/harvest/income losses over the medium term and may also suffer from the loss of other sources of income. Therefore, as a priority, assistance should target the lack of *working capital*, which poses a greatest threat to the recovery of the agricultural sector. The early recovery projects recommended below are largely designed to address the critical situation of accumulated debt and unavailability of needed working capital amongst the farming communities of south Lebanon, through appropriate supply of indispensable farm inputs and implements – working capital in kind – crucial to kick-start revitalization of the sub-sectors. These recommended early recovery projects have been prepared to cover urgent needs. The project proposals, however, do *not aim at covering the huge financial losses of the agricultural sector*, but represent the technical judgment of the mission for a first pragmatic and operationally feasible set of priority initiatives for urgent implementation within the coming 6-12 months – especially for the recovery of the most vulnerable farming communities – and with a high probability of attracting donor funding.

- Establishment of an Emergency and Early Recovery Coordination Unit for agriculture-based livelihoods: The strengthened coordination function will establish a platform for regular meetings, information-sharing and data collection and will encourage collaboration in joint rapid livelihoods and agriculture assessments, creating synergies, linkages and partnerships between various actors.
- Emergency assistance to small-scale farmers to resume farming through provision of necessary farm inputs: Providing farmers with minimum agricultural inputs (seed and seedlings, fertilizers, pesticides, small irrigation equipments, etc.) will help resume their agricultural activities. Coordination between FAO/MoA, UNMACC, NDO, the Lebanese army and the concerned municipalities will be established to locate contaminated fields and prioritize clearance of unexploded ordnances (UXOs) to coordinate with early recovery initiatives.
- Emergency assistance for the recovery of smallholder horticulture: The objectives are to re-initiate horticulture production and increase farmers' revenues in the fruit and vegetable sector by optimal use of the production factors, improving product quality to better respond to market demand and supporting new marketing channels for agricultural products.
- Emergency assistance to war-affected, resource-poor livestock keepers in south Lebanon: The most urgent interventions will be carried out on restocking and distribution of animals (cattle, goats, sheep, horses and chicks) and beehives. Emphasis will also be placed on accompanying measures that have the greatest potential to contribute to rapid improvements of livestock productivity in the affected areas.
- Emergency assistance for the early recovery of fishing communities: The assistance would address the most urgent early recovery needs not yet covered by donor support: in Ouzaii – to design and construct a modern fish landing and sales complex; in Aabde – to repair the damage to the cooperative auction hall and retail facilities; in Hermel – to provide fish eggs and feed to resume production.
- Post-war Forest Cover Damage Assessment Study (satellite imagery): The objectives are to assess, from satellite images, the exact locations and extent of forest and other wooded land burned or affected by the hostilities, and to propose site-specific mitigation efforts.

Beyond the early recovery stage, a specific medium- to long-term recovery and development strategy will be formulated – through a parallel FAO consultancy – with the objective to: (1) delineate in detail the needed bridging guidelines between the early recovery stage and medium- to long-term policy and strategy reforms required to modernize the sector; and (2) assist MoA in the preparation of a priority medium-/long-term Strategic Action Plan for the agriculture sector and a strategy document for the Paris III donor conference to be held in January 2007. The assignment will: (a) identify the medium- and long-term policy/strategy implications of the proposed early recovery programme for the different types of farming/fishing activities; (b) in the light of the current post-conflict situation, recommend policy changes which are politically and institutionally feasible and might support smallholder agriculture, particularly in south Lebanon; (c) identify key stakeholders of the commodity chains affected by the conflict; and (d) elaborate policy instruments/changes through which capacity-building support over the medium-term could contribute to overall sector and export supply chain recovery.

Mission Background

Between 12 July and 14 August 2006, large-scale hostilities broke out in southern Lebanon. On the Lebanese side, the conflict resulted in more than 1 187 deaths, 4 398 injuries and large-scale destruction of infrastructure, disruption of essential services and displacement of people. It was estimated that over one million people were displaced during the period of the conflict. In the wake of the United Nations (UN) Resolution 1701, cessation of hostilities came into effect on 14 August 2006, allowing for the return home of a large majority of displaced persons and the initiation of preliminary damage and needs assessments in the affected communities across Lebanon.

Agriculture is the most important source of income in the rural areas of south Lebanon, and most families either conduct or participate in agricultural production and/or animal husbandry for their livelihoods. The July/August 2006 conflict took place at the peak of the tourist and crop harvest season, affecting the farming and fishing sectors directly in terms of physical destruction, but, more importantly, indirectly in terms of lost harvests/markets and labour opportunities.

Considering the massive impact of the hostilities on the well-being of tens of thousands of families in the rural and agricultural setting, the mission was fielded in order to:

- (a) evaluate the overall damage caused to the farming and fishing communities; and
- (b) elaborate an early recovery programme for the immediate needs of the most vulnerable farming and fishing communities in the affected areas.

This early recovery programme is foreseen to be implemented with donor support within the coming six to 12 months.

Operations and Acknowledgements

The mission¹ started its work in Beirut on 29 September 2006. After an intense series of field visits to the affected areas, including interviews with farmers and fishers, a substantial number of documents and reports were reviewed and working sessions and meetings held with government entities, UN agencies, bilateral cooperation and donor agencies, non-governmental organizations (NGOs), civil society representatives and organizations and the private sector. The mission concluded its work with a wrap-up workshop on 27 October that was chaired by the Minister of Agriculture. After a thorough review by the technical services, the final report was cleared by the Food and Agriculture Organization of the United Nations (FAO) headquarters.

During the assignment, the mission maintained close and continuous contact with the counterpart team from the Ministry of Agriculture (MoA), main government entities concerned with recovery, UN Resident Representative, United Nations Development Programme (UNDP), United Nations Mine Action Coordination Cell (UNMACC), International Labour Organization, United Nations Industrial Development Organization (UNIDO) and other UN agencies, as well as with the FAO Resident Office.

The mission would like to express its deep gratitude and appreciation to all those from various institutions and agencies who provided fruitful inputs and insights. The mission would like to thank MoA and its Director-General, Dr Ghattas Akl, as well as the entire ministry staff for their dedicated and continuous support. In particular, the mission would like to thank Ms Amal Salibi for her extraordinary assistance in her function as the mission's agro-economist. Furthermore, the mission would like to thank the FAO Lebanon Representation Office for the continuous and very efficient operational support throughout the duration of the assignment, in particular, the FAO Assistant Representative (Programme) Ms Solange Matta-Saadé, Mr George Nahri, Ms Mona Khoury and Mr Issa Saad. Lastly, special thanks go to the colleagues in the Special Emergency Programmes Service (TCES) at FAO headquarters for the organization and follow-up of the mission.

¹ *The mission was composed of Albert T. Lieberg (team leader), Abdelhaq Hanafi (crops), Chedly Kayouli (livestock), Hedi Hadri (forestry) and David James (fisheries).*

FINDINGS AND RECOMMENDATIONS¹

I. DAMAGE ASSESSMENT

A. Pre-war Sector Description

A.1 Socio-economic background

Lebanon is a small (10 452 km²) upper-middle-income country, with a GDP per capita of US\$4 360. Its population is estimated at 4-4.6 million, of which 88 percent is urban. The average family size is 4.8 individuals, with significant regional and social disparity, and 11 percent of the families having more than eight members. About one-third of the population is concentrated in Beirut and its suburb. The rest of the population is distributed in the five other Mouhafazat (governorates or districts) as set out in the table below.

Population distribution per Mouhafazah

Mouhafazah*	Population	Percent
Beirut	403,337	10
Beirut suburbs	899,792	22
Mount Lebanon	607,767	15
North Lebanon	807,204	20
South Lebanon	472,105	12
Nabatiyeh	275,372	7
Bekaa	539,448	14
Total Lebanon	4,005,025	100

The darkly highlighted rows represent the directly war-affected areas (governorates or districts).

** Lebanon is divided into six regional administrative districts, in Arabic Mouhafazat (singular: Mouhafazah). The six Mouhafazat of Lebanon are: Beirut, Mount Lebanon, North, South, Nabatiyeh and Bekaa.*

The socio-demographic context is marked by important and interconnected phenomena: (a) clear and rapid urbanization – the sharpest decrease in rural population in the Mediterranean and Middle East countries. The massive rural exodus has been from disadvantaged regions in the Bekaa and the south, and is related to poverty and war, leading to the growth of urban slums in the southern suburb of Beirut; (b) mass emigration to foreign countries all over the world, from both urban and rural areas, motivated mainly by the security conditions during the civil war (1975-1991) and the ensuing unemployment and socio-economic conditions. Since 1975, up to 1.3 million people have left the country, mainly professionals and skilled workers looking for better opportunities and leaving behind a population relying heavily on remittances; (c) a large number of immigrant workers, mainly Syrian labourers and female Asian and East-Asian domestic workers who live in precarious conditions, estimated at more than one million people; and (d) the presence of 405 000 unofficially registered Palestinian refugees who live in 12 refugee camps throughout the country.

Before the recent crisis, Lebanon was still struggling to recover from about two decades of devastating civil war (1975-1990) and Israeli occupation (1977-2000). As a result of the 15-year civil war, the country's infrastructure and the physical assets of all principal sectors were destroyed or severely damaged; the administration and public institutions were severely affected; the income level in 1991 was one-third of what it was in 1975; a quarter of the population was displaced; and one-fifth left the country.

Today, Lebanon is characterized by a service-oriented economy with a weak agriculture sector. During the 1990 decade, the predominant position of the services sector in the economy was accentuated.

¹ This report summarizes the findings and recommendations. Technical sub-sector reports are available in the project files. These include specific information on the sub-sectors and detailed calculations of figures provided in the main text as well as the assumptions used.

Between 1994 and 2004, the contribution of this sector increased from 61 to 72 percent of the GDP. Major sub-sectors are commerce, tourism and financial services. The industry and manufacturing sector accounts for 21 percent of the GDP. The great majority of the industrial enterprises are of small and medium size and, according to a 1998 industrial survey, the food industry is the most important component (23 percent of the industrial enterprises, and almost 26 percent of the total industrial output). In this context, agriculture plays a minor role in the economy. In 2004, it contributed less than 7 percent of the GDP (12 percent in 1994).

The Lebanese *labour force* is estimated at 1.36 million (34 percent of the population), with 20-30 year-olds being the most economically active and mainly employed in the services sector (41 percent) followed by trade (23 percent). Construction and industry employed 12 and 15 percent, respectively. Agriculture employed a small part of the labour force (9 percent). However, regional variations are important: in the Bekaa and in south Lebanon, agriculture remains the principal activity for an important segment of the population.

The Lebanese economy is highly dependent on *remittances* from Lebanese people working abroad. Since these remittances are frequently made through private channels, no reliable figure exists of their actual size. However, all sources estimate that expatriates send US\$5-8 billion to Lebanon each year. In 2004, the remittances were estimated by the World Bank at US\$5.7 billion. According to International Monetary Fund (IMF) estimates, from 1970 to 1998, the diaspora remittances represented, on average, the value of 35 percent of the GDP and close to 300 percent of exports of goods and non-factor services. Furthermore, the economic role of the diaspora is far from being limited to the remittances, as important as they are. For example, Lebanese expatriates constitute the backbone of Lebanon's tourism. Also, Lebanese bank deposits, which equal to 150-200 percent of Lebanon's GDP, are largely made by expatriate investment.

Lebanon is considered to have relatively *poor health and education indicators*, especially in the public sector. In addition, there are important regional disparities in access to services, for all of the Millennium Development Goals (MDGs). At the socio-economic level, the situation is increasingly marked by the increase of inequality and level of *poverty*, the erosion of the purchasing power, in particular of the middle class, and the increase of geographic disparities in poverty and level of development. Poverty is concentrated in urban suburbs, particularly in parts of Beirut suburbs, and predominantly in the rural areas of south Lebanon (as well as in the Bekaa and Hermel). These areas appear to constitute major pockets of human and income poverty. The most deprived are Bint-Jbeil (67 percent in poverty), followed by the Cazas² of Hermel (66 percent), Marjayoun (60 percent), Baalbeck in Bekaa (49 percent) and Tyre in South (45 percent).

A.2 Crop production

From a national perspective, Lebanese agriculture plays a limited role in the economy of the country, contributing, overall, up to 12 percent to the GDP, and representing 20 percent of total export earnings. According to a MoA survey conducted in 2004, the value of crop production is approximately US\$1 030 million, representing 73 percent of the total agricultural production in Lebanon. Agricultural output meets an estimated 30 percent of domestic food demand. Annual expenditure on food and agricultural imports totals US\$1.5 billion, compared to only US\$230 million earned from agricultural exports, mainly to Gulf countries. The sector employs just over 9 percent of the labour force, with large variations depending on the governorate. However, agriculture constitutes the main source of income for an average 30-40 percent of the population in Lebanon. In particular, for many of the war-affected villages in the south of Lebanon as well as in Baalbeck and Hermel, which also represent the poorest sections of the country, agriculture is reported to assume up to 80 percent of the local GDP and represents the major income-earning and employment opportunity.

The total agricultural land is approximately 270 000 ha, of which nearly 50 percent is under irrigation. The available agricultural land resources are thus very limited, considering that Lebanon has a population of more than 4.6 million. With 39 percent of the nation's agricultural area, the Bekaa Valley

² The six *Mouhafazat* of Lebanon are further subdivided into counties, in Arabic *Caza*.

has the largest acreage of agricultural land in Lebanon. North³ is second to Bekaa, with 26 percent of the agricultural land, followed by South, Nabatiyeh and Mount Lebanon, with 12, 11 and 10 percent, respectively. Agriculture in Lebanon has evolved from traditional less profitable cereals to high-value fruit and vegetable production. During the last decade (up to 2005), agriculture has achieved a real annual growth rate of 2.2 percent. This was driven by a healthy rate of export growth (8 percent per annum between 1996 and 2004) and an expansion of the area under irrigation (from 67 000 to 135 000 ha between 1986 and 2004). The total number of farmers exceeds 200 000, most of whom (approximately 73 percent) have less than 1 ha but still use 19 percent of the cultivated land. In marginal areas like in the south of Lebanon, Akkar in North and Baalbeck in Bekaa, the population relies mainly on agricultural activity. Although the majority of farmers in Lebanon are men, women farmers constitute an average 9 percent of the total farmers. Women are involved mainly in the production of dairy products, food preserves and subsistence farming.

Three types of production account for over 90 percent of the cultivated agricultural area. Fruit trees occupy, by far, the largest area, representing 31 percent of the total agricultural land used. These are followed subsequently by cereals (22 percent), olive trees (22 percent) and vegetables (16 percent). The remaining 9 percent of agricultural land is occupied by industrial crops, mainly tobacco (5 percent) and other small crops (4 percent). As stated above, about 49 percent of the agricultural land in Lebanon is under irrigation, and this concerns all crops at variable rates. Except for the governorate of Nabatiyeh, where the percentage of irrigated land does not exceed 5 percent, irrigated land in the other governorates exceeds 40 percent (66 percent in Bekaa, 46 percent in South and Mount Lebanon and 45 percent in North). Irrigation consumes approximately 64 percent of the total water supply and is used mainly to grow high-value crops for the local and export markets. Irrigated vegetables and fruit trees represent 87 and 66 percent of their categories, respectively. The percentage of irrigated land varies between 34 and 55 percent for such enterprises as cereals and leguminous and industrial crops. The lowest percentage of irrigated land belongs to olive trees. Different irrigation systems are used for various crops, ranging from furrow, sprinkler and pivot to drip irrigation. However, water-use efficiency remains very low.

A.3 Livestock

The country has a heavy deficit in its major staple food products, such as wheat, beef and milk. Lebanon imports almost 80 and 60 percent, respectively, to meet the national consumption of beef and dairy products; the imported value of these animal products reached almost US\$500 million in 2005. Livestock is a mainstay of the rural economy and has a significant impact on rural well-being and poverty alleviation, particularly in marginal areas such as in the south of Lebanon, which houses the highest poverty indicators in the country. The small stockbreeders in the main affected areas represent at least half of the farmers; the livestock sub-sector is their major economic activity, generating significant household cash income through sales of live animals or livestock products. Almost two-thirds of farmers in southern Litani River who are of low socio-economic status are living mostly from goat rearing and processing popular milk products like *laban* (yoghurt) and *labneh* for sale. Many people, mainly the youth and women, are usually involved in milking, animal care, milk processing or industrial poultry enterprises.

According to recent government statistics, there are 80 000 cattle, 350 000 sheep, 450 000 goats and a few million of poultry in Lebanon. Since the last decade, the livestock industry improved significantly, mainly due to large investments made by farmers to improve their production potentials and try to meet the local market requirements. About 40 percent of the dairy herd is of a pure imported breed, whereas goats mostly belong to the local “*Baladi*” breed and sheep to the “*Awassi*” breed. Dairy cattle (Holstein – Friesian) in Lebanon is estimated at 37 000 cows, with 25 000, 8 000 and 4 000 dairy cows in the Bekaa, South and North, respectively. The number of dairy cows increased with the programme of “rehabilitation of animal production” in the Bekaa (funded by IFAD) and a cooperative project between the Government of Lebanon and the United States of America, with importation and distribution of dairy pregnant heifers to farmers on a loan basis.

³ Both North and South are *Mouhafazat* (or governorates) of Lebanon.

The rearing of goats is basically confined to the most deprived areas in the south of Lebanon (Cazas of Marjayoun, Hasbayeh, Bint Jbeil, Nabatiyeh and Tyre). There, it plays a key economic role for the numerous households that do not have other alternative sources of income. With the return of the displaced farmers after the occupation of south Lebanon (year 2000), they took the opportunity to increase the number of their herd and process milk products to cope with the present situation of population growth in the southern region.

A.4 Fisheries

The reported marine production for 2004 was 7 800 tonne per year, to which must be added an aquaculture production of 800–1 000 tonne per year. An estimated 16 200 tonne of fish is imported. About 50 percent of imports were frozen and a quarter fresh in the round, mainly from neighbouring countries. The figure for marine production does not take into account the very significant catches taken by “amateurs”, either of small fish with rod and line from the coast or of larger pelagics taken offshore by boat. A high proportion of fish is eaten fresh (or frozen) and there is no tradition of fish processing. The seasonal variation in production is quite large, with 30 percent caught in spring, 42 percent in summer, 22 percent in autumn and only 8 percent in winter. Of the freshwater aquaculture of trout in the Bekaa Valley (Hermel) of 800–1 000 tonne per year, some is exported to Syria but most of the rest is consumed in specialized restaurants close to the trout ponds. There are also reported to be 18 inland fishing vessels working on lakes and in the Litani River, but their production is not recorded.

The fisheries of Lebanon are small-scale, and are traditionally based on bottom-set stationary gear (trammel nets and longlines), purse seine nets (lampara) and beach seines. They are almost exclusively conducted within six nautical miles of the coast; in recent years mostly for security. Fishing operations, with the exception of longlines, are mostly carried out at depths of up to 50 m. A considerable proportion of the nets (purse seines, gillnets and beach seines) have mesh sizes of less than 2 x 2 cm, which is the government-mandated minimum. The previously extensive fishing with explosives has been significantly reduced during the past few years because of stricter control by the military. The current census indicates a total of 2 662 operational fishing vessels working out of 44 fishing ports along the coast. The 18 vessels working on inland waters are in addition. The marine fishing vessels are almost exclusively of the traditional Mediterranean felucca type under 12 m length, with a third of the fleet being less than 6 m. There are three larger vessels, one purse seiner and two trawlers. The bulk of the traditional fleet is constructed of wood (78 percent), while 92 percent are motorized mostly with inboard diesel engines of less than 30 hp. Only a few vessels have a global positioning system (GPS) while the rest have very limited navigational or safety equipment, although 20 percent have electronic fish finders. In almost all cases the gear is operated by hand. All boats are individually owned; about 80 percent by one individual. The same proportion of owners operate their own boats. The average manpower engaged in fishing, including owners, is of the order of 6 500, who are predominantly Lebanese. The fishing community is organized into 29 cooperatives and five syndicates, but cooperative membership covers only some 43 percent of those involved. The cooperatives are based in one port, but with more than one cooperative in some of the larger centres. Fish preservation equipment is very basic with some of the vessels having insulated fish holds and using ice for longer trips. Otherwise, the fish lands unchilled, but may either be chilled in the cooperative for retail sale or for transport to Beirut. Transport is normally by insulated vehicles.

A.5 Forestry

Forests in Lebanon constitute an important natural resource. The main forest species in Lebanon consists of pine and oak stands. The forests cover 139 376 ha, while the other wooded land extends over 108 378 ha. The total area covered by the forests and other wooded land represents about 23 percent of the surface area of the country. Other lands with trees (including fruit and olive trees) extend over a surface of 113 000 ha or 11 percent of the country. Coniferous forests cover an area of 43 936 ha, which represents 32 percent of the forest area, broadleaf forests 77 230 ha (57 percent) and mixed forests 15 282 ha (11 percent).

Timber in Lebanon does not constitute a major forest product, despite the fact that some of the Lebanese species, like the cedars, the junipers and some oaks could produce a wood of good quality. Wood production is restricted to fuel wood and charcoal in some areas. The average standing volume of wood was estimated at 35.6 m³/ha in 2005 (MoA, FAO). However, the present structure, cover and distribution of the forests do not allow for a valuable timber production. Nevertheless, fuel wood is the most important forest product and is collected in 60 percent of the forest area. The poorest rural communities depend on fuel wood and charcoal as sources of energy for cooking and heating, while most of the population depends on petroleum products, electricity and a minor part of the inhabitants uses solar energy. Non-wood forest products are the main income-generating activity related to the forest resources. These products are mainly pine nuts, carob pods, aromatic and medicinal plants and fodder for livestock. The production of pine nuts from *Pinus pinea* forests is an important income source. The estimated production of edible pine nuts is approximately 600 tonne annually, which provides an income of about US\$13 million. *Ceratonia siliqua* (carob) is also highly appreciated for the production of carob molasses, which are used locally and exported as a dessert.

The current expansion of ecotourism, agri-tourism and rural tourism is leading to a sharp increase of the role of forests in poverty alleviation. Ecotourism is an expanding activity in the forests of Lebanon, attracting local and foreign tourists, mainly tourists from the Gulf countries. Lebanon is a rich country in biodiversity and has some 2 600 plant species, of which 12 percent are endemic. An estimated 212 plant species in Lebanon are of economic value and are considered as medicinal plant species or edible crops. Large carnivores living in Mount Lebanon include golden jackal, wolf, jungle cat and red fox. The forests also provide important habitat for a large variety of birds, including migratory birds.

B. Overall Impact of the Hostilities

The military bombardments lasted almost five weeks and were directed mainly at southern Lebanon and the southern suburbs of the capital Beirut. These are precisely the areas with the highest poverty indicators in the country (see Maps B and C). South Lebanon is highly dependent on agriculture, as it represents the main source of income in this part of the country; half the working population in the south earn their living entirely from agriculture and constitute overall almost 70 percent of the total household income.

The violence led to the displacement of an estimated 974 184 people (almost a quarter of the Lebanese population), resulting in a death toll of 1 187, most of whom are reported to be civilian. A further 4 398 were injured, one-third of these believed to be children; 500 of the injured are permanently disabled. Structural damage includes 15 000 homes destroyed and a further 15 000 uninhabitable; 900 factories and commercial buildings, 107 bridges, 680 km of road and 27 fuel stations destroyed; as well as damage to airports, ports, water and sewage treatment plants, dams and electrical plants. The environmental damage due to the warfare is yet to be quantified, but includes an oil spill, affecting half of the Lebanese coast, and the unknown effects of bomb-induced soil contamination on crop production and human health. The timing of the conflict decimated Lebanon's summer tourist season, which usually brings in US\$2.5 billion to the country given that tourism is one of its most important sectors.

The five-week period of hostilities and the initially imposed sea and air blockade caused disruption to the food supply chain, through damage to infrastructure and stoppage of imports, thereby adversely affecting food availability. Lebanon's import/export ratio is normally 10:1, and over half of the country's imports come through the Beirut port, one-third through the ports of Sidon, Tyre and Tripoli, about 17 percent by air and about 10 percent by road from Syria. However, the resilience of the market to this temporary disruption has not been undermined as there was little fragmentation and as the lifting of the blockade allowed the market to recover its usual dynamism.

B.1 Socio-economic impact on livelihoods

Widespread physical destruction, economic loss and disruption in labour markets will have a significant impact on the long-term recovery of the country. While too early to fully assess the impact of the war on basic living conditions and other development indicators, the massive damage done to the economic

base (sources of income, including agriculture), the housing sector (in particular poverty pockets) as well as the total or partial demolition of many schools will most certainly have a regressive impact on the gains made in both of these indicators over the past decade. Prior to the war, Lebanon witnessed direct improvement in social indicators across its different regions. Deprivation rates had dropped down from 31 percent of households in 1994/95 to 25 in 2004/05 (see table below). This improvement occurred particularly in the fields of education (+9), housing (+9) and access to water and sanitation (+2).

Mouhafazah	Percentage of deprived households		Change (%)
	1995	2004	
Beirut	15.9	9.3	- 6.6
Mount Lebanon	23.6	16.2	-7.4
North	42.8	31.2	- 11.6
Bekaa	39.9	37.7	- 2.2
South	36.4	37.3	+ 0.9
Nabatiyeh	50.3	46.4	- 4.0
Lebanon	30.9	24.6	- 6.3

Loss of income opportunities, housing and shelter means insecure and perhaps deteriorating living conditions for around 50 000 families – implying a considerable strain on family resources. This situation is compounded by substantial damage to the infrastructure which poses considerable public health risks as well as limited access to water and sanitation networks. In education, the combined impact of damage to schools, continued displacements and deteriorating economic conditions may exacerbate school dropout rates and increase the incidence of child labour. Moreover, the conflict may also negatively impact the rate of progression of children through schools.

Despite overall improvements in basic living conditions between 1998 and 2004, income-related indicators, mainly in employment and economic dependency, worsened during the same period from 43 to 52 percent for the entire population. Prior to the conflict, around 7 percent of the population lived in absolute poverty and another 28 percent in relative poverty. In the aftermath of the conflict, income-related indicators are expected to worsen and economic dependency ratio is expected to grow. Loss of life, loss of crops and livelihoods, destruction or damage of housing, displacement and support to other family members have aggravated the living conditions of the most vulnerable populations and increased their threshold of deprivation.

The deterioration in income-related indicators and increase in economic dependency has been compounded by direct and indirect damages sustained by the different economic sectors as well as the disruptions in the labour market. In particular, widespread destruction of micro-, small and medium enterprises as well as the direct and indirect damage sustained by the agricultural and industrial sectors has resulted in dramatic loss of income as well as increased unemployment. For example, around 30 percent of micro-enterprises have been affected either as a result of direct damage in properties or productive assets or have become un-operational due to loss of operating capital and assets. This loss of income and/or income-generating assets threatens both the immediate livelihoods of the most vulnerable sectors of the population and the sustainability of micro-credit institutions. In tandem, preliminary estimates indicate that nationwide unemployment is estimated to rise from around 9 to 11 percent prior to the war to around 20 percent as a result of direct and indirect losses sustained by various sectors. Furthermore, people working in the informal sector and those engaged in seasonal and temporary jobs (tourism, agriculture and services), estimated at around 11 percent of the total workers, were out of jobs for at least two months. Many are probably still unemployed.

Preliminary assessments indicate that the war has increased the numbers of the most vulnerable populations at risk of falling into the poverty trap. These include women heads of households, children, elderly living alone and the disabled, as well as unskilled labour, farmers and those employed in the informal sector. For example, of the 4 000 individuals injured during the war, around 15 percent will be disabled for life. Similarly, the 14 000 women heads of households who live in poverty will most probably increase in numbers in the post-conflict period as will their levels of deprivation. Limited

resources, no social/employment protection and weak state forms of social protection mechanisms render their lives and those of their dependants at stake. Traditionally, family remittances and other such communal support compensated for the absence of formal safety net programmes. With more families facing socio-economic hardships, these forms of support may also dwindle. More critically, falling into the poverty cycle also means a potential increase in child labour as more families may pull children out of school so as to augment family income.

B.2 Agriculture – crops and livestock

Physical destruction and lost production

The conflict affected the sector directly in terms of physical damage, but, more importantly, indirectly in terms of lost markets and labour opportunities. The *mass displacement* during the hostilities put a halt to most economic activities, and the coping mechanisms available to different socio-economic livelihood groups have since revolved around reliance on savings and social networks. The impact on farming took the form of interruption in crop care and livestock husbandry, the dislocation of markets and direct physical damage to land and other agricultural assets. Direct losses, such as the physical damage to crops and equipment through direct bombing, and the destruction of greenhouses, account however for a minor share of the agriculture loss (around 16 percent).

The major damage was caused through the impossible access to the fields during the 33 days of bombing as farmers fled their villages and left their *crops and animals unattended*. The interruption in the care of crops and animals was responsible for a large portion of the income/production losses. Most of the agricultural workforce, including foreign labourers, fled South Lebanon and Nabatiyeh. Those who remained were unable to work as mobility was restricted. The mostly cited losses were in tobacco and seasonal produce. Tobacco, which does not need regular watering, was harvested once or, at best, twice (out of four times in a season) with reported losses in some areas of up to 90 percent. Seasonal fruits and vegetables (melons, watermelons, cucumbers, tomatoes, etc.) that need regular water have, in many locations, sustained losses of similar degree. The war took place at the peak time for the harvest (mainly stone fruits and potatoes) destined for export, but much of this year's *harvest perished* on the ground, as bombing forced farmers to abandon their land and transport to market became impossible. It was reported that trucks attempting to transport agricultural products to market were hit several times by air raids. According to agricultural wholesalers, MoA and the Investment Development Authority of Lebanon (IDAL), restrictions on movement reduced the flow of fruit and vegetables to Lebanese consumers by three-quarters and *reduced expected annual exports* by some 15-20 percent (around US\$20-25 million). Because Lebanese exports are generally based on personal relations between exporters in Lebanon and importers in the Gulf States, rather than on long-term contracts with supermarkets, there is optimism that exports can recover when production is restored.

With the loss of income from harvests, many farmers have become *heavily indebted* as they usually repay their debts during the harvest period (May-October) to secure credit for the following planting season. This year, their ability to repay these debts has been reduced to the minimum, making it impossible to start the new cropping cycle due to the *lack of working capital*. There is much concern that this will lead to a *downward spiral of debt and poverty* for the Lebanese farmers.

The *livestock* sector in Lebanon, mainly in the south, has been continuously affected by several conflicts for the last three decades, and more specifically due to the 2006 hostilities. The conflict has weakened the productive capacity of animals through death of stock and decrease in production – due to the forced rural exodus and related abandonment of animals and lack of feed and healthcare during and after the hostilities. This will have a serious negative impact on the country supply of animal products and it therefore will increase tremendously the imports of beef and dairy products, worsening the balance of payment of the country which is already heavily indebted. The outbreak of the war and its aftermath has slowed down livestock rearing and processing activities resulting in the immobility of workers and loss of employment opportunities. The sale of livestock and its products in the affected areas of south Lebanon is one of the major income sources of resource-poor rural households, providing cash to families to buy food. Therefore, a loss of livestock or a decrease in their market value has a devastating impact on these families' food security. Furthermore, the traditional dairy products, particularly the *laban* and *labneh* from goats and cows are the most popular protein sources in Lebanese

culinary habits, and accompany daily food, providing high-quality dietary protein for people, mainly children and women. The prices of animal products have almost doubled during and after the war, becoming non-affordable to the most resource-poor families.

Unexploded cluster bombs

Many agricultural fields have been rendered useless until unexploded bombs littering the land can be removed or exploded. Clearing the land of these unexploded bombs will be essential to enable the reconstruction of agriculture-based livelihoods. De-mining the agricultural fields and roads that are scattered with cluster bombs which represent a great danger for the population is a paramount need. The amount of unexploded bombs will hamper the future social and economic livelihood of the region. Cluster bombs were part of an enormous quantity of bombs fired by Israel into southern Lebanon. During the first weeks of the Israeli aerial and ground assault, Israeli forces delivered up to 3 000 bombs, rockets and artillery rounds daily, climbing to 6 000 per day towards the end of the war. Hundreds of thousands of pieces of unexploded ordnance (UXO), mostly cluster bombs (anti-personnel weapons that spray bomblets indiscriminately over a wide area), will need to be cleared before agriculture can be re-established. It was reported that more than 1.2 million cluster bombs were dropped by the Israeli forces; about 90 percent of these were dropped in the last 72 hours of the war when the Israeli forces were already aware that a ceasefire was imminent. Israeli reports indicate that cluster-bomb contamination may be significantly greater than first estimated. Israeli rocket units fired a total of 1 800 rockets containing cluster bombs in the last days of the conflict. Each rocket fired contained 644 cluster component bombs, adding up to a total of 1 159 200 individual bombs that were dispersed over southern Lebanon. As of 19 October 2006, the UNMACC had identified 778 individual cluster bomb strike locations. UNMACC estimates that the failure rate of these cluster bomb sub-munitions is between 30 and 40 percent. Many hundreds of thousands of unexploded cluster sub-munitions are scattered throughout the southern region. Complete clearing of the south (including the landmines from previous wars) could take up to 10 years. It is also estimated that from 14 August to 19 October 2006, 150 civilians were injured and 21 killed as a result of mines and cluster bombs – including one dead child and 23 injured children. Most of the victims were men since they were typically the first ones to return home after the ceasefire and generally tend to be more involved in agriculture than women and children. Most unexploded bombs are small and innocuous-looking, some in the shape of a soft drink can, often with ribbons attached, thus making them particularly attractive to curious children. Nearly 1 000 staff is currently involved in clearance operations. According to NDO, it is hoped that 95 percent of the ‘contaminated areas’ in the south will be cleared of UXOs by 2008.

Mine clearance personnel are understandably giving priority to urban centres and roads, rather than agricultural fields. Therefore, many farmers are attempting to explode the bombs on their own, which is extremely dangerous. In many instances, farmers have been burning off their fields after demarking the bombs, in an attempt to destroy them but in doing so put their lives at stake. Other farmers are paying approximately US\$6.50 per bomblet for “artisanal” bomb disposal in order to resume farming. This is not desirable, but reflects lack of confidence that the Lebanese army will clear fields rapidly. It is estimated that overall at least *26 percent of the cultivated land in south Lebanon has been contaminated* – 16 percent of land used to cultivate citrus fruits and bananas and 10 percent of land used for planting field crops. Also, olive trees will suffer the economic impact for two years as the farmers are not able to prune their trees – 3 percent of the area has been affected. In addition, about 7 percent of the land used for the grazing of animals has been contaminated. Translated into hectares, NDO estimates that there are approximately 9 450 ha of agricultural land contaminated with UXOs, of which 1 800 ha are citrus and banana, 7 400 ha field crops, 250 ha olive groves and some 3 500 ha grasslands. These figures might be underestimated, especially as they do not take into consideration open-field crops, such as tobacco and other field crops that are also contaminated with UXOs, and given the fact that dozens of cluster bombs are found every week. NDO, however, recognizes that these estimates are temporary and a good estimate would require time for proper analysis, i.e., overlying of agricultural maps/satellite imagery with strike location data.

Water resources have also been contaminated as the streambeds and banks are littered with UXOs, endangering the lives of shepherds and farmers. Clearing the fields has now become urgent, as in the upcoming rainy season, cluster bombs and other munitions will sink into the mud and/or become

camouflaged by the spring grasses, effectively becoming like landmines. The immediate aftermath of the conflict, first the blockade and then the presence of UXOs, has left an access problem for most livelihoods linked to food production systems. UNMACC estimates that it will take 12 to 15 months to give full clearance to all agricultural fields in the south of Lebanon. This period is too long and will lead to the loss of the 2006 harvest of such crops as olive and tobacco. This will also impact the coming spring season for most farmers in south Lebanon. While the loss of the 2006 harvest due to cluster bombs is estimated in this report, the indirect losses on the 2007 crop have yet to be verified.

Furthermore, the destruction of *irrigation infrastructure* will also continue to hinder the re-establishment of agriculture. The south of Lebanon is dry and arid, and the underground water level is very deep (about 600 m). Much of the agriculture in the region cannot be sustained by the rains alone. Without irrigation, much of the next harvest, even if it can be planted, will be lost. A great part of the irrigation networks and installations have been damaged. Much of the complex system of the Litani canal, which provides irrigation water to southern Lebanon, has been seriously affected. With many irrigation canals now full of unexploded bombs, it is estimated that it would take several years to clear the irrigation canals and repair the infrastructure. A shortage of fuel and electricity has also contributed to the water crisis, as water pumps require electricity or fuel-fed generators to run. Electrical facilities, power plants and fuel stations have suffered extensive damage, and at least 20 fuel depots have been completely destroyed.

Rural labour force and unemployment

According to the Ministry of Social and Affairs, currently more than 70 percent of the rural population in south Lebanon is unemployed. With the destruction of farms and of 124 medium-sized and large factories in the rural areas, many of them agricultural processing factories, people have been forced out of work. Many workers were already in a precarious situation even before the hostilities erupted: rural farm workers earn only US\$300 per month and there is normally work only eight months of the year; small farmers who own their own land earn about US\$500 per month – now unemployed, there is little to live on as Lebanon has no unemployment benefit or insurance for those forced out of work. Furthermore, one of the vulnerable groups of people particularly badly affected were *Palestinian refugees* living in unregistered camps, or ‘gatherings’, who do not benefit from any relief services and do not have the same rights as the Lebanese, in terms of inheritance, ownership or work. There are nine ‘gatherings’ in the area of Tyre and nine in the Bekaa area, and the majority of the Palestinian families survive on casual agricultural work and/or fishing, which have disappeared since the war, making it more difficult to feed their families. A serious concern that has been raised is that the poorest agricultural labourers, including Palestinians, will also be most at risk from UXOs as they will be too desperate not to accept work to clear the fields.

B.3 Fisheries

The fishing community suffered enormously from the effect of the war, both directly as a result of hostile action and indirectly from loss of income caused by the conflict and its after-effects. The fishing port of Ouzaii in south Beirut was attacked with missiles and boats and their gear was destroyed. The auction hall and all other buildings were also demolished. In the north of the country the fishermen’s cooperative in the port of Aabde was damaged during an attack on a military observation post immediately behind the port. In the north of the Bekaa Valley a trout farming area was bombed.

On 13 July, the Jiyeh power plant on the coast south of Beirut was attacked, but oil from ruptured tanks was contained. However, another attack on 15 July ruptured more tanks and breached the containment wall releasing over 15 000 tonne of oil into the sea. This led to a two-week fire while the plume, which ultimately stretched to 200 km, was being carried north by prevailing winds and currents. The coastline over this distance was exposed to oil contamination as remnants of burnt fuel and the heavier fractions either hit the coast or sank in a 500 m strip while the lighter fractions continued north. Some areas around Beirut and immediately to the north were particularly heavily impacted, blocking harbours and fouling vessels and gear as well as mooring lines. The oil also made the fishing vessels inoperable as the floating oil blocked cooling water intakes resulting in engine damage. These direct

effects caused economic losses due to the need for replacement of gear and lines and cleaning of boats. The associated indirect impact of the need to clean harbours and shorelines and the possible longer-term environmental damage will be felt for a long time.

The indirect impact of the war is much more serious than the immediate damage. It ranges from loss of income to present and future difficulties in marketing their products. The outbreak of war meant that fishing was not possible either during the conflict or during the economic air and sea blockade. Air transport links were restored on 8 September and the sea blockade was lifted on 9 September. From the outbreak of the war on 12 July until 9 September no fishing operations were possible and as a result no income was generated. The follow-on effect was loss of income for those involved in fish marketing, specialized fish restaurants and a range of people providing services to the fishing industry. In addition, the nature of fishing operations meant that a considerable quantity of fishing gear was set at the time when the war broke out. It was not possible to recover this gear and it was lost. Anecdotally, some of it was hauled and the catch consumed by Israeli naval patrols.

Just as it became possible to resume fishing, it became apparent that there was growing resistance to fish consumption from Lebanese consumers because of perceived food safety concerns following the oil spill. The fact that this period coincided with the Muslim holy month of Ramadan probably also affected demand. Reduction of market demand inevitably reduces prices and makes fishing unprofitable, extending the stress on the community. Although a number of public bodies took samples to attempt to verify the risks to fish consumers, monitoring of consumer safety has not been institutionalized, perhaps because of the lax administrative control of food safety noted above. However, the Ministry of Environment and MoA presented some analytical results at a press conference on 20 October, indicating that levels of heavy metal and organic pollutants from the oil spill were well within Lebanese and international limits. The programme of analyses was instituted by the National Scientific Research Council which, subject to the availability of funds, has embarked on a seven-month programme after the spill until the last sample to be taken in February 2007.

B.4 Forestry

The hostilities took place at the peak of the heat of the summer which led to starting fires in several forest areas and wooded land. Most damaged forests were caused by direct bombing, artillery fire, lighting bombs or clearing vegetation for military operations. Furthermore, as a consequence of the war, the developmental forestry programme in Lebanon was brought to a standstill, the forestry capacity weakened and the environmental and natural resource base badly damaged and is now under serious threat from millions of cluster bombs. The war has also affected nurseries and forest fire-fighting capacity. It is reported that nine fire-fighting vehicles were destroyed and 10 firemen killed. The impact related to the forest-resource destruction is reflected in the following: the loss of wood products, the loss of non-wood forest products, biodiversity loss and regeneration dynamics, the increase of soil erosion and decrease of water infiltration into the soil.

The number of forest and bush fires that started during the hostilities was thus much higher than during a normal summer. These fires were not being stopped or even noticed because the priorities had shifted from the environment to relief and humanitarian work. Worse still, the capacity to fight erupted fire was reduced as fire-fighting vehicles and helicopters could not move around for fear of being targets during the hostilities and later during the air and sea blockade. Consequently, forests, wooded land and shrubs burnt reduced the stands of pine, oak, grazing land and other forest resources.

C. Data Availability

MoA has carried out an extensive questionnaire survey to assess the damage of hostilities to the agricultural sector in Lebanon. The data entry was conducted by MoA staff in consultation with a hired consultancy firm specialized in data processing. The data analysis was supervised by the mission. During the mission's stay in the country, MoA provided data for the two governorates of southern Lebanon (South and Nabatiyeh); the data from other areas, such as Bekaa, may be ready in a few weeks' time, and will therefore not be available for consideration for this assessment. The survey was conducted at a period when farmers had just returned to their farms, realizing the extent of the damage

inflicted by the hostilities. Under trauma effect, farmers have rather the tendency to overestimate the losses. This is to say that there are some limitations to the methodology used and the quality of the data gathered. Nevertheless, the field surveys conducted by MoA have been a valuable source of information, also thanks to the substantial number of questionnaires collected (16 000 for south Lebanon).

The mission's damage assessment for the governorates of the South and Nabatiyeh is based, to a large extent, on the MoA survey, the mission's own field inspections and secondary evaluations made by other entities and farmers' cooperatives. The damage assessment for the other governorates of Lebanon was rather an estimate based on available statistics, third party assessments and the mission's field visits. Without any structured survey data available and because of the specificities of the agricultural sector which involves huge areas of a large number of enterprises with varying production cycles depending on the geographical area, a quantitative assessment of direct and indirect damage caused by the hostilities, *per se*, is limited.

Data available from the Fisheries and Natural Resources Department is limited, with the exception of the recent Census of Lebanese Fishing Vessels and Fishing Facilities. The full report of this has not yet been released but a synopsis is available. An earlier preliminary study of the fisheries sector in Lebanon contains scattered information but is not comprehensive. Most of the accessible reports repeat earlier unsupported information, and much of the available information is of questionable quality. The Lebanese Customs database gives an ostensibly accurate estimate of fish imports but, for instance, does not record the farmed trout exported to Syria.

Available and accurate information on forest damage is scarce and inadequate. The government did not conduct any survey to assess the damage caused by the war in the forestry sector. A quantified assessment needs a field survey and satellite imagery that was not possible to acquire during the visit of the mission. Data was collected through field inspections, interviews with the local foresters, forest guards who identified the forest sites affected by the hostilities and local NGOs. Therefore, it is recommended to conduct an in-depth survey using satellite imagery to evaluate the exact extent of areas affected and the volume of wood and non-wood forest products and other resources that were damaged by the war.

D. Physical Damage and Production Loss

D.1 Crop production

Physical damage

The heaviest direct damage and most losses occurred in the governorates of the South and Nabatiyeh in southern Lebanon. In fact, the agricultural area in these two governorates accounts for nearly a quarter of Lebanon's agricultural land and the farm holders represent approximately one-third of the farmers in Lebanon. These governorates and especially Nabatiyeh are characterized by small-scale subsistence farming. A major crop produced in these southern governorates is olive, which represents over 40 percent of the total olive area of Lebanon. The other important crops and income producers in the south are citrus orchards, with over 70 percent of the total national production area, and industrial crops, including tobacco, with over 56 percent of the total area in Lebanon.

Based on a MoA survey (see table below), the total agricultural surface area physically damaged by the hostilities in the two governorates of southern Lebanon amounts to 2 965 ha, of which 1 810 ha are tree crops (62 percent) and 1 135 ha field crops (38 percent). In the governorate of Nabatiyeh, a total of 1 269 ha of crops have been physically damaged, of which 38 percent are trees crops and 62 percent field crops. In the governorate of South, a total of 1 679 ha of crops have been physically damaged, of which 89 percent are tree crops and 31 percent field crops.

Overall impact of hostilities on crop production in South Lebanon (Mouhafazat of South and Nabatiyeh)

Category	Cultivated Area	Normal Production	Physical Damage		Production Loss			Total Financial Loss
	(ha) 1)	(tonne) 1)	(ha)	(US\$1000)	(tonne)	% loss 2)	(US\$1000)	(US\$1000) 3)
<i>Olives</i>	23,431	70,214	621	1,936	13,684	19	11,576	13,512
<i>Citrus</i>	11,300	311,955	634	5,763	75,644	24	25,215	30,978
<i>Banana</i>	2,470	81,135	236	3,043	28,117	35	14,021	17,064
<i>Other tree crops</i>	4,203	61,744	320	1,391	12,523	20	8,836	10,227
Total Tree Crops	41,404	525,049	1,810	12,133	129,968	25	59,648	71,781
<i>Tobacco</i>	5,936	6,743	139	<i>n.a.</i>	1,220	18	7,914	7,914
<i>Vegetable crops</i>	2,161	129,891	338	<i>n.a.</i>	47,857	37	12,545	12,545
<i>Other field crops</i>	12,677	46,089	658	<i>n.a.</i>	8,349	18	2,218	2,218
Total Field Crops	20,774	182,723	1,135	<i>n.a.</i>	57,427	31	22,677	22,677
<i>Cut Flowers 4)</i>	<i>n.av.</i>	<i>n.av.</i>	<i>n.a.</i>	<i>n.a.</i>	20,792,498	<i>n.av.</i>	41,585	41,585
<i>Mixed seedlings 5)</i>	<i>n.av.</i>	<i>n.av.</i>	<i>n.a.</i>	<i>n.a.</i>	576,244	<i>n.av.</i>	2,051	2,051
Total Nurseries	<i>n.av.</i>	<i>n.av.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.av.</i>	43,636	43,636
Greenhouses	1,132	127,827	20	241	3,368	3	902	1,143
Equipment/Mach.	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	12,342	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	12,342
Grand Total	63,310	835,599	2,965	24,715	190,762	23	126,863	151,578

1) *Agricultural Production Survey, MoA-FAO (2004)*

2) *with respect to normal production.*

3) *physical damage and production loss.*

4) *Production Loss in pocket for cut flowers*

5) *Production Loss in number of pots for ornamental plants, fruit seedlings & mixed seedlings*

n.a. = not applicable

n.av. = not available

In other parts of Lebanon and with the exception of Bekaa and Hermel there was no physical damage to the crops. In Bekaa, a cold storage facility for seed and consumption potatoes as well as fruits in north Bekaa was completely destroyed on 24 July 2006, resulting in a total loss of an estimated US\$2 million. This cold storage facility belonged to a cooperative which benefited 50 farmers. The immediate and short-term impact of such destruction will carry over to the next cropping season, especially for seed potatoes. Furthermore, a packing station and cold storage facility of fruits in Qaa was completely destroyed, claiming 45 human lives and resulting in an estimated loss of US\$2.5 million, inclusive of all the equipment and produce.

Public irrigation infrastructure. Repairs to public irrigation infrastructure, particularly the Qasmieh/Ras El Ain and south Bekaa schemes, were costed at US\$2.5-3 million (by Litani River Authority or LRA). In addition to other damage, the primary Ras Al Ain canal was hit at 28 points. Emergency repairs have been completed and nearly all primary and secondary irrigation systems are running. With temporary repairs in place, the NGO CHF International will begin permanent repairs at the end of the irrigation season (end of October). These repairs will take four months.

Qaraoun Dam. Replacement and repair of the generators of Qaraoun Dam (multi-purpose dam under LRA), south Bekaa pumping stations and associated facilities is a priority and needs emergency funding, given their critical role in water and electricity supply to downstream irrigation areas and towns/villages. LRA estimates the costs associated with the above work at about US\$7 million.

Production loss

Excluding the high value niche market crops of cut flowers (which are usually not part of the cropping pattern of the majority of small-scale and resource-poor farmers in south Lebanon), the survey data of MoA reveal that in the two governorates of southern Lebanon (South and Nabatiyeh), the overall quantity of production loss – tree and field crops not being harvested or marketed – amounts to 187 395 tonne, of which 129 968 tonne are from tree crops (69 percent) and 57 427 tonne from field crops (31 percent). The highest harvest loss occurred in the governorate of South, representing 79 percent of the harvest loss in overall southern Lebanon; in this governorate, a total of 147 277 tonne of crops have been lost, of which 114 952 tonne (78 percent) are from tree crops and 32 325 tonne (22 percent) from field crops. The harvest loss in Nabatiyeh amounts to 40 117 tonne, representing 21 percent of the total harvest loss in the two governorates of the south, with harvest losses of 25 102 tonne (63 percent) from field crops and 15 015 tonne (37 percent) from tree crops.

The total financial losses (tree crops and field crops, see table above) due to physical damage and loss of harvest of crops in the two governorates of southern Lebanon amount to approximately US\$94.458 million, of which about 76 percent was incurred to tree crops and the rest to field crops. The financial losses for field and tree crops in the agricultural sector were much higher in the governorate of South (about US\$74.363 million) than in Nabatiyeh (about US\$19.833 million). This is in relation to the type of crops which are predominantly grown in these two governorates – high-value crops such as citrus in South, and low-income field crops in Nabatiyeh. Within the governorate of Nabatiyeh, financial losses varied considerably among the four Cazas. The Caza which incurred the highest financial loss was Bint Jbeil followed by Marjayoun. Within the governorate of South, the Caza of Tyre sustained the highest financial loss, followed by the Caza of Saida and Jezzine.

Based on the MoA questionnaire survey, the entire sub-sector loss – physical damage and production/income loss – including tree and field crops and damage to nurseries, greenhouses and farm equipment/machinery is estimated at US\$152 million for south Lebanon.

With respect to lost production/income, other governorates of Lebanon (Mount Lebanon, North and Bekaa) also sustained losses due to non-harvested or unmarketable yields. As the MoA survey data for these governorates were not readily available at the time of writing this report, only rough estimates of the financial losses based on the statistics of MoA and the mission's field observations can be made. Under these circumstances, for the remaining areas of Lebanon, the total financial production loss is estimated at roughly US\$80.784 million (US\$32.12 million for tree crops and US\$48.66 million for field crops).

This leads to a total estimated financial damage to the sub-sector of crop production of around US\$232 million, of which just about 16 percent corresponds to direct physical damage. However, as stated earlier, as these figures are based on partial results of a restricted survey and limited number of reliable secondary sources of information, the estimated figures will have to be treated as preliminary and best estimates.

D.2 Livestock***Dairy cattle***

The nature of the damage ranges from the loss of animals, buildings, feed resources, equipment and machinery to lost revenue income. The impact of the hostilities had hit most of livestock farmers in the whole of Lebanon, but at various damage degrees. The most direct physical damage and losses are witnessed in southern Litani River; in border villages hit by the heaviest battles throughout the whole period of the conflict. The main causes of physical damage and losses are, by degree of importance: (i) death of starvation and thirst after rural exodus; (ii) death by shelling and bombs; and (iii) death due to shortage of feed, water and lack of healthcare. The table below demonstrates the geographical focus of the hostilities on south Lebanon, with 1 500 of the total 3 050 dead animals. The direct financial loss is calculated according to an estimated composition of the animals that died (calves, young stock, cows and pregnant heifers) and is around US\$3.76 million.

War-affected areas	Number of dairy herd prior to the conflict	Percentage of direct physical loss	Number of dead animals
North of Lebanon	4,000	2.5	100
Western and central Bekaa Valley	20,000	2	400
Eastern Bekaa Valley	5,000	6	300
Northern Litani River	5,000	15	750
Southern Litani River	30,00	50	1,500
Total	37,000		3,050

Beyond the direct physical losses there is an important impact on employment and revenue-generation capacity, as the indirect shocks on dairy herds will resonate for months to come and thereby also on the farmers' financial situation. The war stress on animals, the shortage of feeding and watering and the rupture of veterinary interventions resulted in the following: (a) *loss of milk* – at least one-third of dairy farmers discarded their milk during the whole duration of the war and even 1 to 2 weeks after the war before milk centre collection and cheese factories restarted working; (b) *low milk production* – poor nutrition and management resulted in large drop of milk yield estimated at 50 percent during the war. Moreover, the return of milk production to its normal cycle trend will take some time. Two months after the conflict, milk yield is still below 30 percent compared to the period just before the conflict. Furthermore, it is estimated that 30 percent of milking cows dried off; (c) *loss of body weight* – this will dramatically result in long-term negative effects: delayed conception after mating, decrease in milk production and short lactation; (d) *deterioration of animal health status* – during the war, milking cows were not milked or milked only once a day or every two days, thus a number of milking cows, estimated at 20 percent, got severe mastitis, which is not easy to cure. Furthermore, animals weakened by poor feeding and management were predisposed to diseases; (e) *low reproduction* – poor nutrition rules out mating for up to four to six months after calving and significantly affects cow fertility. In addition, some cows aborted and also missed artificial insemination services during the conflict. Overall, besides the physical losses, there was a financial loss of income due to the hostilities calculated at US\$107/cow/year which occurred with 13 580 cows (total dairy herd estimated at 37 000 head, with 3 050 that died, and assuming that milking cows during the war period represent 40 percent of the dairy herd). Therefore, the income loss for the dairy cattle sub-sector is estimated at US\$2.039 million, bringing the total loss of the sector to US\$5.798 million.

Beef cattle

An estimated number of 60 smallholders, around Bint Jbeil, Khiam, Tyre, Nabatiyeh and Beirut suburbs had lost some 500 beef cattle. In addition, one large fattening commercial farm well established in southern Beirut's agglomeration was totally destroyed by missile attacks, including 750 fattened bulls and 3 000 fattened sheep ready for the slaughterhouse. The estimated financial loss from direct physical damage to fattening animals is US\$2.860 million.

Beekeeping

The total number of beehives in the country is around 130 000, concentrated in the south in orchards and in mountainous shrub lands. The total number of beehives completely destroyed by the war is estimated at 18 000, of which 14 450 hives are in the south (Hasbayeh: 1 000, Nabatiyeh: 2 500, Bint Jbeil: 4 000, Marjayoun: 2 000, Jezzine: 450, Saida: 1 500 and Tyre: 3 000). The beehives were destroyed either by bombs, bomb poisoning, fire in the mountainous and orchard areas or by starvation and thirst when farmers left the conflict areas. Moreover, it is estimated that 10 000 beehives were indirectly damaged through interruption of feeding and watering during the dry season at war time, thus the production of those weakened beehives is expected to be 20 percent lower compared to the normal season. The total physical and income loss is estimated at US\$4.188 million.

Goats and sheep

Among small ruminant breeders, goat stockbreeders were heavily affected by the conflict. The most direct physical damage and losses are witnessed in southern Litani River, in border villages. Goats are one of the main users of natural resources, mainly in the south where there is a wide range of sylvo-pastoral pastures for grazing. The physical damage and losses are estimated at 15 000 head, with 90 percent of the loss in the south and 10 percent in the Bekaa Valley, mainly in the eastern part (Baalbeck and Hermel). The main causes of physical damage and losses of goat and sheep were: (i) death due to shelling and bombs, particularly with animals that fled in mountainous areas with high incidences of forest fires; (ii) death of starvation and thirst due to the rural exodus; and (iii) death due to shortage of feed, water and lack of healthcare. Furthermore, indirect shocks on goats will resonate for months to come. The effects are: (a) lost milk earnings during the war; (b) low milk production estimated at 30 percent lower than during the usual lactating season; (c) loss of body weight; and (d) deterioration of animal health (it is estimated that 20 percent of milking goats and sheep got severe mastitis). The total financial loss for the sub-sector is estimated at US\$5.030 million.

Poultry

The war had a devastating impact on most poultry farmers in the whole country, but with particular focus on the south of Lebanon. The conflict has weakened the productive capacity, mainly through death of stock breeders and decrease in production. As a result of the crisis, the prices of chicken had already jumped significantly compared to the normal circumstances before the war. The nature of the damages ranges from the physical loss of bird stocks, eggs, buildings, feeds, equipment and machinery to indirect damage such as loss of employment opportunities and revenue income.

Destruction by bombs: (a) four equipped poultry houses in Zahlé, with a total area of 4 575 m², were completely destroyed, with losses of 22 000 meat breeders; there was also a loss of 300 000 hatching eggs due to electricity blackout. The remaining buildings – feed mills, hatcheries, offices and storage buildings – were partially damaged (roof shattering and wall cracking); (b) two equipped poultry houses in Jebel Al Botm village (Caza Tyre), with a total area of 1 800 m², were completely destroyed, with 17 000 broilers ready for sale; (c) two equipped poultry houses in Kfour village (Caza Tyre), with total area of 1 400 m², were completely destroyed, with 16 000 broilers ready for sale; (d) one equipped poultry house in Khariab village (Caza Tyre), with a total area of 800 m², was completely destroyed; (e) there were, as well, 15 poultry houses, covering a total area of 7 500 m², which were partially damaged (roof shattering and wall cracking) and need to be repaired.

Death of birds after rural exodus and rupture of feed stocks and water: The lost birds in both cases are highly impressive, particularly in the heaviest hit areas in the south of Lebanon where most people had left. Even for people who remained, it was impossible to receive feed. The financial loss to the poultry sub-sector is estimated at US\$3.997 million.

The table below shows the overall financial loss of the livestock production sector due to the hostilities, totalling US\$21.862 million.

Estimate of financial losses for livestock production (in US\$)

Livestock Component	Died or Lost (numbers)	Physical Damage*	Income Losses	Total Losses
Dairy cattle	3,050 heads	3,759,125	2,038,660	5,797,785
Fattening cattle	1,250 bulls + 3000 sheep	2,860,000		2,860,000
Beehives	18,000 beehives	2,700,000	1,488,000	4,188,000
Goats and sheep	15,000 heads	1,500,000	3,529,761	5,029,761
Poultry	900,000 broilers**	3,263,908	722,400	3,986,308
Total Losses		14,083,033	7,778,033	21,861,845

* Including buildings

** 54 815 meat breeders + 132 800 chicks + 430 000 hatching eggs + 300 000 broilers

D.3 Fisheries

Physical damage and losses

The most serious damage in the port of Ouzaii resulted in the loss of 328 boats with their gear, the auction hall, cafeteria, meeting rooms, workshop and boat yard. The site has now been cleared with assistance from UNDP (US\$100 000) and the government. The total damage is estimated at US\$3 million, of which the Government of the United Arab Emirates has donated US\$1.8 million directly to the fishing community for rehabilitation; however, demand for over 300 fishing boats has driven up prices. A donor is still being sought to provide the balance of US\$1.1 million, particularly for rebuilding infrastructure.

The damaged cooperative in Aabde was recently built by an international NGO with funding from the United States Agency for International Development (USAID). Unfortunately, this NGO is no longer involved in fisheries. The main damage sustained was to the roof but it appears that there is no structural damage. The costs of making the cooperative fully operational, including repairs to the roof and provision of a small ice plant are estimated at about US\$30 000.

Direct losses of fishing gear and the costs incurred by fishers in cleaning their vessels after the oil spill are impossible to assess accurately. Two agencies are already planning large-scale gear replacements: UNDP has a donation of US\$600 000 from the Government of Canada and USAID will fund CHF International for the same purpose. A note of warning should be sounded as such a large influx of new gear to the industry will inevitably increase the fishing effort in an already fully to overexploited situation. MoA should ensure that the specifications of the gear to be purchased meet legal requirements and monitor the effect of introduction.

Targeting of the trout farms at Hermel in the Bekaa Valley caused losses of fish to 30 farmers with an estimated total of about 300 tonne of fish lost from the ponds. This is a direct loss as the fingerlings and feed have been paid for and even if replaced there will be a lengthy period until the fish can be harvested. An estimate of these losses, based on a price at first sale of US\$3/kg, is around US\$900 000. Subsequently, the market has been depressed and the restaurant trade on which many of the farmers with restaurants on their premises depend for their livelihood has been very much restricted.

Finally, the impact of the oil spill caused the most significant indirect damage. Estimation of the environmental costs of the damage is being undertaken by both the United Nations Environment Programme (UNEP), through a post-conflict environmental assessment, and the World Bank, which fielded a team to determine the environmental impact of the war. International funding was pledged at the Stockholm Conference for the cleanup, and this is well under way. If this does not include cleaning of fishing vessels, then additional funding from other sources will be needed.

Income losses

The most obvious indirect damage to the marine fisheries sector is the loss of income for a prolonged period when there was no fishing and the subsequent reduction in demand. It was particularly unfortunate that this occurred during the peak fishing season. As 42 percent of the catches are in the summer, loss of individual fishers' average income from the enforced tie up of 60 days could amount to US\$1 130/month or, collectively, the loss of vessel income of US\$146 000/day as a result of no landings. Subsequently, the lack of demand discouraged some from returning to fishing as prices in September-October were around half the normal levels. There is some evidence that in order to secure income, fishing pressure increased with higher landings and increased catch per unit effort. The value of the total catch forgone during the enforced tie up of 60 days at US\$4/kg was of the order of US\$8.7 million, of which the share for the owner and the crew can be estimated at two-thirds or US\$5.8 million – this is the money that would have reached the community but excludes employment for workers engaged in ancillary activities, mechanics, etc. Adding this to the direct damage gives an estimate for the most immediate losses of almost US\$9.7 million.

An approximation of the direct and some indirect losses is presented with some reservations in the table below, as many of the indirect losses are complex and difficult to assess. These include the loss of

fishing gear as well as the economic impact of the oil spill and the resultant reduction of demand as a result of consumer concerns about food safety.

Approximate costs of direct and some indirect damage to fisheries

Direct Damage	Losses (US\$)
Ouzaii	3,000,000
Aabde	30,000
Hermel	900,000
Indirect Damage	
Loss of earnings	5,800,000
Total	9,730,000

The government, through the High Relief Committee, provided compensation to a total of 7 285 fishing families. This was organized through the cooperative system and took the form of rations for a family of five for one week with a first cash payment of US\$200. A second cash payment of the same amount was started in the second week of October. The total value of each tranche was US\$1.5 million.

D.4 Forestry

South Lebanon and Nabatiyeh: The livelihoods of these areas depend to a large extent on the natural vegetation for grazing, charcoal making, wood for energy collection, exploitation of *Laurus nobilis* for the extraction of oil as well as the exploitation of other aromatic and medicinal plants, and production of *Pinus pinea* nuts. Due to the hostilities, fires expanded in the forests, other wood lands (OWL) and grass lands. Lighting bombs also caused the eruption of several scattered small forest fires in many locations. Affected forests and wooded and grazing lands in South Lebanon and Nabatiyeh cover 434 ha of oak, pine forests and wooded land. In addition, a strip of about 40 km along the border with Israel in several locations (Labbouna, Merouhin, Ain Ibel, Maroun Er Ras, Aytaroun, El Khyam and Kfar Kila) estimated to cover 400 ha has been cleared from any vegetation for military purpose. The total areas covered by all types of forests (forest, OWL and shrubs) affected directly by the war cover 834 ha in South and Nabatiyeh.

Bekaa: Security risks were very high during the war, car movements were restricted and daily forest activities stopped. Therefore, forests and wood lands could not be protected from forest fire, illegal cutting of trees and grazing. Furthermore, lack of kerosene and high prices, when available, encouraged people to cut trees in the forests and wooded land for fuel. The reforestation project of 60 ha along the border with Syria suffered from lack of maintenance, irrigation and protection from grazing by goats, resulting in the total loss of 36 ha. In the area of Mzraat Bmahrai, around 100 ha of oak coppices were destroyed by fire, probably caused by lighting bombs. Hermel area was subject to heavy bombing which affects the natural vegetation and the Juniperus stands. It is reported that about 400 ha of Juniperus trees were partially affected by fire in this area. The total forest area not directly damaged by the war but by its collateral effect covers 536 ha, which represents about 1.2 percent of the total forest area (of all types) in Bekaa.

Mount Lebanon: Scattered and small forest areas were burned during the war by lighting bombs, mainly in the areas located in the vicinity of the airport and south Beirut (Deir Qoubel). The fire destroyed about 400 ha of *P. pinea* a few days after the war in Jesser Al Qadhi, Armoun, Safraya, Schartoun and Doufoun. Reports confirmed that the number of forest fires and illegal wood cutting in the forests increased during and after the war compared to previous years. Some nurseries remained without water and irrigation for about two months, which led to the death of thousands of seedlings. The direct affected forest area (by fire) during the war covers 70 ha. The indirect affected area covers 400 ha mostly of valuable *P. pinea* forest in Casa Jesser Al Qadhi.

North Lebanon: The total forest area not directly damaged by the war but by its collateral effects covers a total area of 85 ha of pine forests and oak coppices, which represents about 0.4 percent of the total forest cover in the North.

In conclusion, the forest area damaged and the value of lost wood resulting directly from the war is estimated at US\$5.686 million and the indirect loss at about US\$10.190 million.

Type of forest	Area destroyed by fire (ha)		Lost resources (US\$/ha)*	Costs (US\$1 000)	
	Directly	Indirectly		Direct loss	Indirect loss
<i>Pinus pinea</i>	70	330	20,000	1,400	6,600
<i>P. brutia</i>	34	70	17,000	578	1,190
<i>Q. calliprinos/Q. infectoria</i>	400		6,500	2,600	
<i>Juniperus excelsa</i>		600	4,000		2,400
OWL	434		2,000	868	
Shrub land	400		600	240	
Total	1,338	1,000		5,686	10,190
<i>P. pinea</i>					2,139

* Lost wood resources resulting from forest fire and other damage.

Forest fire caused not only the loss of wood products, but also of pine nuts. The direct loss of *P. pinea* forest covers an area of approximately 70 ha. The economic loss of *P. pinea* fruits is estimated at US\$2.139 million (for the time span of 25 years needed for pine trees to regain their fructification).

Fodder is a very important economic input for rural communities in mountains and remote areas. An area of 21 percent of the country is covered by OWL. Fodder is mostly extracted from this area because the shepherds have easier access to it. The most affected areas by the military operations are located in Cazas Hermel, Bekaa West, Baalbeck, Tyre, Saida, Jezzine, Marjayoun, Hasbayeh and Rachaya, which include an estimated area of 60 000 ha of wooded land with trees and without trees used commonly for grazing.

The overall estimated financial loss for the forestry sub-sector is estimated at around US\$15.87 million.

The preliminary assessment of damage and losses to the different sub-sectors are summarized below, totalling around US\$280 million.

Assessment of damage and losses to crops, livestock, fisheries and forestry (US\$ million)	
Crops	232.0
Livestock	21.9
Fisheries	9.7
Forestry	15.9
Grand Total	279.5

II. EARLY RECOVERY NEEDS ASSESSMENT

A. Early Recovery Sector Strategy

Emergency support to the war-affected communities should not simply be punctual in response to the crisis but should comprise actions oriented towards socio-economic development of the agricultural sector, mainly in the affected areas. Fund mobilization and overall efforts should be geared towards enabling farmers and fishers not only to cover their minimum needs to resume pre-conflict economic activities but also to improve their production systems and income-generating capacity. Consequent to the above findings, the early recovery of the most vulnerable farming and fishing communities should contribute to the overall achievement of *three main development objectives*:

- **Increased levels of food security and food self-reliance**
- **Reduction of poverty**
- **Increased standards of living and of personal security**

In order to achieve these general objectives in southern Lebanon, Bekaa, Hermel and other areas hit by the hostilities, the early recovery strategy for the agriculture sector development should aim at:

- optimizing the utilization of resource endowments for increased productivity in agriculture and fisheries, related income and employment on a cost-effective and sustainable basis;
- overcoming the status of stagnating production levels; based on a secure level of production for home consumption the farming communities should be given the means to increase production volumes in order to benefit from existing and new markets inside and outside of their region; and
- ensuring that emergency/short-term initiatives and medium-term rehabilitation efforts are rationally combined in order to form a sound basis for the long-term development of the sector; in this respect, simultaneous institutional building and human resources development will be fundamental to creating the needed implementation capacity and lasting sustainability.

With respect to the latter, a specific medium to long-term recovery and development strategy will be formulated – through a parallel consultancy – with the objective to (1) delineate in detail the needed bridging guidelines between the early recovery stage and medium- to long-term policy and strategy reforms required to modernize the sector, and (2) assist the Ministry of Agriculture in the preparation of a priority medium/long-term Strategic Action Plan for the agriculture sector, and preparation of a strategy document for the Paris III Conference to be held in January 2007. Based, *inter alia*, on the findings of the FAO Damage/Needs Assessment Mission and the World Bank Economic and Social Impact Assessment, the consultancy will: (a) identify the medium- and long-term policy/strategy implications of the proposed early recovery programme for the different types of farming/fishing activities; (b) in the light of the current post-conflict situation, recommend policy changes which are politically and institutionally feasible and might support smallholder agriculture, particularly in southern Lebanon; (c) identify key stakeholders of the commodity chains affected by the conflict (*inter alia*, service and input providers, chambers of commerce, farmers groups, associations and cooperatives, export quality assurance systems and other entities); and (d) elaborate policy instruments/changes through which capacity-building support over the medium-term could contribute to overall sector and export supply chain recovery.

While overall the agricultural sector is expected to bounce back quickly, the same is not necessarily true for the livelihoods of war-affected vulnerable rural households. As stated earlier, many households will remain burdened by asset/harvest/income losses over the medium term and may also suffer from the loss of other sources of income. As a priority, assistance should target the lack of *working capital* which poses the greatest threat to the recovery of the agricultural sector. Seasonal credit is dominated by input suppliers. Lebanese farmers purchase around US\$130 million of inputs per year, of which

US\$100 million are sold on credit by input suppliers. The risk is that farmers and input suppliers will now be unable to pre-finance the 2007 crop because of the cash-flow shortfall from 2006 war-related losses. Therefore, the below recommended early recovery projects are largely designed to address the critical situation of accumulated debt and unavailability of needed working capital amongst the farming communities of southern Lebanon, through appropriate supply of indispensable farm inputs and implements – working capital in kind – crucial to kick-start the revitalization of the sub-sectors¹.

Translated into pragmatic action, the early recovery strategy of the sector should be focusing on:

Urgent/emergency interventions:

- Appropriate and timely supply of basic production inputs (including seeds and fertilizer, livestock, fishing gear and boats, etc.)
- Opening accessible and readily available credit avenues for farmers/fishermen, both women and men
- Initiating the process of infrastructural, institutional and human capacity building

The early recovery projects presented below have been prepared to cover urgent needs. These project proposals, however, do *not aim at covering the huge financial losses of the agricultural sector*, but represent the technical judgment of the mission for a **first pragmatic and operationally feasible set of priority initiatives for urgent implementation within the coming 6-12 months** – especially for the **recovery of the most vulnerable** farming communities. The scale and scope of the early recovery programme recommended has been based, *inter alia*, on the following considerations:

- Immediate needs for some of the most vulnerable and resource-poor farmers, those who depend exclusively on agriculture and have no other resources to recover from the imposed hardship by their own means;
- A realistic dimension of achievable project objectives (especially regarding the number of beneficiaries), given the very restricted timeframe at disposal, of 6-12 months; one has to consider that from day one of a project till the execution of the first direct beneficiaries-related operation, sometimes several weeks, even months, go by (administrative and operational start-up needs, recruitment of staff, procurement of equipment and expendables/inputs, participatory beneficiaries targeting, etc. need time – more so in the very complex situation of south Lebanon);
- The currently very limited government and local implementation capacity for the execution of massive agricultural recovery projects;
- The relatively low priority given to agriculture compared to other sectors in urgent need of recovery, such as infrastructure, housing, health, etc.;
- The indicated donor preference for initiatives to be implemented initially in south Lebanon rather than in other geographical areas;
- The very slow process of de-mining of agricultural fields in south Lebanon posing an almost natural limitation on project achievements and to the pace of related activities within a given timeframe; and
- Similarly, existing localized crop calendar needs have to be respected within any input-related recovery project, and therefore represent, *per se*, a limitation in terms of speediness and number of initiatives to be implemented within a short period of time.

¹ *In addition to the recommended early recovery initiatives, micro-credit programmes already operating in rural areas should be scaled up where capacity permits. Their experience of managing smallholders' post-war debts will provide useful lessons for the design of any new seasonal credit programmes. In addition, immediate assistance could be used to provide long-term loans to commercial banks (and through them to input suppliers) in return for the writing-off of 2006 seasonal financing debts and the extension of new credits to smallholders to support the recovery in 2007.*

Overall, when it comes to the formulation of early recovery needs within a very restricted timeframe and with low levels of local implementation capacity, it is of paramount importance to focus on a realistic perception of the given circumstances listed above. The mission's approach was to design well justified, technically sound, quick-impact projects, with a high probability to attract the needed donor funding and achieve set objectives within 6-12 months of project implementation. However, these proposals should only be seen as a first stepping stone to launch and kick-start a process that will hopefully culminate in the elaboration of further recovery and development projects needed for the rehabilitation of the sector, and will contribute to a comprehensive reconstruction and development programme aimed at restoring the country's sustainable development pattern on which it had embarked prior to the hostilities. At the same time, reconstruction in other sectors (*inter alia*, housing, schools, feeder roads, power supply and bomb clearance) will simultaneously assist families to resume farming in conflict-affected areas.

Furthermore, the elaborated project proposals although detailed to permit rapid implementation are not definitive in nature, i.e., once donor interest is confirmed, working sessions between the donor, MoA and FAO will review and fine-tune the proposals in order to reach a common agreement prior to signature. Therefore, there is still sufficient flexibility for justified modifications even at a later stage.

For the immediate relief and recovery of the most vulnerable and resource-poor farming and fishing communities, the emergency projects below are being recommended for implementation within the immediate 6-12 months:

- **Establishment of an Emergency and Early Recovery Coordination Unit for agriculture-based livelihoods**
- **Emergency assistance to small-scale farmers to resume farming through provision of necessary farm inputs**
- **Emergency assistance for the recovery of smallholder horticulture**
- **Emergency assistance to war-affected, resource-poor livestock keepers in south Lebanon**
- **Emergency assistance for the early recovery of fishing communities**
- **Post-war Forest Cover Damage Assessment Study (satellite imagery)**

B. Specific Early Recovery Needs²

Establishment of an Emergency and Early Recovery Coordination Unit for agriculture-based livelihoods (US\$561 000)

Upon the cessation of hostilities, the government, UN agencies and NGOs started or are planning activities in agriculture, food security and livelihood-related areas. With this intensive start-up of activities, there is urgent need for strengthened coordination within/between the parties involved in the recovery effort – public entities, UN agencies, bilateral cooperation, NGOs and other partners and stakeholders. In order to maximize impact, avoid duplication of efforts/activities and ensure quick coverage of all affected regions with relevant and technically sound projects, the objective should be to establish a pragmatic coordination and implementation tool (an emergency and recovery unit) for quick formulation and execution of rapid impact initiatives geared towards the immediate relief of farming and fishing communities affected by the hostilities. Data need to be centralized and made available to actors involved with agriculture and food security as a means of supporting proper planning and decision-making. Overall, the proposed initiative would contribute to a more efficient utilization of funds and greater cost effectiveness of recovery efforts in the agriculture, fisheries and forestry sectors.

² For each of the proposed early recovery projects, see the respective detailed project proposal(s) in Annex 2.

Therefore, the objective is to create a consolidated approach between the various development partners in order to achieve rapid recovery and rehabilitation of agriculture-based rural livelihoods of the affected communities, thereby contributing to poverty alleviation and increased food security. Furthermore, through the creation of substantial capacity building in-country, the response capacity of government and national partners would be strengthened.

Through the presence of an Emergency/Recovery Coordination Unit based in the country, the various actors will be provided with the necessary technical support and guidance. The strengthened coordination function will establish a platform for regular meetings, information-sharing and data collection and will encourage collaboration in joint rapid livelihoods and agriculture assessments, creating synergies, linkages and partnerships between various actors. Implementation of quick response projects would be done through local partners, such as NGOs, in collaboration with government and UN agencies. The Emergency/Recovery Coordination Unit would, *inter alia*:

- establish an office in the southern town of Tyre (UN facilities), where many of the local development partners are located, and set up operational facilities;
- strengthen contacts with/amongst the current and potential stakeholders operating in agriculture/livelihoods emergency and recovery initiatives in south Lebanon;
- collect and centralize related data and information requirements and make it accessible to stakeholders; monitor the food security situation in the affected areas;
- provide technical support to humanitarian/development partners and local municipalities in agriculture and fishing-related livelihoods recovery initiatives, as well as in the formulation and implementation of related recovery projects;
- create a forum for regular meetings and consolidated action by all development partners for the early recovery of agricultural and fishing communities, with special emphasis on livelihood development, food security and poverty alleviation; hold information meetings at regional and central (Beirut) levels;
- verify the various ongoing and planned projects and initiatives of the various partners, point out potential geographical and/or subject-matter-related duplications and suboptimal distribution of resources, as well as necessary synergies, and facilitate respectively a coordinated verification of initiatives;
- identify and facilitate the implementation of localized assessments/studies, identify ad hoc needs where and whenever necessary and formulate respective project proposals for donor funding;
- in a participatory work in progress, streamline all agricultural recovery initiatives planned for the recovery of the farming and fishing communities in south Lebanon; and
- coordinate and supervise implementation of donor-funded emergency and recovery projects.

The Emergency/Recovery Coordination Unit – headed by an international emergency coordinator and assisted by a national agronomist – would be based in Tyre (south Lebanon) in order to facilitate direct contact with local partners and municipalities. It would institutionally be linked to MoA in order to benefit from its technical and operational setting. The major partners within the coordination effort would be, *inter alia*: government entities, especially MoA; UN agencies, especially UNDP and UNMACC (agricultural recovery in post-clearing); bilateral cooperation; international NGOs; national NGOs; community-based organizations (CBOs); local municipality committees (existing or to be created, where needed); and farming/fishing cooperatives/associations/groups.

The implementation of emergency and recovery projects would be carried out with the support of NGOs, and facilitated by municipality committees and CBOs – but supervised and monitored by the FAO Emergency/Recovery Coordination Unit.

Emergency assistance to small-scale farmers to resume farming through provision of necessary farm inputs

(US\$4 969 800)

As de-mining is a pre-requisite for any safe resumption of agricultural activity in many farms in Nabatiyeh and South, unexploded ordnance will need to be cleared before the initiation of project activities and the reestablishment of agriculture. This will be achieved through coordination between FAO/MoA, UNMACC, NDO, the Lebanese army and the concerned municipalities.

Due to the unavailability of working capital and the accumulated debt burden, many of the affected families who live exclusively from agriculture find themselves unable to resume their agricultural activities in order to satisfy their minimum daily needs. Providing farmers with the minimum agricultural inputs (seed and seedlings, fertilizers, pesticides, small irrigation equipment, etc.) will help resume their agricultural activities and encourage them to remain in rural areas rather than becoming another burden on the suburbs of towns – as an alternative to the direct provision of agricultural inputs to the farmers, a voucher system could be used which would refinance the input suppliers thereby contributing also to the recovery of the supply chain.

The overall objective of the assistance is to urgently enable early recovery needs and immediate relief to the lives and livelihoods of 4 500 of the most vulnerable farming families (31 500 direct beneficiaries) – with critical physical damage and significant crop harvest losses – in the governorates of Nabatiyeh and South that were severely hit by the July/August 2006 hostilities. The project is aiming to provide the conditions to affected farmers to restore a minimum capacity of production and of income generation. The specific objectives of this project are to:

- *provide crucial farm inputs* – seeds, fertilizer, implements and small-scale irrigation equipment for open-field crops, greenhouse vegetables, flower production and fruit trees (including citrus and olives);
- *rehabilitate agricultural activities:*
 - replacement of destroyed citrus orchards with new plantations using new high-yielding cultivars and high-planting density (double the number of trees per area) and implementing drip irrigation, where appropriate;
 - replacement of destroyed olive orchards with new plantations using new high-yielding cultivars and high planting density (double the number of trees per area);
 - replacement of destroyed banana orchards with new plantations using healthy plantlets (from tissue culture) and drip irrigation, where appropriate; and
 - replacement of the destroyed greenhouses.
- *provide training to farmers and farm workers* on Good Agricultural Practices in open-field crops and greenhouse crops (planting material quality; adequate planting density; adequate cultural practices; rational use of fertilizers and pesticides); and
- *de-mine agricultural land and farm holdings* accompanied by an evaluation of the quality of soil and surface water. De-mining is to be conducted in collaboration with UNMACC and the Lebanese army. The funds relevant to this task will be covered by other UN organizations. Analysis of soil and water for any contaminants resulting from weapons used during the war (*inter alia*, uranium). This is to be conducted in collaboration with the Ministry of Environment.

Coordination between FAO/MoA, UNMACC, NDO, the Lebanese army and the concerned municipalities is needed to locate all contaminated fields. This will require some surveys but also overlaying of agricultural maps (latest satellite images) with the existing maps of strikes and cluster bomb locations. Only then can one prioritize the fields which need to be de-mined first, and which fields could wait until a later stage. This prioritization should take into consideration the crop calendar needs (harvest, planting, crop care, etc.) as well as the individual urgency from the point of view of the agricultural income-dependency of the landowner.

Emergency assistance for the recovery of smallholder horticulture

(US\$4 032 050)

The hostilities had a devastating impact and hardship on the horticulture sub-sector throughout Lebanon. Beyond the direct physical losses there is immediate impact on employment and revenue-generation capacity for several thousands of households in all of Lebanon. Unless action is taken to help the most vulnerable farming population, there will be a lack of confidence to confine investment and entrepreneurial activities to the agricultural sector. In this respect, the increasing level of rural unemployment in the country affects mainly the young population – this matter is subject of great concern to the government authorities as it may lead to social unrest. The recovery of the labour-intensive horticulture sector is expected to contribute to the creation of job opportunities and adequate income for the small farmers.

The overall objectives of the project are to re-initiate horticulture production and increase farmers' revenues in the fruit and vegetable sector by optimal use of the production factors, improving product quality to better respond to market demand and supporting new marketing channels for agricultural products. There will be three components to this project: (a) perennial crops such as fruit trees; (b) field crops (potato, onion and other vegetables); and (c) greenhouse crops (tomato, cucumber, flowers, etc.). The immediate objective of the assistance is to enable immediate relief to the lives and livelihoods of 3 000 resource-poor and vulnerable horticulture farmers – with critical crop harvest losses – who were severely hit by the July/August 2006 hostilities in all of Lebanon (21 000 direct beneficiaries). The specific objectives of this project are to:

- *rehabilitate horticultural activities:*
 - replacement of the current/damaged greenhouse tunnels with improved tunnels that allow better crop ventilation;
 - replacement of destroyed citrus orchards with new plantations using new high-yielding cultivars and high planting density (double the number of trees per area) and implementing drip irrigation, where appropriate;
 - replacement of destroyed olive orchards with new plantations using new high-yielding cultivars and high planting density (double the number of trees per area);
 - replacement of destroyed fruit tree orchards with new plantations using new high-yielding cultivars and high planting density (double the number of trees per area); and
 - replacement of destroyed banana orchards with new plantations using healthy plantlets (from tissue culture) and drip irrigation where appropriate.
- *provide for localized/adapted irrigation equipment and needed inputs* to major irrigated crops – open field and greenhouse vegetable and flower production, fruit trees (citrus, olive, etc.) and grapes; and
- *provide training to farmers and farm workers* on Good Agricultural Practices (GAP) in open-field crops and greenhouse crops (planting material quality, adequate planting density, adequate cultural practices, rational use of fertilizers and pesticides, group marketing).

The assistance will strengthen the national horticulture sector in Lebanon and, more specifically, contribute to restoring the small-scale farmer's capability to produce high-quality and safe fruits and vegetables. The project aims at improving horticulture practices in Lebanon (improved cultivars, improved planting densities, improved greenhouse structure, GAP, water-use efficiency, rational use of fertilizers and pesticides and production of safe fruits and vegetables).

Emergency assistance to war-affected, resource-poor livestock keepers in south Lebanon

(US\$5 995 497)

The project is designed to bring immediate relief to those vulnerable livestock farmers in the south of Lebanon who were directly affected by the hostilities either through physical damage or financial losses. The major intervention would have a quick and high impact in order to restore some form of normalcy to the lives of those affected low-income households. Most of the smallholders have lost, partially or totally, their main livestock production assets. Thus, the most urgent interventions will be carried out on restocking and distribution of animals (cattle, goats, sheep, horses and chicks) and beehives. Emphasis will also be placed on accompanying measures that would have the greatest potential to contribute to rapid improvements of livestock productivity in affected areas, particularly: provision of veterinary drugs to cope with potential diseases, provision of feed for three months (winter time) and provision of small equipment for dairy handling, hygiene and processing at the farm level.

The overall objective is to urgently enable early recovery and immediate relief to the livelihoods of 1 500 vulnerable livestock keepers (one-third are women-headed families) in the south of Lebanon, who were severely hit by the 2006 hostilities (10 500 direct beneficiaries). An additional 2 000 farmers will draw indirect benefits from the project through training and veterinary services. The proposed project is therefore aiming to provide the basis for livestock keepers and farmers to resume production and income-generation activities after the July/August 2006 hostilities. The specific objectives of the project are to:

- initiate comprehensive emergency measures to support the war-affected livestock smallholders mainly by restocking and distribution of animals (cattle, goats, sheep, draft animal power and chicks) and beehives;
- assist war-affected livestock farmers to improve animal production through provision of supplementary livestock feeds and improved healthcare;
- assist a core group of leading women-headed households from war-affected villages with small equipment for milk handling, hygiene and basic milk processing in order to improve milk quality standards, reduce the work burden on the women as well as increase their income by gaining some added value over the price of milk;
- strengthen capacity building of project beneficiaries, including rural youth and women, as well as extension staff from MoA, NGOs and other related entities;
- improve the competitiveness of the sub-sector and alleviate the increasing rural exodus by diversifying and improving farm income;
- assist farming communities in organizing the resumption of their honey, milk, poultry, feed and forage production and marketing;
- improve the food security and nutritional and economic status of low-income rural families while training farmers on health safety of consuming locally produced milk; and
- prevent and eradicate zoonotic and reproductive diseases.

In order to sustain activities, particularly to make good use of the proposed interventions and considering the limited skills of farmers as well as the shortage of extension service in MoA, emphasis will be given to training and capacity building of the project beneficiaries, including rural youth and women. The training messages will cover all interventions and provide advice on poultry management, honeybee management, large- and small-ruminant management, forage development, animal health, milk handling, hygiene and basic milk processing at the farm level. The project will also strengthen the capacity of the Animal Production and Health Services of MoA to sustain and complete the process beyond the lifetime of the project.

Emergency assistance for the early recovery of fishing communities

(US\$1 344 750)

Except for the emergency assistance described below, the immediate physical needs of fishing communities resulting from hostilities have largely been met through the government and donor assistance indicated above. However, the impact of the oil spill on fisheries needs to be monitored from a food safety as well as an environmental perspective. MoA should play a leading role in this. In view of scientific results demonstrating that fish collected from the affected areas are safe to eat, the Ministry should take immediate steps to bring this to the attention of consumers through newspapers, radio and TV, pointing out that the situation is being monitored in case of changes. For the wellbeing of the industry, it is urgent to do this immediately without waiting for donor funding.

There are obvious medium- and longer-term recovery needs that should be addressed for the future wellbeing of this community. These are tied up with the development needs, which, given the troubled recent history of Lebanon, have so far not been adequately considered. The most important requirement is to conduct a comprehensive stock assessment as a basis for decision on the future of the industry. No encouragement to expansion should be given until this information is available. This would include the introduction of excessive quantities of new fishing gear financed by donors. At present, almost all fishing is within six miles of the coast. The further six miles of territorial waters are certain to be less productive but would give some opportunities for expansion. However, this would require larger and better-equipped vessels. If a stock assessment indicated potential for growth, there would need to be a replacement of some of the fleet and an improvement in fishing gear and fishing techniques. The government, through MoA, should, in any case, take a stronger approach to fisheries management in order to control entry, mesh sizes of nets, catching of excessive quantities of juvenile fish and many other parameters. If there is the will to do this, and it is probably essential for long-term stability, technical assistance and capacity development in the Fisheries and Natural Resources Department will be necessary.

The areas of immediate need that have been identified, but are not yet covered by donor assistance, include completion of the rehabilitation at Ouzaii port, repair of the cooperative at Aabde and recovery of the trout farms in Hermel. Although donors may have already provided funding to cover these early recovery needs, a project that covers them all within the same overall framework is recommended. The total damage to the Ouzaii port is estimated at US\$3 million, of which the Government of the United Arab Emirates has already donated US\$1.8 million directly to the fishing community for rehabilitation. The balance of US\$1.1 million is required, particularly for rebuilding the infrastructure. The main requirement now is to replace the facilities, but, so far, no comprehensive design has been produced. It would be unfortunate if this unique opportunity to construct a properly designed fish landing terminal, complete with auction hall, storage, ice plant, office accommodation, cafeteria, boatyard and mechanical workshop were lost. In Aabde, repair of the cooperative auction hall and retail sales area and installation of an ice plant at a cost of US\$30 000 would bring the complex up to the required standards for hygienic operation. At present, auctions take place under unhygienic conditions in private facilities nearby. In Hermel, the trout ponds have been repaired, but production cannot recommence until the farmers obtain both fish eggs and feed estimated at around US\$900 000.

The project will address the most urgent early recovery needs of the fisheries sector that have been identified, but, as yet, not covered by donor support: in Ouzaii – to design and construct a modern fish landing and sales complex to replace that destroyed by the war; in Aabde – to repair the damage to the cooperative auction hall and retail facilities; and in Hermel – to provide fish eggs and feed to enable the fish farmers to resume production.

Post-war Forest Cover Damage Assessment Study (satellite imagery)(US\$106 674)

As post-war satellite images have not yet been analyzed, no exact figures on forest cover damage are available in order to elaborate the details of a possible forest recovery programme. No verifiable assessment of the burned surface area, type of burned species and environmental and socio-economic impact has yet been carried out. However, for the time being, a rough estimate by MoA/FAO of the total burned area has been produced: more than 100 ha of forests in Mount Lebanon were burned during the war and more than 900 ha directly after the war. In south Lebanon, more than 800 ha of forests and other wooded land were burned during the war. The project proposes to compare the existing pre-war satellite images, maps and studies related to forests and other wooded lands with new post-war images in order to exactly assess the direct and indirect damages caused by the war and post-war consequences. The project also proposes to undertake a rapid socio-economic analysis in order to better understand the losses caused to the local community groups in the affected areas.

The overall objective of the assistance is to help Lebanon recover from the hostilities that occurred in summer 2006, especially the forestry-dependent vulnerable groups whose sustainable livelihoods were severely affected. The specific objectives of the proposed project are to: (i) assess, from satellite images, the exact locations and extent of forest and other wooded land burned or affected by the hostilities; (ii) assess, through field surveys, the magnitude of the damage and its environmental and socio-economic impact on the locations and local communities; and (iii) propose site-specific mitigation efforts.

Early Recovery Programme for the most vulnerable farming and fishing communities affected by the hostilities	
Proposed project	Budget (US\$)
Establishment of an Emergency and Early Recovery Coordination Unit for agriculture-based livelihoods	561,000
Emergency assistance to small-scale farmers to resume farming through provision of necessary farm inputs *	4,969,800
Emergency assistance for the recovery of smallholder horticulture	4,032,050
Emergency assistance to war-affected, resource-poor livestock keepers in south Lebanon	5,995,497
Emergency assistance for the early recovery of fishing communities	1,344,750
Post-war Forest Cover Damage Assessment Study (satellite imagery)	106,674
Grand Total	17,009,771

* This assistance is composed of two clone projects – for Nabatiyeh (US\$1 930 500) and South (US\$3 039 300).

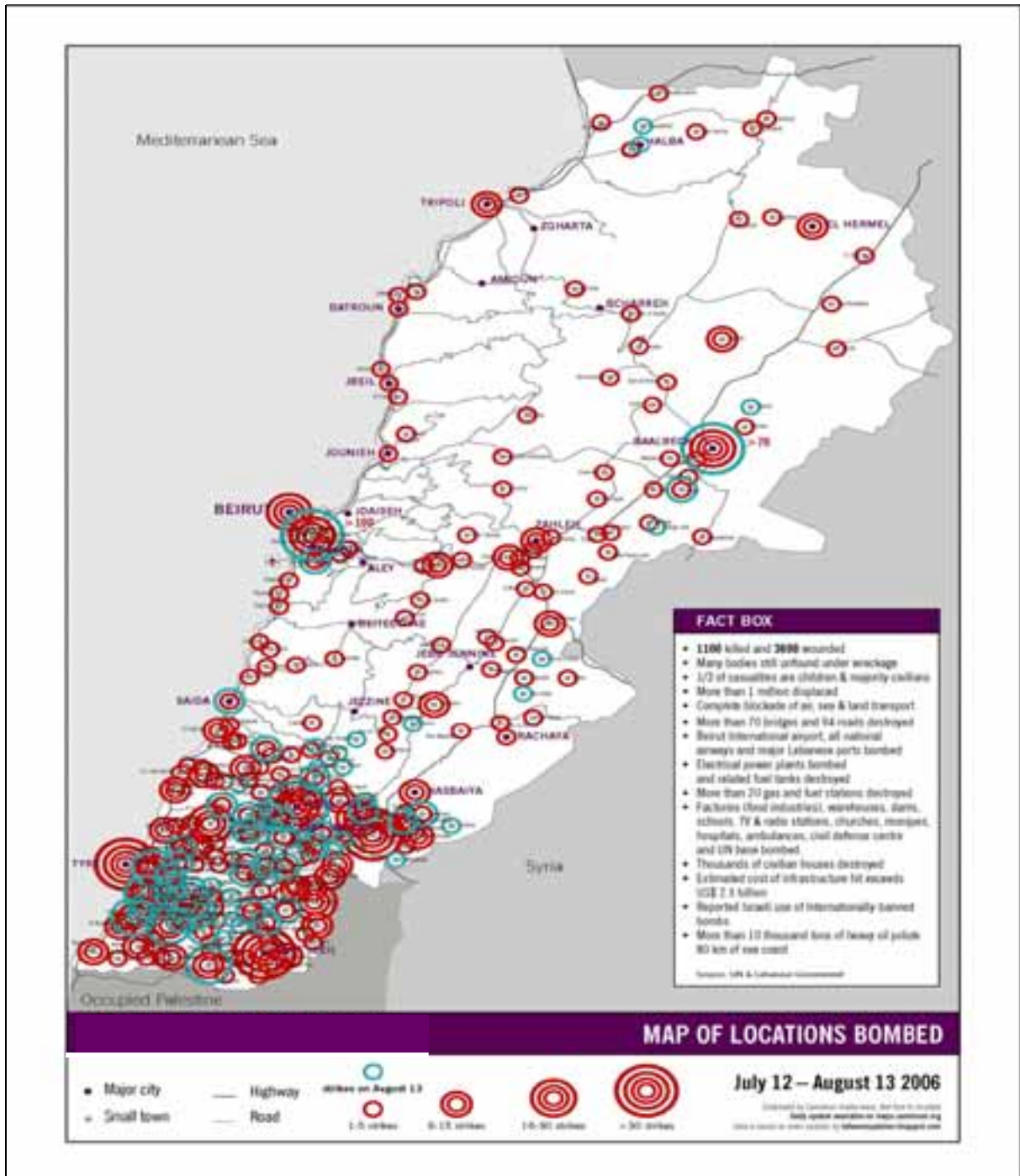
ANNEX 1 – Lebanon Maps

A. Lebanon

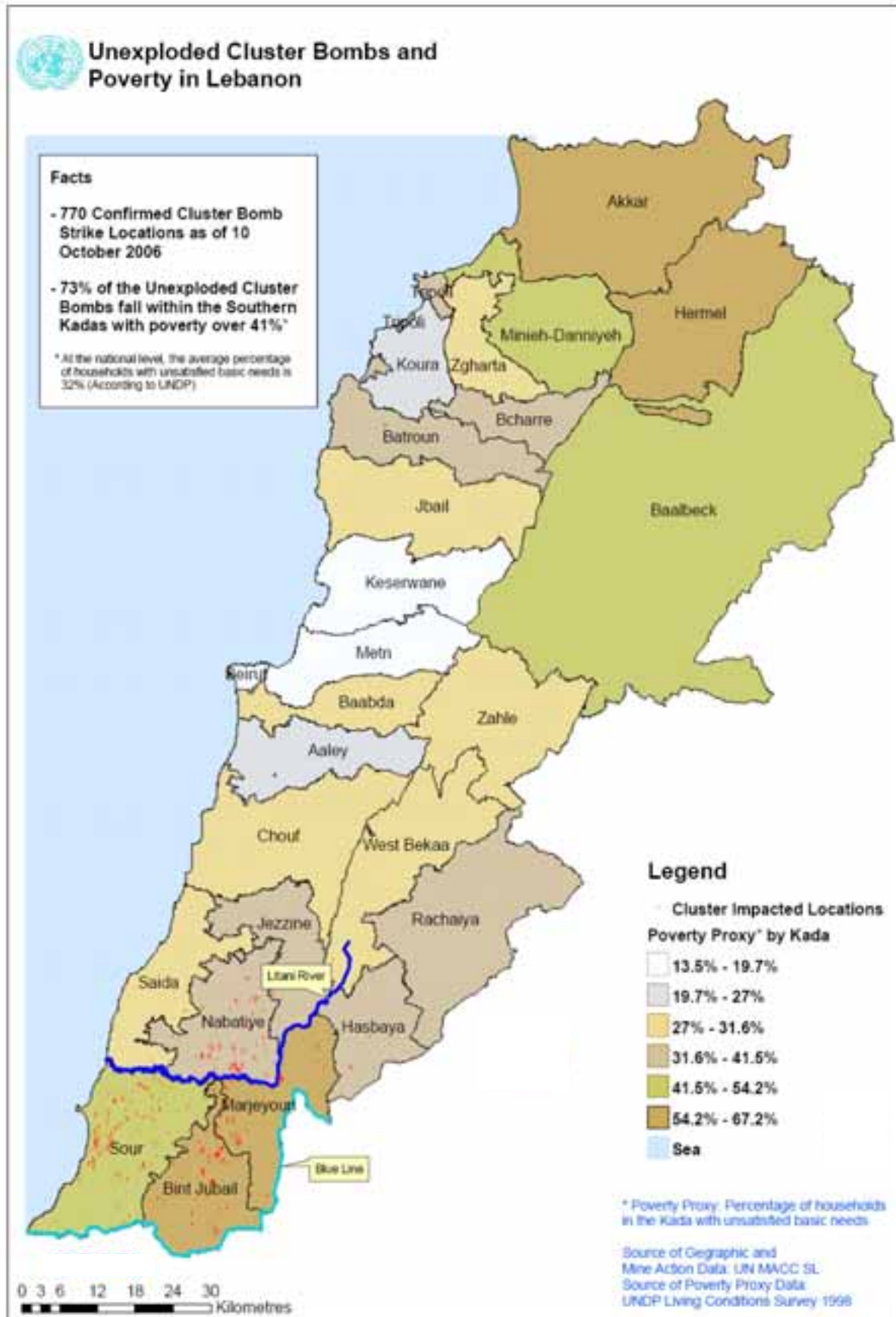


Source: <http://www.reliefweb.int/rw/rwb.nsf/doc404?OpenForm&rc=3&cc=lb>

B. Map of Locations Bombed



C. Poverty and War-Affected Areas



D. Cluster Strike Locations and Land Use

