Investing in rural people

Republic of Lebanon

Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Detailed Design Report

Main report and appendices

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Near East, North Africa and Europe Division
Programme Management Department

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Currency equivalents

Currency Unit	=	
USD 1.0	=	

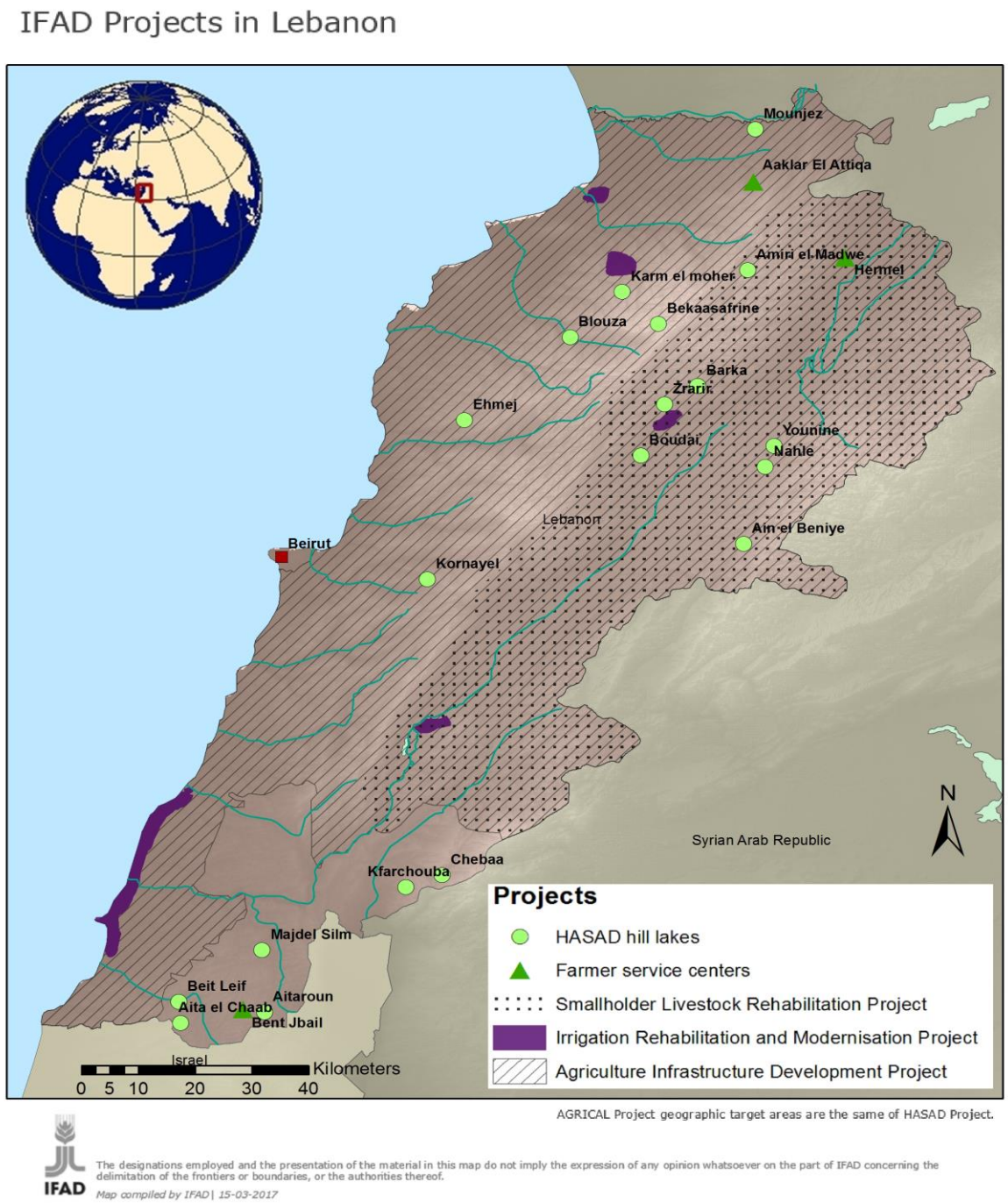
Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

Abbreviations and acronyms

AIDP	Agriculture Infrastructure Development Project
ADR	Association for the Development of Rural Capacities
AgriCAL	Enhancing Adaptive Capacity of the Rural Communities in Lebanon
CW	Concern Worldwide
CDO	Controlled Designation of Origin
DELPM	Department for Economics, Livestock Processing and Marketing
DLPB	Department for Livestock Production and Breeding
DAR	Directorate of Animal Resources
DEICVQ	Department of Export and Import Control and Veterinary Quarantine
DAH	Department for Animal Health
FMD	Foot and Mouth Disease
FSSWG	Food Security Sector Working Group
GDC	General Directorate of Cooperatives
HASAD	Hilly Areas Sustainable Agricultural Development" project
IOM	International Organization for Migration
IPSAS	International Accounting Standards
ISA	International Standards on Auditing
LCRP	Lebanon Crisis Response Plan
LIBNOR	Lebanese Standards Institution
LMA	Lebanon Micro Finance Association
LSD	Lumpy Skin Disease
MEW	Ministry of Energy and Water
NADIS	National Animal Disease Information System
OIE	World Organization for Animal Health
PPR	Small Ruminants' Plague
RIMS	Results and Impact Management System
RDC	Rural Delights Cooperative
SLRP	Smallholder Livestock Rehabilitation Project
TVET	Technical Vocational and Educational Training

Map of the project area



Executive Summary[1]

1. Lebanon is a small upper middle- income open country with a population of 4.5 million people in 2015, not taking into account about 1.5 million Syrian and 450,000 Palestinians refugees residing in the country. GDP growth for 2016 was estimated at 1.8%, reflecting the impact of regional turmoil. The Syrian refugee crisis has resulted in unprecedented social and economic challenges to Lebanon, putting further stains on its resources, public services and infrastructure and placing Lebanon as the country with the highest number of refugees per capita in the world. For every 1,000 residents of Lebanon, roughly 182 Syrian refugees were in the country in 2016, according to the UNHCR. The registered Syrian refugees account for more than 20% of the total population.

2. In order to cope with the crisis situation, the GoL launched the Lebanon Crisis Response Plan (LCRP) in 2015 as a strategic framework to allow the Government, national and international partners to come together to deliver integrated and mutually reinforcing humanitarian and stabilization interventions. LCRP is organized along seven strategic sectors, including one on food security which is led by MoA, FAO and WFP.

3. Like many other UN agencies and donors, IFAD joined the international community in helping the countries affected by the Syrian crisis to cope with the situation. Accordingly, and in recognition of the rural dimension of the crisis, IFAD has established a Facility for Refugees, Migrants, Forced Displacement and Rural Stability, or FARMS. The goal of the facility is to ensure that poor rural people overcome poverty through remunerative, sustainable and resilient livelihoods. In host areas, livelihoods for both the host communities and the displaced peoples will be generated.

4. Although Lebanon is a high middle income country, 28.6% of Lebanese households are poor and of these, 8% are considered extremely poor or below the lower poverty line (USD 2.40/person/day). More than 20% of households engaged in agriculture fall below the extreme poverty line. Poverty is prevalent mainly in the rural provinces of Akkar, North and South Lebanon and Baalbek-Hermel.

5. Within agriculture, livestock is an important sector. Livestock production relies on cattle (77,000 heads in total, 10,400 farms, average 7 heads/holding), sheep (350,000 heads in total, 4,100 arms, 85 heads/holding) and goats (450,000 heads in total, 5,850 farms, 75 heads/holding). Cattle are reared for milk mainly, goats for both purposes and sheep mainly for meat. The need for (i) improving the competitiveness of the local dairy sector; (ii) enhancing quality and food safety of local dairy products, and (iii) reinforcing the role of dairy cooperatives is clearly outlined in the MOA strategy 2015-2019.

6. The demand for local dairy products in Lebanon is high, with a level of consumption per capita of 114 liters (FAO, 2013). This demand has been boosted by the influx of refugees from Syria, where consumption of dairy products, especially traditionally processed ones, is part of consumption habits. The local milk production (390,000 t per year) is not in position to satisfy

[1] The detailed and final design missions were managed and supervised by Mr. Tarek Kotb (IFAD Country Programme Manager). The mission consisted of Mr. Abdelhamid Abdouli (Mission Leader), Mr. Antonio Rota (Lead Technical Advisor/Livestock, PTA, IFAD), Mr. Alban Bellinguez (Livestock Development Specialist), Mr. Mikael Andersson (Financial Management Specialist, IFAD), Mr. Majid Benabdellah (Economic and Financial Specialist), Ms. Sawsan Hassan (Rangelands, Environment Specialist), Mr. Mohamed Al Ghazali (M&E Specialist), Ms. Shazreh Hussein (Targeting and Gender Development Specialist), Mr. Mohieddine Hilali (Dairy Processing Specialist), Mr. Marc de Sousa Shield (Rural Finance Specialist), Ms. Nathalie Gebrayel (Procurement Specialist), Mr. Yonas Mikonen (Programme Officer, IFAD), Ms. Sawsan Mehdi (Rural Development Specialist), and Mr. Youssef Ibrahim (Environment Specialist).

this demand, both in terms of quantity and consumer quality expectations, and the country therefore imports around half of its consumption (356,000 mt equivalent per year).

7. Cow milk represents the largest share of milk production (95%) and goat and sheep milk represent respectively 3% and 2% of the total production. Goat and sheep milk production are seasonal (November to June) unlike cow milk production which is permanent.

8. The largest part of the national production (300,000 tons - 80% of the production) is marketed through the informal and semi artisanal/small scale processing sector, without being directly affected by strong competition from imported powder milk used by six large processors (Taanayel Les Fermes/Bonjus, Dairy Khoury, Liban Lait, Dairy Day, Dainka Dairy, and Jdita).

9. Dairy cattle production systems are largely landless and vary in size, with smallholder systems owning 2 to 10 cows, medium size units with 11 to 30 animals, but also large and modern units integrated to industrial processing units. Sheep and goat milk is used for the production of traditional products such as laban, labneh, kishk, halloum cheese, Akkawi-Checki cheese, and baladi cheeses like double creme, bulghari, and Nabulsi.

10. The dairy sector suffers from several problems, including: inadequate animal feeding; weak animal health system; small and fragmented farms; decreasing crop/forage land and productivity of pastures for small ruminants; low animal yields, and insufficient capacity for product collection and processing, and overall high dairy production cost due largely to high animal feed cost.

11. The overall goal of the project is to contribute to the reduction of rural poverty of resource-poor Lebanese rural households and Syrian refugees. The development objectives of the project are: (i) to increase the income of smallholder dairy producers and processors, and (ii) to increase in employment opportunities of young Lebanese in communities affected by the Syrian crisis and young Syrians living in these areas.

12. HALEPP is designed to address most of the smallholder dairy sector constraints as per its following theory of change: There is strong demand for good quality dairy products obtained through small scale processing of fresh milk. Consumers are willing to pay a high quality premium price for better quality milk. Currently the small dairy producers are not able to penetrate this rewarding market. They not only pay a high price for animal feed but also produce and process low quality milk and dairy products. Higher productivity per head through better feeding, reduced animal feed cost and improved animal health together with value addition to good quality raw milk into hygienic processing would sustainably increase smallholder dairy producers and processors income and enhance food security in the country. The same theory of change would apply to the Syrian refugees engaged in dairy production and on-farm processing, being it now as refugees in Lebanon or eventually upon their return to Syria.

13. The project will concentrate its efforts on four aspects: (i) reduction of production costs by using adequate rations with more quality fodder and less concentrate, (ii) improvement of productivity per animal, through better feeding associated with better management of herds/flocks and reduced impact of animal diseases, (iii) improvement of the quality of milk and dairy products through better hygiene at milk handling and processing, and (iv) enhancement of market access and marketing opportunities.

14. The project would be national in scope and cover all 7 governorates: Mount Lebanon, North Lebanon, Akkar, Bekaa, Baalbek-Hermel, Nabatieh and South Lebanon. The project would largely focus on the Lebanese communities who are among the poorest and the most affected by the influx of Syrian refugees as well as Syrian refugees by implementing its interventions in the 251 poorest cadasters out of a total of 1,653 cadasters in the country. The 251 cadastres are home to 67% of the most deprived Lebanese and 87% of Syrians refugees.

15. The project would target about (i) 2,400 smallholder cattle farmers and 1,600 small ruminant farmers. It is estimated that this would constitute nearly 30% of all farmers owning up to 7 cows

and 21% of all small ruminant farmers with herds of up to 200; (ii) 1,500 smallholder on-farm processors, mostly women; and (iii) 80 small to medium off-farm processors; and (v) 500 young Lebanese in host communities affected by the Syrian crisis and Syrian refugees, seeking employment in agriculture and agro-processing and rural infrastructure. In all the project interventions, there would be a strong focus on women who represent a specific target for IFAD, due to their traditional relevance in livestock production, their growing social and economic responsibility, and their vulnerable position in societies. Up to 30% of project target would be Syrian refugees.

16. In addition to the Project Coordination and Management component, the project would include two technical components: (i) enhancing competitiveness of smallholder dairy producers; and (ii) improving small-scale value addition and access to market.

17. The expected outcome of the first component is higher and sustainable supply of good quality milk at the level of smallholder dairy farmers. This would be achieved through outputs delivered under two sub components: (i) improving capacities of targeted smallholder dairy farmers; and (ii) improving animal management and productivity of cattle dairy herds and small ruminants' flocks in the project area.

18. The expected outcome of the second component is better quality dairy products at smallholder household processing level and off-farm small and mid-size dairy processing level. This would be achieved through outputs delivered under three sub components: (i) supporting aggregation and value addition, (ii) improving access to Rural Finance, and (iii) supporting a dairy stakeholder platform for inclusive policy dialogue.

19. With regards to project implementation, a Project Directorate with qualified staff recruited on a competitive basis would be established at the Ministry of Agriculture, reporting directly to the Office of the Minister through the Animal Resources Directorate. It would work closely with the most relevant entities within the MOA, i.e. Animal Resources Directorate, Education and Extension Service, and General Directorate of Cooperatives. Project implementation would combine making use of these directorates and outsourcing to qualified institutions (universities and international organisations), NGOs and private service providers. Their involvement would be through call for proposals and performance based MoUs.

20. The total project costs, for a period of six years, are estimated at USD 12.5 million. Investment costs represent 64.6% of total costs. Recurrent costs accounting for 35.4% of total costs. Project cost would be financed as follows: IFAD loan of USD 4.9 million and grant of USD 0.6 million, FARMS grant of USD 5 million, Government contribution of USD 1.8 million equivalent and beneficiaries contribution of USD 0.2 million equivalent.

21. HALEPP project is in line with IFAD Strategic Framework 2016-2025, NEN Country Strategic Note for Lebanon and relevant IFAD policies. The project activities, implementation arrangements and M&E system have been designed in compliance with IFAD Targeting Policy, IFAD policy on gender equality and women's empowerment and in line with the approaches outlined in the Framework for Gender Mainstreaming in IFAD investment Operations. The project is designed to be consistent with IFAD's Private Sector Development and Partnership Strategy, its Rural Finance Policy and the associated Decision Tools for Rural Finance. The preliminary Environmental and Social category is B, considering that the project approach will promote use of climate resilient technologies (e.g. solar energy and biogas technologies), and improved management of animal raising and dairy processing.

22. As 67% of the most deprived Lebanese and 87% of Syrians live in the same vulnerable areas covered by HALEPP, FARMS co-financing of HALEPP project is a good opportunity to help the two communities co-exist in harmony with less friction which is caused by limited resources at their disposal. In addition to supporting Lebanese and Syrian smallholder dairy producers and processors in communities affected by the Syrian crisis, HALEPP would also put at the disposal of Lebanese farmers and processors a pool of qualified Syrian workers for on-farm and off-farm employment in areas much less attractive to the young Lebanese. FARMS and HALEPP are

aligned in terms of geographical coverage, overall goals, development objectives, outcomes, and financing plan.

23. The EIRR on the investments in the HALEPP project area over 15 years is estimated at 15.6%. The Net present value (NPV) of the project is positive (USD 27.9 million) and the Benefit-cost ratio is 3.7. The economic analysis suggests that the HALEPP project is feasible. With an opportunity cost of capital (OCC) of 9%, these worthiness indicators establish the economic feasibility of the project. The sensitivity tests of the profitability suggests that the project is robust and worthwhile.

Logical Framework

Results Hierarchy	Indicators (indicators will be disaggregated by age and gender. Up to 30% of beneficiaries will be Syrian refugees). Baseline figures will be updated after baseline survey in year one				Means of Verification			Assumptions and Risks
	Name	**Baseline**	**Mid-Term**	**End Target**	**Source**	**Frequency**	**Responsibility**	
Goal: *contribution to reduction of rural poverty of resource-poor Lebanese rural households and Syrian refugees.*	▪ % of people experiencing economic mobility (RIMS 3 CI1, SDG target 1.1 & 1.2	- %	20%	50%	RIMS baseline and impact survey	Baseline and Completion	PD, M&E officer	▪ Security setback due to unpredictable situation in Lebanon and neighbouring countries (R) ▪ Stable macroeconomic context (A)
	▪ % of people with improved food security	- %	30%	60%				
Development Objectives: *(i) to increase the income of smallholder dairy producers and processors, and (ii) increase in employment opportunities of young Lebanese in communities affected by the Syrian crisis and young Syrians living in these communities*	▪ % increase in smallholder dairy producers and processors incomes (RIMS 3)	producers 200 USD /cow, processor 500ltrs 12,000 USD	10%	20%	Project Monitoring reports	Annually	M&E officer	
	▪ Number of FTE employment opportunities created (RIMS2, CI 2.5.1)		1000	3000	Project Monitoring reports	Baseline and Completion	M&E officer	
	▪ Percentage of persons / households reporting positive integration with host communities	- %	15%	30%	Project Monitoring reports	Baseline and Completion	M&E officer	
Outcome 1: milk production improved in quality and yield	▪ % decrease in cost of production per litre of milk (RIMS2, CI 2.2.2) ▪ % increase in milk productivity (liter per animal (RIMS 2) ▪ % of disease outbreaks reduction (RIMS2)	500 LBP/liter - % 3750 cow 45 sheep 113 goat 0% 600 -	10% 10% 30%	30% 25% 50%	Trade statistics and Project M&E system	Baseline and Completion	M&E officer	Agents and collectors opposed to direct linkages between producers and processors (R)

Results Hierarchy	Indicators (indicators will be disaggregated by age and gender. Up to 30% of beneficiaries will be Syrian refugees). Baseline figures will be updated after baseline survey in year one				Means of Verification			Assumptions and Risks
	Name	**Baseline**	**Mid-Term**	**End Target**	**Source**	**Frequency**	**Responsibility**	
Outputs: 1.1 Technical knowledge and skills of smallholder farmers are improved	▪ No. of Smallholder farmers benefitting from extension (RIMS1)		1,500	4,000	Project Monitoring reports	Quarterly	M&E officer	
1.2 Animal health status of the dairy herd and flock is improved	▪ National Animal Disease Information System revamped (RIMS2)		1	1				
Outcome 2: quality, diversification and sale of dairy products improved for on-farm and off-farm dairy processing	▪ % increase in dairy products for supported processors (RIMS 2, CI 3) – SDG target 2.3 & 10.2) ▪ % increase in sales of dairy products (Leben, Babne, Cheese) (RIMS2, CI 2.1.2)	-% -%	20% 10%	30% 20%	Project M&E system	Baseline, mid term and Completion	M&E officer	▪ Commercial banks not interested in financing rural activities (R) ▪ Various dairy value chain actors are willing to participate in the programme (A) ▪ Government enforcement of quality control of imported dairy products (A)
Outputs: 2.1 technical knowledge and managerial capacities of dairy processors are improved 2.2 Improved access to finance 2.3 stakeholder platform for inclusive policy dialogue is supported.	▪ # of processors and cooperatives trained in dairy processing and marketing (RIMS2, CI 2.1.3) ▪ # of units accessing renewable energy (RIMS 2, CI 3.1.3) ▪ #of persons/households reporting using rural financial services (RIMS 2, CI 2.3.1) ▪ # of representatives of small producers and processors in platform (RIMS2, CI P2)	- - - -	300 200 1000 70	1580 500 2000 70	Project Monitoring reports	Quarterly	M&E officer	

I. Strategic context and rationale

A. Country and rural development context

Country context

1. Lebanon is a small upper middle-income open country with a population of 4.5 million people in 2015, not taking into account the approximate 1.5 million Syrian refugees and 450,000 Palestinian refugees residing in the country. Real gross domestic product (GDP) growth for 2016 was estimated at 1.8%, reflecting the impact of regional turmoil (World Bank 2016). While real GDP grew by an estimated 4.8% on average from 1993 to 2015, falling growth since 2011 and the large fiscal burden associated with Syrian refugees' access to public services and infrastructure have pushed the debt-to-GDP ratio higher (around 140% as of end-2015), resulting in a marked deterioration of the country's macroeconomic environment. Fiscally, the overall fiscal deficit widened in 2015 to reach 8.2% of GDP. The fall in revenues reflected the absence of one-off measures that boosted revenues in 2014 (e.g. payment of telecom arrears). Nonetheless, the government was able to register a primary surplus in 2015 amounting to 1.3% of GDP. On the external account, a broad contraction in imports is estimated to have induced an 8.5 pp of GDP narrowing of the current account deficit, which nevertheless remained elevated at 17.3% of GDP. Meanwhile, the growth outlook remains subdued given the ongoing conflict in Syria. The World Bank projects real growth between 2 to 2.5 yearly over the medium term (World Bank 2016).

Syrian Refugees Context

2. According to the Ministry of Social Affairs and UNHCR, the Syrian refugees are concentrated in specific pockets: 87% persons displaced from Syria and 67% deprived Lebanese live in 251 cadasters out of a total of 1,653 cadasters in the country. Nearly 95% of Syrians are food insecure, 71% are living below the minimum poverty line of USD 2.4 dollars per day and 41% have inadequate shelter. Ninety-one percent of households have an average debt of USD 857. Obtaining residency permits are becoming increasingly costly, complex and time consuming for Syrian refugees. Sixty percent of Syrians over the age of 15 do not have residency permits which restricts mobility and employment. Syrian households are characterized by high dependency ratios (97.4) and there is an inordinate number of female-headed households. For nearly every indicator of vulnerability, including food insecurity, female-headed households fared worse than their male counterparts.

3. Underemployment is widespread among refugees and the Syrian conflict has also exacerbated the labor market situation. Since the refugee influx, the labor force in Lebanon increased by as much as 35% (UNHCR, Ministry of Social Affairs, Various Situation Reports, 2016). Almost all Syrian refugees are working informally, with agriculture employing 22% of them.

4. The Syria conflict has also exacerbated the labor market situation. Since the refugee influx, the labor force in Lebanon increased by as much as 35% (UNHCR, Ministry of Social Affairs, Various Situation Reports, 2016). Almost all Syrian refugees are working informally, with agriculture employing 9.1% of them.

5. From a legal perspective, Syrian refugees are not allowed to keep livestock but it is estimated that between 200,000 to 300,000 small ruminants have entered Lebanon. On the other hand, the Ministry of Labor has allowed the Syrians refugees to work in 3 sectors after obtaining work permits, including agriculture. Syrians have historically played an important role in Lebanon's agricultural sector, both as an export market and supply of competitive farm labors. HALEPP will build on these 'pre-crisis' dynamics. Currently, the majority of the workforce on dairy farms production units in Lebanon is constituted by Syrian refugees where most of the potential for skills enhancement in flock management and mils handling lies. Thirdly, Syrian

refugees are also employed in medium and large size processing units, for the large part as unqualified workers.

6. In its efforts to cope with the Syrian crisis situation, the Ministry of Social Affairs launched the National Poverty Targeting Programme (NPTP) in 2011. The development objective of NPTP for Lebanon is to expand the coverage and enhance the social assistance package of the NPTP to Lebanese affected by the Syrian crisis and all Lebanese households under the extreme poverty line. Recently, the Lebanon Crisis Response Plan was launched in 2015 as a strategic framework to allow the Government of Lebanon (GoL) and national and international partners to come together to deliver integrated and mutually reinforcing humanitarian and stabilization interventions. Interventions in the LCRP are aligned to national policies and strategies, and seek to complement and build on other international assistance in the country. LCRP is organized along 7 strategic sectors, including one on food security; MoA, FAO and WFP lead the Food Security sector.

FARMS Facility Context

7. Like many other UN agencies and donors, IFAD joined the international community in helping the countries affected by the Syrian crisis to cope with the situation. Accordingly, and in recognising the rural dimension of the crisis, IFAD has established a Facility for Refugees, Migrants, Forced Displacement and Rural Stability, or FARMS. The goal of the facility is to ensure that poor rural people overcome poverty through remunerative, sustainable and resilient livelihoods. In host areas, livelihoods for both the host communities and the displaced peoples will be generated.

Agricultural Sector Context

8. Lebanon has a Mediterranean climate with relatively high winter rainfall (875 mm to 620 mm average from the coast to Central Beqaa). Agriculture is characterised by very small landholdings with 90% of all farms between 0.1 and 4 ha and an average farm size of less than 1.5 ha, limiting the scope for full-time employment of farmers.

9. Several technical and social challenges confront the agricultural sector, mainly: low agricultural productivity, high production cost, poor organization of farmers into cooperatives and associations, vulnerable groups prone to poverty, especially youth and women; youth unemployment. The refugees crisis has led to the breakdown of cross-border animal disease control resulting in up to 300,000 animals crossing into Lebanon, introducing several Transboundary Animal Diseases (TADs: PPR, FMD, LSD) and higher expenditures in terms of vaccination for the public Lebanese veterinary services.

10. Current agricultural development is governed by MoA Strategy for 2015 – 2019. The Strategy aims to develop institutional capacities and increase MoA preparedness to overcome challenges in the agricultural sector through partnerships and collaboration among relevant stakeholders. It defines eight courses of action: (i) improve food safety and quality of locally produced and imported products; (ii) increase productivity and competitiveness of Lebanese agricultural products; (iii) improve good governance and sustainable use of resources; (vi) strengthen agricultural extension and education; (v) strengthen agricultural research and laboratories; (vi) develop the cooperative sector and mutual funds; (vii) develop MoA capacities; and (viii) reduce impacts of climate change. The Strategy identifies targets including increasing share of agriculture to 6% of GDP from the existing 4%, reducing current agriculture trade deficit by 15% points, increasing value of agricultural production by 30% points, in addition to increasing public spending in the sector, raising farm household income and creating jobs in agriculture.

11. The need for improving the competitiveness of the smallholder dairy sector, for enhancing quality and food safety of local dairy products, and to reinforce the role of dairy cooperatives is clearly outlined in the MOA strategy.

12. Shortage of staff in government agencies, especially in the Ministry of Agriculture, is an impediment to improving the productivity of the agricultural sector. Many MoA field positions are vacant, so that existing staff are spread too thin and cannot effectively deliver services, particularly pro-poor extension.

13. **General Directorate of Cooperatives (GDC).** The GDC is responsible for the cooperative movement affairs in the country. There are 1290 registered cooperatives with around 900 inactive ones. The cooperative movement is characterized by a decrease in the percentage of farmers' enrolment into cooperatives (because of lack of motivation), as well as a decrease in the number of young members. The directorate has recently embarked upon a review process which is aiming at deregistering the non-operational cooperatives. Many cooperatives are registered with a wide range of purposes, and it is therefore difficult to know how many are focusing on the dairy sector. The staffing capacity at the GDC is very weak with an estimated vacancy rate of around 75% including support staff. This shortage in staff results in an inability to cover effectively the entire country.

14. **Directorate of Animal Resources (DAR).** DAR is placed under the authority of the Directorate General of Agriculture. It is in charge of the technical aspects related to animal production, including diseases control, imports control, extension, and regulation. Under the umbrella of the DAR there is a number of departments: Department for Animal Health (DAH), Department for Livestock Production and Breeding (DLPB), Department for Economics, Livestock Processing and Marketing (DELPM), and Department of Export and Import Control and Veterinary Quarantine (DEICVQ). Within the overall weak capacity of the MoA, the DAR seems to be better equipped than other directorates.

15. **Extension and Agricultural Education Service.** Public extension services in Lebanon are provided by the Extension Department, a subdivision of the Extension and Agricultural Education Division located within the Directorate of Studies and Coordination within the Ministry of Agriculture. The Extension Department gets its budget, usually very little, from the Ministry. However, it manages to get supplemental funding now and then from donors when they need extension support for their projects or programs. The Extension Department, suffering from the shortage of staff, usually outsources specific extension tasks to universities and non-public actors. There are significant extension work done by private vets, paravets and NGOs.

Dairy Sector Context

16. Livestock production relies on cattle (77,000 heads in total, 10,400 farms, average seven heads/holding), sheep (350,000 heads in total, 4,100 farms, 85 heads/holding) and goats (450,000 heads in total, 5,850 farms, 75 heads/ holding). Cattle are reared for milk mainly, goats for both purposes and sheep mainly for meat.

17. The **demand for local dairy products in Lebanon is high**, with a level of consumption per capita of 114 litres (FAO, 2013), comparable to other countries in the region. This high level of consumption per capita indicates that contribution of the dairy sector to nutrition is significant. . This demand has been boosted by the influx of refugees from Syria, where consumption of dairy products, especially traditionally processed, is part of consumption habits. In urban areas, consumption patterns are more oriented towards industrial processed products such as UHT milk and imported cheese, when rural areas consume more traditionally processed products. Market niches for cottage style products with high added value such as organic, fair trade or designation of origin labelled products are also emerging.

18. The **local milk production (390,000 t per year) is not in position to satisfy this high demand, both in terms of quantity and quality expectations.** The country, therefore, imports around half of its consumption (356,000 m equivalent per year). Imports amount to an annual value of USD 348 million and are composed mostly of cheese (more than half of the value of imports), as well as milk powder and butter (respectively 30% and 10% of the imports total value).

19. **Cow milk represents the largest share of milk production (95%) and goat and sheep milk represent respectively 3% and 2% of the total production.** Goat and sheep milk production are seasonal (November to June) unlike cow milk production which is permanent.

20. The installed processing capacity of the industrial sector in the country is around 160,000 t per year, but it is largely underused (60,000 tons processed per year, equivalent to 38% of capacity), mainly because of the growing competition of imported products and declining milk price on the global market. However, t**he largest part of the national production (300,000 t - 80% of the production) is marketed through the informal and semi artisanal small scale processing sector, without being directly affected by strong competition from imported powder milk used by the six Lebanese large processors.**

21. Dairy cattle production systems vary in size, with smallholder systems owning two to nine cows, medium size units with 10 to 30 animals, but also large and modern units integrated to industrial processing units. All are however quite intensified, with use of improved exotic breeds (Friesian mainly), **raised in zero grazing** with substantial level of consumption of concentrates. Forages and concentrates are usually not produced on the farm, resulting in high feeding costs.

22. Small ruminants also produce milk, even if the main purpose of small ruminants rearing remains meat. Extensive pastoral systems are dominant, but zero grazing intensive systems can also be found, especially for goats. The quantities produced by small ruminants are lower than cow milk, (around 20 000 t/year), and the production is very seasonal. It is mostly processed in semi artisanal units. Some farmers keep both dairy cattle and small ruminants, but they are not the majority (around 10-20%).

23. The dairy sector suffers from several problems, including: inadequate animal feeding, weak animal health system; small and fragmented farms; inadequate shelters, high incidence of on-farm disease resulting in antibiotic- and penicillin tainted milk which in turn results in loss of revenue, unhygienic production of household artisanal cheeses, decreasing area and productivity of pastures; low animal yields, and insufficient capacity for product, collection and processing.

Rural Poverty

24. There is no new national data on poverty in Lebanon. The most recent poverty study and the most commonly used one for a poverty profile of Lebanon, is the 2007 national report, 'Poverty, Growth and Income Distribution in Lebanon, prepared by the UNDP and Ministry of Social Affairs. This study established a lower poverty line of USD 2.40/person/day and an upper poverty line of USD 4/person/day. Using these poverty lines, 28.6% of Lebanese households were found to be poor and of these, 8% were considered extremely poor or below the lower poverty line. Currently, the Ministry of Social Affairs claims that the highest poverty count is observed in Mount Lebanon, North Lebanon and Bekaa which account for about 77% of all poor people in the country. The regions with the lowest counts of poor people are Beirut and Nabatieh.

25. **Rural Poverty**: In 2014, 12% of Lebanon's population was estimated to be rural. The rural population accounts for an estimated 20-25 per cent of the active population. Poverty is prevalent in the mainly rural provinces of Akkar, North and South Lebanon and Baalbek-Hermel. The rural poor are mainly smallholder farmers, including livestock herders, wage labourers, fishers, and women who are heads of households. **Compared to Lebanon's overall poverty rate of 8%, more than 20% of households engaged in agriculture fall below the low poverty line (Ministry of Social Affairs).**

26. **Women and Rural Poverty.** Agriculture employs 7.2% of the total workforce and 4.6% of the women's workforce while employing 10% of active men. It does not capture unpaid work. Rural women constitute 34% of the total family workforce in agriculture as unpaid labour and work a 14-hour day. Their responsibilities include planting, weeding, harvesting, food

processing, livestock rearing and selling. They produce mostly staple crops for household and small-scale cash crops. They work manually and with rudimentary equipment, collect wood for energy and nearly 40% of remote rural villages require women to fetch water. Women are hired for seasonal agricultural work during harvest time with low salaries. Similarly, Syrian refugees women headed households are significantly more vulnerable. Although less present in the labor force than their male counterpart, they are more involved in agriculture, representing almost 50% of the workforce (49%) and services (40%) while men were mostly involved in construction (37%).Women also struggle to assert rights to inherit land. Their involvement in agriculture appears to be decreasing.

B. Rationale

27. Smallholder dairy farms tend to be characterized by low productivity and poor animal health and hygiene. This can be attributed partly to ignorance of best husbandry practices, partly to deficiencies in equipment, partly to inadequate services, and partly to poor animal nutrition. Inbreeding could also be a problem for smallholder farmers who have their own bull. All these factors affect the average annual milk yield.

28. The price of fresh milk hovers around the break-even point of USD 0.70/kg for smallholder farmers with milk yields between 10 and 20 kg/cow/day, while the costs of production have been increasing (absorbing up to 70% of production cost) and milk quality deteriorating.

29. Home-based artisanal processing is common in project area where the milk is sold pasteurized, or in the form of laban, labneh, or fresh white cheese. Processing is usually done at on-farm with marginal production costs, or in small off-arm units that aggregate the milk of a handful of smallholder farmers. Processing is basic and hygiene is not always adequate, but could be easily improved with simple technologies to enhance the performance of such units, as well as the quality and safety of the products. These small scale processing units are linked to the traditional market in rural areas, but could also easily link to high added value niche markets in urban centers.

30. The IFAD Country Strategy Note for Lebanon (October 2016) identified the following two strategic objectives for IFAD short term engagement: (i) SO1: increase opportunities and improve living conditions for communities depending on dairy livestock through improved production, capacity development, access to veterinary services, and policy dialogue, and (ii) SO2: support rural enterprise development for dairy processing through SMEs and CBOs including cooperatives, producers' associations as well as private sector entities.

31. On this basis, the short-term engagement of IFAD in Lebanon includes contributions to: (i) assisting the GoL in strengthening the livestock sector; (ii) supporting rural communities hosting Syrian refugees by promoting initiatives that generate income and employment opportunities; and (iii) triggering grant resources upon request by GoL to urgently respond to the influx of refugees into the region.

32. The above mentioned priorities in the MoA strategy match the priorities of IFAD's Strategic Framework (2016-2025) as well as IFAD strategic partnership with Lebanon. Both frameworks relate to "supporting smallholder agriculture and rural development programmes, thus building the capacity, productivity and market participation of poor rural people".

33. **Theory of change**: **There is strong demand for good quality dairy products obtained through small scale processing of fresh milk**. Consumers are willing to pay a quality premium price. Currently small dairy producers are not able to penetrate this rewarding market. They not only pay a high price for animal feed but also produce and process low quality milk and dairy products (lebneh, laban and cheese). **Reducing animal feed cost and improving animal health together with higher productivity per head and adding value to good quality raw milk through hygienic processing would sustainably increase smallholder dairy producers and processors income and enhance food security at the household level and country wide.** Only then would the Lebanon dairy sector become far

more profitable at the smallholder level and lift smallholder dairy farmers and smallholder processors out of poverty. The same theory of change would apply to the Syrian refugees engaged in dairy production and on-farm processing, being it now as refugees in Lebanon or eventually upon their return to Syria.

II. Project description

A. Project area and target group

Target Groups

34. The project would target smallholder dairy farmers, on-farm and off-farm smallholder and medium dairy processors, and young unemployed Lebanese in host communities affected by the Syrian crisis and young Syrian unemployed labourers. Rural women, by virtue of their important role in dairy production and processing would be included in all project activities. The poverty profile of the target group is presented below and further detailed in Annex 2.

35. **Poor smallholder dairy cattle farmers.** These farmers can own up to 7 milking cows with the entire herd comprising around 10 heads of cattle. Household size can range from 4 to 12 members. Education levels vary but are likely to be up to intermediate or below. The project would be targeting both the vulnerable famers with 2 milking cows operating at subsistence level with marginal surplus and those with higher productive potential who have 3 to 7 milking cows but are primarily dependent on income from livestock. These farmers may be landless, owning only their house and a small area around it, they may access some land for cultivation or own a few donums. Some farmers grow fodder for their cattle but the vast majority is landless and purchases fodder.

36. **Poor smallholder semi-extensive farmers with small ruminants.** These smallholder farmers would primarily be semi-extensive farmers owning up to a herd of 200 goats and sheep. These herders may be landless or have a few donums, owned or rented, for production of some vegetables. During the annual grazing period (April to October). herders traditionally migrate setting up temporary settlements to graze their herds at higher altitudes. Local herders are sedentary, returning to their villages each night after grazing. Following the end of this grazing period, both Bedouin and local herders winter their animals in lower altitudes providing feed bought from input suppliers. Semi-extensive producers usually seek treatment for their animals in winter. The prime milking season for goats is from March to August, and sheep from March to late June. (NB: a small proportion of dairy farmers, between 10 and 20%, own both cattle and small ruminants, especially in the South, but the majority are specie specific).

37. **On-farm and off-farm small scale to medium processors.** Laban, labneh and other cheeses are produced in the rural areas at home and in small to medium processing units owned by individuals or cooperatives. Home based artisanal processing is common in rural areas. Women are the processors, primarily, but men can be involved. Milk, produced at the farm or collected from neighbours is processed using basic utensils and procedures with variable levels of hygiene. The produce is used for home consumption, sold at the farm-gate, to neighbours and local shops. The small scale to medium processing units included in the projects target group process up to five tonnes of milk per day. They employ from two to seven women and men. Some small-scale units are run by cooperatives, especially women's cooperatives, supported by donor projects through provision of equipment and training. These units may collect milk from their own farms, buy directly from other farmers or from a hallab (middleman). In addition to cow milk, they may, seasonally, process goat/sheep milk. In direct collection, there is a tendency to collect milk from farmers with larger herds of over 10 cows. Some processors do collect milk from farmers with smaller herds but may pay a lower price to defray the transportation costs.

38. **Syrian Refugees.** These households are living below the poverty line, with high dependency ratios, in inadequate shelters and experiencing high rates of unemployment. A high percentage of households are women-headed. Coping strategies include reducing health and food expenditures (relying on cheaper foods, restricting adult's consumption, missing meals etc.), selling productive assets and household goods. One of the most significant challenges that these households are facing is lack of residency permits which restricts mobility and opportunities to earn a living. HALEPP would target women and men Syrian refugees who own livestock, labourers in agriculture and unemployed youth. The small ruminant farmers would benefit from the project through participation in extension to secure their productive assets and improve profitability. Households involved in agriculture would benefit from employment generated from agro processing and marketing activities. Unemployed women and men as well as youth would benefit from short-term trainings in animal production and dairy processing and other agriculture activities.

39. **Youth.** Youth in rural areas are inevitably involved in agriculture and livestock in so far as their families are engaged in these activities and off-farm employment opportunities are limited. Only 12% of cattle farmers are under 35 years, indicating that youth are moving out of agriculture. The project would engage with youth by prioritizing them in the extension and training activities for famers, and in capacity building of small processors. The project would also train young women community-based facilitators to support home-based processors as well as 500 young Lebanese in hosting communities and Syrian willing to build their vocational skills for employment in agriculture, agro-processing and rural infrastructure.

Poverty Targeting and Gender Strategy

40. **Poverty targeting approach.** HALEPP would have a strong poverty, vulnerability and gender focus. **The project would largely focus on the Lebanese communities who are among the poorest and the most affected by the influx of Syrian refugees as well as Syrian refugees by implementing its interventions in the 251 poorest cadasters (as per Ministry of Social Affairs classification) out of a total of 1,653 cadasters in the country. The 251 cadastres are home to 67% of the most deprived Lebanese and 87% of Syrians**. The project would further sharpen its poverty focus by conducting a targeting exercise in these areas using poverty criteria in addition to the number of livestock owned to rank the target group for the different project activities, in an objective and transparent manner. The project would be implemented in a manner that would be sensitive to the constraints of rural women and youth and would encourage their participation. In some interventions, such as surveillance of animals for disease, the project would have an inclusive approach. The project would also engage with business entrepreneurs and private sector (feed suppliers, private vets, etc.) where such an engagement would promote access to markets and increased incomes or services for the smallholder farmers.

41. **Geographical targeting.** HALEPP would be national in scope and cover seven governorates in Lebanon: Mount Lebanon, North Lebanon, Akkar, Bekaa, Baalbek-Hermel, Nabatieh and South Lebanon. HALEPP would ensure a balanced and equitable approach in the distribution of intervention villages and eligible beneficiaries among the 7 Governorates. Within the governorates, the following criteria would be used to select areas of intervention: (i) area should fall in the 251 most vulnerable cadasters; (ii) high dependency of the rural poor on livestock for livelihoods; (iii) interest of smallholder farmers and municipalities in project activities; and (iv) potential for developing linkages to market.

42. **Self-selection.** The project interventions for livestock farmers would principally be attractive for small-holders of livestock who have challenges with feeding their animals, limited knowledge of animal management practices and resource constraints. Similarly, short courses in animal production or processing would only be attractive for home-based processors and mostly unemployed men, women and youth, both among Lebanese and Syrian refugees.

43. **Direct targeting.** The project would target about: (i) 2,400 smallholder cattle farmers and 1,600 small ruminant farmers (it is estimated that this would constitute nearly 30% of all farmers owning up to 10 cows and 21% of all small ruminant farmers with herds up to 200 heads; a small proportion of these farmers (10 to 20%) may own both cattle and small ruminants; in this case, they will be targeted according to their primary production, to avoid double accounting, but they will benefit from project support for both production; (ii) 1,500 smallholder on-farm processors; (iii) 80 small to medium off-farm processors; and (v) 500 young Lebanese in host communities affected by the Syrian crisis and Syrian refugees, seeking employment in agriculture and agro-processing and rural infrastructure. In all the project interventions, there would be a strong focus on women who represent a specific target for IFAD, due to their traditional relevance in livestock production, their growing social and economic responsibility, and their vulnerable position in societies. The project would aim to target up to 30% Syrian refugees while up to 50% of young trainees for job creation would be Syrians.

44. The **gender strategy** of the project would be based on lessons from IFAD funded projects effective in the inclusion of women and the experience of projects in the livestock sector regarding interventions that can increase women's productivity and incomes, enhance their decision-making and control over productive assets and lead to their empowerment. The empowerment of women would be ensured through the following strategy: (i) targets would be set for women's participation in all key activities with women and women-headed households receiving priority; (ii) the gender and targeting strategy would be reviewed yearly by the PD and partners; (iii) the terms of reference for staff and technical experts would include responsibilities for following the gender strategy of the project; (iv) the project would be sensitive to arrangements required to enable women to participate – such as organizing women only extension programmes in areas where there are restrictions on mixed gatherings, arranging training at village or municipality level to accommodate women's time constraints or providing transport allowance; (v) the monitoring and evaluation framework would include qualitative and quantitative indicators disaggregated by sex to track the project's performance in promoting women's empowerment in terms of their capacity-building and benefits; (vi) the PD would be encouraged to maintain a gender balance in staffing, with women comprising at least 30 per cent of the staff; (vii) a Gender and Community Mobilization Officer would be combined with the M&E at the PD (viii) organizations recruited for assisting in implementation of project activities would be required to have a demonstrated ability to work with women; (ix) women would be included in the annual stakeholder forums, the project would ensure the inclusion of women as livestock farmers and processors both as participants and speakers with the forum structured to ensure that they have space to voice their views and opinions; (x) any studies undertaken by the project would address gender issues and disaggregate data collection, analysis and findings by gender; and (xi) a poverty and gender specialist would be included in the yearly supervision missions, Mid-Term Review and Project Completion Mission.

B. Development objective and impact indicators

45. The overall goal of the project is to contribute to the reduction of rural poverty of resource-poor Lebanese rural households including Lebanese host communities affected by the Syrian crisis and Syrian refugees living in these areas.

46. The development objectives are (i) to increase the income of smallholder dairy producers and processors, and (ii) increase employment opportunities of young Lebanese in communities affected by the Syrian crisis and young Syrian refugees living in these communities.

C. Outcomes/Components

Outcomes

47. Five development outcomes and associated outputs are expected: (i) enhanced smallholder dairy farming productivity and supply of good quality milk; (ii) enhanced organizational capacity and enterprise skills of dairy cooperatives; (iii) expansion and improved utilization of milk collection and processing infrastructure; (iv) enhanced access to finance for smallholder dairy producers and processors; and (v) enhanced policy and institutional environment for development of the smallholder dairy industry.

Components

Component 1: enhancing competitiveness of smallholder dairy producers

48. The expected outcome of this component is to enhance smallholder dairy farming productivity and supply of quality milk; this will be achieved through outputs delivered under two activities.

    i. improving capacities of targeted smallholder dairy farmers; and

    ii. Improving animal management and productivity of cattle dairy herds and small ruminants' flocks in the project area.

Background and Rationale

49. **Dairy cattle production systems.** The Lebanese dairy herd is entirely composed of exotic animals which are raised in zero grazing intensive system. However, 3 main types of production systems can be found: (i) the most prevailing system is the smallholder system, semi-intensive, with 1 to 9 cows, producing an average of 3,750 litres per cow per lactation; in this system, cattle production is often associated with other sources of livelihoods, and marketing of milk mostly follows short and informal channels; this system is found mostly in the Northern and Southern part of the Country, and in Mount Lebanon; (ii) the medium size intensive system (10 to 40 animals) is found mostly in the Bekka and Baalbek; its productivity is high and the milk is most of the time sold to the industrial processing sector; and (iii) large industrial farms, of several hundred cows, integrated with large processing plants who wanted to secure their production and control their quality. There is very little seasonality of production, due to the feeding system which is mostly based on conserved fodder and concentrate. The smallholder system is the one where the potential for progress in terms of productivity and milk quality is the highest.

50. **Small ruminant's production systems: Small ruminant production in Lebanon is mostly focused on meat production.** Milk production from sheep and goats is much more seasonal than from dairy cattle. Although small ruminants flocks are generally mixed, sheep flocks are composed of Awassi sheep producing an average of around 72 liters of milk per year per 150-day lactation period to which about 20 kg taken by the lamb must be added and goat flocks are composed primarily of "Baladi" and Chami breeds (and their crossing), which produce 75 litres of milk per year over 180-day lactation period. There are three recognized production systems: Sedentary farming, Semi-nomadic farming, and Transhumant farming (the detailed description of these systems is presented in Annex 4).

51. **Mixed production systems.** A minority of farmers (10 to 20% in both categories) may raise both small ruminants and cattle. However, animals are kept separately and interactions between the two productions are minimal.

52. **Animal feeding.** Animal feeding is the main hinder to the competitiveness of the sector, especially for smallholder producers. The cost of feeding in dairy cattle represents 80 to 90% of the production cost, and 60 to 80% of the milk farm gate price, slightly less for small ruminants. This is mainly due to the fact that, because of the scarcity of agricultural land, most of the animal feed is imported, including part of the fodder. Dairy production in smallholder systems is based on the use of "Teben" (chopped wheat straw), which has a negligible

nutritional value, and which has to be complemented by very high quantities of concentrate feed (e.g. barley, maize, soya cake etc.) to cope with the production levels. Unbalanced feed diet directly affects rumination which cannot take place properly because of lack of "long" fibres, causing metabolic diseases, rumen chronic acidosis, low milk fat content and low fertility. Surprisingly, very good quality forages (alfalfa hay and maize silage) are available on the market, in sufficient quantities and at reasonable price considering their nutritional qualities. Their adoption by smallholders would allow a substantial decrease in the utilization of concentrates, would increase the production, reduce the production cost, and result in better production margin.

53. **Reproduction and herd/flock management.** Infertility can be very high in smallholder systems, with inter-calving intervals frequently reaching 18 months. Cows are therefore unproductive during a significant period of their life, which greatly affects the productivity, and increases the production costs. This is likely to be caused by inadequate feeding practices and excess of concentrate in the ration, but also problems of skills and capacities (lack of basic knowledge on reproduction cycle, absence of herd management tools). Milking practices are also not optimal in smallholder systems and cause milk quality issues, including mastitis, that affect processing and marketing. This aspect could be improved by adopting simple hygiene measures at the milking parlour, during handling and on-farm conservation of the milk. The Artificial Insemination sector seems to be working fairly well, on a fully private basis (semen and liquid nitrogen are available throughout the year). In small ruminants, high rate of inbreeding and milk fed to lambs/kids for the meat market have a direct impact on dairy production.

54. **Animal health.** Animal health is the second factor affecting productivity of dairy animals. For cattle, FMD[2] is the main threat; Lebanon is engaged in the progressive pathway for control of FMD established by the OIE[3] and FAO, and has reached stage 2 (out of 5 stages, the last one being the eradication of the disease). LSD[4] was absent from the country and has probably been imported with animals coming from Syria. Mastitis are of very high occurrence and negatively affect the milk quality and quantity. It is mainly due to the poor hygiene practices at the milking parlour in smallholder units. For small ruminants, PPR[5] also constitutes a permanent threat, especially in the context of uncontrolled movement at the Syrian border, because of its high mortality rate and its impact on livelihoods. The other production diseases affecting small ruminants are mostly enterotoxaemia and pasteurellosis that lead to mortality rates of lambs and kids of 25 to 40%. Vaccination is the mean of control for FMD, LSD, PPR and enterotoxaemia.

55. The control of Transboundary Animal Diseases (TADs) is under the responsibility of the National Veterinary Services. The veterinary services regularly undertake vaccination campaigns, sometimes with the support of partners (FAO supported mass blanket vaccination against FMD, LSD and PPR in 2013 and 2014). This is considered as a public good and is thus provided free of charge for farmers. Public Veterinary Services being largely understaffed, vaccination campaigns are organized using contracted private veterinarians and technicians, in the scope of a "sanitary mandate[6]" type arrangement. The main weakness in the TADs control mechanisms remains the surveillance part: there is currently no functional animal database and disease information system, no animal identification system, and capacities of the unique veterinary laboratory are limited. This is a major hinder to the effectiveness of disease control in the country.

[2] Foot and Mouth Disease.
[3] World Organization for Animal Health.
[4] Lumpy Skin Disease.
[5] Peste des Petits Ruminants (Small Ruminants' Plague).
[6] The sanitary mandate is a PPP arrangement under which public veterinary services contract to selected private veterinarians, services related to TADs control which are considered as public good.

56. **Milking.** Portable milking machines are commonly used to milk cows. Generally, farmers purchase a milking machine as soon as they have to milk three or more milking cows. In addition, most of these machines require maintenance and calibration. A well calibrated milking machine will improve cow comfort to maximize milk production. The incorrect pulsation ratio and level of vacuum, in addition to inefficient cleaning, contribute to increased cases of mastitis within the herd that farmers frequently observe (20 to 30%). This in turn affects milk yield and quality. Further to this, farmers that have two milking cows as well as small ruminant farmers (sheep and goats), hand milk their animals. In both cases, simple hygiene practices will enhance the milk quality.

57. **Anti-microbial Resistance (AMR).** Anti-microbial agents and in particular antibiotics are used inadequately and residues of anti-microbial agents are found in milk and dairy products, which affects processing, but also indubitably has an impact on public health and resistance to anti-microbial agents.

58. **Extension and capacity building of farmers.** The public agricultural extension network is composed of 31 Agricultural Centers (AC) established at sub-provincial level. These centers are placed under the authority of the Extension and Education Service/Extension Department of the MoA. Most of these centers suffer from recurrent lack of resources, in particular human resources. The number of public extension agents, especially those specialized in Livestock and dairy matters, is insufficient and does not allow the ACs to ensure a proper propagation of technical innovations and knowhow at field level, especially for smallholder farmers who are not able to pay for private extension services as it is often the case for better-off farmers. Other constraints faced by these centers include lack of logistic means, and insufficient or inadequate training and extension material. Many NGOs, on the other hand, have qualified extension staff but their collaboration with AC is not optimal. This problem of availability of extension services is exacerbated by the fact that the clear majority of smallholder farmers have not followed any technical agricultural training and their technical knowledge about dairying are mostly inherited from the family or neighbourhood. The technical capacity gap seems to be the main reason affecting animal feeding practices, reproduction and milk quality.

Objective and Strategic Approach

59. In order to improve productivity of smallholder farmers and supply and quality milk, and therefore achieve its outcome, the project will concentrate its efforts on three aspects:

    i. Reduction of production costs: the feeding system generates excessive production costs that affect the profit margin of smallholder and the health of animals; for dairy cows, it is expected that, by using adequate rations with more quality fodder and less concentrate, the production costs should decrease by 30% (Appendix 4 shows that, by using an improved ration containing alfalfa hay and corn silage, instead of a traditional ration with only teben and concentrate, the feeding cost is reduced from LBP 510 per liter of milk, to LBP 350, that is to say by 30% - other benefits on health fertility and longevity of animals are not part of this calculation).

    ii. Improvement of productivity: for dairy cattle, better feeding associated with better management of herds/flocks and reduced impact of animal diseases will result in better productivity of animals. The milk productivity per cow is expected to increase by around 25 %. Increased productivity of small ruminants will be achieved mainly through a reduced mortality in young animals through vaccination, systematic control of internal parasites and better feed management, especially during the last phase of gestation and early lactation. Milk production is expected to increase by 20% per lactation.

    iii. Milk quality: better feeding and better hygiene during milking and handling of milk will result in better milk hygiene, which will contribute to improved public health and will facilitate marketing of the milk. Improved milk quality should ultimately result in higher milk price as well.

60. To reduce production costs and improve productivity and quality of milk, the project will concentrate its efforts on two types of activities, that have a significant leverage effect:

(i) improving the technical skills of smallholder farmers, in particular regarding feeding practices, herd management, milk quality and animal health; and (ii) reducing the impact of animal diseases on dairy animals, by improving the control of the major animal diseases.

61. The combination of these two type of activities should result in a substantial reduction of production costs, increased milk productivity per animal head, and enhanced milk quality

Description of activities

A. Activity 1.1 - Improving capacities of smallholder farmers

62. **Output.** Technical knowledge and skills of smallholder dairy farmers are improved and contribute to better herd/flock management practices

63. **Extension.** The project will build capacities of dairy farmers (Lebanese and Syrian refugees), keeping cattle and/or small ruminants, through the provision of extension and advisory services. Practical training and extension on dairy production will be delivered through the 31 Agricultural Centres (AC - formally known as Agriculture Extension Centers) of the Ministry of Agriculture, to develop the capacities of smallholder dairy farmers. Training and extension services will in some cases be delivered directly by the ACs, but could also be sub-contracted to service providers, such as NGOs with experience and proven capacities in participatory extension for smallholder farmers. Sub-contracting NGOs will be preferred in particular when the AC does not have the capacities to deliver specific services, or for very specialized services.

64. The project will strengthen the capacities of the Agricultural Extension Centres, through provision of equipment and logistics (vehicles, for those that are not equipped yet, computers), capacity building (training of extension staff on participatory extension methodologies, or technical issues related to dairy production, such as animal feeding or preventive health), extension and training material (production of manuals, brochures, leaflets and posters). For those facing shortage of specialized staff, their human resources could be strengthened through recruitment of permanent or temporary staff on contract basis and thereby generate jobs for young specialists and extension agents. An assessment and mapping of ACs will be conducted during the first year of the project to get a clearer understanding of the constraints they face to fulfill their mission and identify their needs. Finally, a budget will be attributed to each Agricultural Extension Centre to apply and showcase technical innovations.

65. Extension, either by ACs or by service providers, will follow participatory methods, peer learning approaches, and be based on on-farm demonstration and trials to enable farmers to witness the impact of innovations and their feasibility. The project will bring together groups of men and women farmers to engage in an innovative process of hands-on field-based learning over a season/production cycle. The approach followed will aim at strengthening farmers' skills and knowledge for critical analysis, to test and validate new practices to make informed decisions on field management. It will also aim at enhancing group cohesion of participants to better work as a group and build the potential basis for more sustainable economic interest groups (milk collecting groups or cooperatives for instance).

66. Extension and advisory services will cover technical, managerial and financial issues. Training and extension for smallholder cattle dairy farmers and small ruminant farmers could be distinct. For cattle dairy production, training and extension will target a large range of subjects including but not limited to: (i) animal nutrition and use of quality fodder to reduce production costs (this will be the primary focus of all extension activities); (ii) milk handling and hygiene, including control of mastitis and prudent use of antibiotics to control residues and prevent anti-microbial resistance (AMR); and (iii) husbandry practices and management of reproduction cycle. For small ruminants, the issue of animal health and prevention of production diseases such as enterotoxaemia, pasteurellosis, and internal parasites, will be one of the priority

topics. The extension package will also address other subjects such as contribution of dairy products to human nutrition, household economy, and gender. During the group discussions, a specific attention will be given to discuss the benefits of producers' groups including cooperatives and the opportunities offered by the project to develop climate-smart investments. A separate extension module on forage production will be developed and administrated to both farmers who own land and wish to produce their own fodder, and farmers who don't belong to the primary target group because but wish to produce fodder on a commercial basis.

67. Smallholder dairy farmers will constitute the priority target group for extension activities. However, considering the crucial role of farm assistants in the management of dairy farms, and their skill deficit on technical issues such as animal feeding, milking hygiene or management of reproduction, they will be involved in extension activities too. Specific modalities will be established to enable farm assistants to attend group sessions and overcome reluctance of their employers to release them from work to attend for training sessions.

68. **Technical and Vocational Educational Training (TVET).** In order to build capacities of youth, local or refugees, in the dairy value chain, the project will build synergies with the project "Upgrading the Technical Agriculture Education System in Lebanon", funded by the Dutch Government and implemented by FAO. HALEPP will select in collaboration with the FAO project the participants in the training programme among HALEPP target groups, and provide support to the FAO project for the development of specialized curricula for dairy production and processing, to ensure their alignment with project priorities. The HALEPP PD will be supporting FAO project financially and technically to attain the target and impact planned under this activity.

B. Activity 1.2: Improving the animal health status of the dairy herd and flock

69. The influx of livestock (mostly small ruminants) entering Lebanon with Syrian refugees has created an additional logistic and budgetary burden on national veterinary services, for surveillance and control of animal diseases, in particular Transboundary Animal Diseases (TADs) which have the potential to rapidly spread over borders. The project will support the Veterinary services to cope with this additional burden. Specifically, the project will support the implementation of disease control programmes against three major TADs which are (i) FMD (for all ruminants); (ii) LSD (for cattle); and (iii) PPR (for small ruminants).

70. The support provided by the project will have a national coverage and will focus on 5 sub-activities:

i. Revamping the National Animal Disease Surveillance System (NADSS), an integrated surveillance system and animal health database which has been established in the past with the support of FAO but is outdated and not operational because of a lack of funding: the project will provide equipment (server and computers), facilitate the revamping and upgrading of the software and make it more user friendly, powerful, and compatible with international standards and systems[7]. The project will also support the training of users at central and regional levels on the use of the system, and facilitate the maintenance of the system and data entry through a PPP arrangement (recruitment of a private service provider for data entry), in the absence of dedicated trained staff at the Ministry;

ii. Supporting identification of dairy cattle (creation of database and ear tagging) to facilitate surveillance and traceability (identification of small ruminants is not foreseen at this stage under this project, because of its costs and implementation challenges);

iii. Providing laboratory kits for active and passive surveillance of the three targeted TADs;

[7] National Animal Disease Information and Surveillance Systems need to be compliant the World Animal Health Information System (WAHIS), managed by the OIE, in order to comply with transparency requirements of the WTO SPS agreement.

iv. Supporting logistics for surveillance, vaccination and monitoring activities: the project will purchase cars for vaccination and surveillance activities, as well as a central server and computers for the information system; and

v. Supporting PPP arrangement for disease control (vaccination and surveillance): the project will support contracting private veterinarians and para-veterinarians in the scope of formal "sanitary mandate" agreements, to cope with the problem of understaffing of public veterinary services.

71. The cost of purchasing vaccines will be supported by Ministry of Agriculture. Vaccination against TADs and identification of cattle is considered as a public good and will be provided for free. This support will be complementary with the institutional and capacity support provided in the scope of the EU funded "twinning" project, which will facilitate twinning and transfer of competences between the National Veterinary Services (VS) of an EU Member State (to be selected) and the Lebanese VS.

72. All the above systems/tools will be owned by the Animal Health Department of the MOA which by HALEPP completion would have its capacity developed to manage and maintain these systems/tools and as needed coordinate and align further technical and financial support with interested development partners.

Implementation arrangements

73. The activities under this component will be implemented through the following arrangements:

i. Training and extension services will be either delivered directly by the ACs, or sub-contracted to service providers, with experience and proven capacities in participatory extension for smallholder farmers. These service providers will be recruited through a competitive process (call for proposals), and will work under the joint supervision and control of the Extension and Education Service and of the Directorate of Animal Resources of the MoA, which will ensure quality control, coordination, and alignment and compliance with policies and regulatory frameworks. As mentioned in Appendix 5, several NGOs and AUB have been involved in extension delivery for a long period. The animal feeding component, including fodder cultivation activities, will be scientifically and technically coordinated by a mentoring organization that will be responsible for the diffusion of technical innovation and will ensure the consistency and quality of the extension package. The American University of Beirut, and ICARDA, could be contracted to play this role.

ii. Animal disease control will be implemented by the National Veterinary Services. In addition, the Veterinary Authority will subcontract private veterinarians and technicians to assist them in that task, in the scope of a "sanitary mandate" arrangement that the project would also support. Private sub-contractors will also be selected through calls for proposals.

Component 2: Improving small-scale value addition and access to market

74. The expected outcome of this component is improved nutrition through increased consumption of dairy products, better quality dairy products at the household level, strengthened and competitive small and mid-size dairy processors, and reduced post-harvest losses of milk. This will be achieved mostly through training of producers and processors in best practice. The outputs will be structured under two subcomponents.

Background and Rationale

75. The Dairy sector in Lebanon has a long tradition and history in dairy processing. Many traditional products are produced and there is an unmet demand throughout the country. The total milk produced in the country in 2014 was 391,800 tons per year (FAO statistics, 2014).

76. The demand for dairy products in Lebanon is high, with a level of consumption of 114 liters per year and per capita (FAO, 2013). The national total demand has been boosted by the influx of

refugees from Syria, where the level of consumption of dairy products, especially traditionally processed, is high.

77. In the country there are 276 dairy processing plants with different capacities (Table 1, in Appendix 4). However, most of the produced milk is processed through the semi artisanal small scale processing sector (Lebanese Dairy Board, 2016).

78. In spite of the support and services provided by past dairy improvement programs and projects that include those of the FAO, IFAD, USAID, EU and others, processors are still confronted with challenges associated with the quality of milk and its hygiene.

79. **Milk collection**, handling and transportation often lack adherence to basic hygienic rules. Milk is cooled when it arrives at the processing units, but as far as smallholder are concerned, not on-farm or during transportation. Several small ruminant farmers and a large proportion of small-scale dairy cattle producers, especially in remote areas, process directly their milk into yogurt and yogurt-based derivatives.

80. The main constraint faced by farmers are the low milk prices that vary from LBP 500 to 850 per kg and a few farmers achieve LBP 1,100 per kg. No price difference exists between small ruminant and cow milk. In a few cases small ruminant milk is sold for LBP 1,100 or more. However, milk prices are very much affected by the prices of imported milk powder which add an additional pressure on producers to reduce their milk prices.

81. **Dairy processing** is one of the most important activities practiced in Lebanon. The main products include Laban, Labneh, Shanklish, and different types of local cheese such as Baladi, Akkawi and Halloum cheese. The obtained yields in processing varies depending of the type of cheese (see Table 4 in Appendix 4). Moreover, prices at the processors gate varies from place to place and also depends on reputation of the processors or producer. A list of price variation is presented in Table 4 of Appendix 4.

82. Dairy processors are facing the problem of milk quality which affects the quality of the end product and its characteristics. Inadequate hygiene procedures at milking and during transportation are the inherent causes. The majority of household producers and small dairy processors do not produce cheeses due to marketing opportunities or in some cases due to knowledge gaps. On the other hand, mid-size producers are processing Baladi cheese to respond to increased demand and to overcome the problem of antibiotic residues in yogurt processing. Moreover, some cheeses are marketed without any adequate thermal treatment exposing consumers to infectious and zoonotic diseases like Brucellosis. Many dairy units need to improve their hygienic procedures and infrastructures to comply with basic prerequisite standards. Additionally, many small processing units are operating without a license or/and without obtaining health certificate.

83. **Quality control of milk and dairy products.** The current lack of quality control of raw milk and dairy products at small and mid-size dairy processing unit is a major impediment to growth of Lebanese dairy sector. There is a need to promote and regulate a marketing and pricing system for quality milk that is based on fat content, physical attributes, bacteriological and antibiotic residue analyses.

84. **Marketing.** Constraints on market access, such as weak infrastructure, lack of rural trade networks and absence of market information, result in low prices and consumption-oriented production. Links between producers, processors/traders will ensure continuous market access, value addition and optimum prices.

85. **The knowhow and capacity building.** Producers and processors have adequate knowledge in processing traditional dairy products. However, small producers and laborers in this sector did not receive technical training on processing and they are not sufficiently exposed to information on hygiene. The poor knowledge, technical issues and the lack of the basic hygiene procedures in processing affect the product quality and quantity. Establishing different

training modules including training of trainers (ToT) on hygienic milk handling and processing is essential to supply the market with high quality and safe products.

Objective and strategic approach

86. The overall objective would be to increase the income of household producers and dairy small scale and mid-size processors by improving on-farm and off-farm processing productivity, increasing value addition, enhancing product quality and facilitating access to market.

87. **On processing**, the project will focus on improving hygiene procedures in milk handling and processing, reducing losses through the value chain particularly during processing, enhancing the dairy processing yield through better controlled processing environment, which will result in better performance of the processing stage. The project will also support access to processing and quality control equipment.

88. **On market access.** Taking into consideration the dairy industry characteristics and the potential of the small and medium processors, several marketing options were assessed by the design team. Market penetration where there is a strong competition from large industrial processors and imported products will not be considered feasible given the limited financial and managerial capacities and bargaining power of the small and medium processors. Consequently, the most suitable marketing strategy is to focus on a parallel market through a combination of the following options:

    (i) targeting local markets close to the production and processing sites where fresh bulk milk and traditional dairy products are most preferred by the local consumers; and

    (ii) targeting the emerging urban niche markets for upmarket authentic and natural products through adaptation of small and medium processors products to better quality, safety, competitive prices and eventually creation of a quality label. The primary focus will be on products that are the most familiar to consumers, such as laban, labneh, kishk. It would be followed at a later stage by the promotion of new products, which may offer better possibilities for fast growth.

89. The proposed marketing strategy would require aggregating the dairy products of smallholder producers and processors to access and compete in markets at significant economy scale. Experience in other countries (Turkey, Tunisia, Morocco, etc.) clearly indicates that the cooperatives would be the most appropriate mode of product aggregation. Solid and well managed cooperatives would allow their smallholder producers and processors to diversify into value addition and convert raw milk into processed dairy products. Despite such high potential, the cooperatives in Lebanon are not in a strong position to service their members. In addition to their weak financial situation, their staff and board members lack managerial skills and interaction between the management and the members. The project will therefore improve the functionality of selected cooperatives through support at various level: improved governance, enhanced management systems, and strengthening of capacities of members, staff and management.

90. **Output.** The knowledge and awareness on hygiene of smallholder producers are improved; the technical skills of processors are improved, quality control and hygiene practices are enhanced; capacities of cooperatives for aggregation and access to market are enhanced.

Description of activities

2. Sub-component 2.1: Supporting aggregation and value addition

Activity 2.1: Improve capacities for on farm dairy processing

91. A training programme will be designed to increase awareness on milk hygiene, handling and processing focusing on women household members in charge of milking animals and milk

processing at home. The focus will be on the introduction and use of simple innovations and technologies that results in higher yield and improved quality products.

92. The project will target 1,500 cattle and small ruminant household producers over the project life span where 60% of the beneficiary will be women and 40% men. These household producers will be identified through the preliminary targeting exercise.

93. The project will focus in the first year on preparations and developing of training modules. The training modules will make use of available material that includes what was developed by other organizations in the country and in the region on the same topic. Training material will include guidelines to help on farm processors to comply with existing regulations related to hygiene, milk quality and safety. In addition, training of trainers (ToT) will be conducted in the first year to produce 10 qualified trainers in milk processing Out of these 10 trainers, at least four should be women. In addition to the initial off site training programme, an on the job coaching and mentoring programme will be implemented. The trainers will visit the trainees twice a year in average to support the application of the newly acquired skills and provide technical backup.

94. **Quality Enhancement.** In complement to capacity building support, the project would provide the smallholders producers with 2 milk cans per household to handle milk in a hygienic way and to maintain the quality, and intensive training on milking and milk handling and processing. For those processing high value products, small scale processing equipment (small cooling facilities - cheese presses- vacuum packagers, etc.) will be allocated in order to improve quality of final products and enhance value addition. Equipment cost would be covered on a project/beneficiaries 80/20% sharing basis.

Activity 2.2: Improve capacities for off-farm dairy Processing

95. The project will target 80 processors where 40 have a daily capacity of up 200 liters, the other 40 targeted processing units will have a daily capacity of up to 2,000 liters. The focus will be on quality control, and improved processing methods and product labelling. Packaging and branding will help producers to better access markets and capture the additional added value.

96. **Training.** A training programme and on-demand assistance and advisory mechanism will be set to cover aspects needed by producers to fulfil consumer demand. Market information, network and market oriented processing will secure small and medium size processors and producers income and open opportunities to expand and upgrade dairy businesses.

97. In the first year of the project implementation, a training module will be developed and publications such as booklets and fact sheets will be produced. Training material will include guidelines to help on farm processors to comply with existing regulations related to hygiene, milk quality and safety. In addition, the required materials to successfully organize trainings will be purchased.

98. The training module will cover different areas that include milk composition, microbiology and quality control. The project will conduct eight training sessions in the second year each session will be attended by maximum of 10 beneficiaries. A further training module will be provided to successful dairy processors in the 4^{th} year. This training will focus on dairy product diversification. The training will provide processors with additional options to increase their income through targeting marketing niches. A follow up program will be developed to and income. Four follow up visits per processing unit per year will be carried out and documented.

99. In addition to the initial off site training programme, an on the job coaching and mentoring programme will be implemented. The trainers will visit the trainees four times a year in average to support the application of the newly acquired skills, ensure that processors are in the right track to improve their products and provide technical backup.

100. **Quality Enhancement.** In addressing the gap of milk quality control, HALEPP will provide support to implement a simple milk quality control system. Small size dairy processors will be

trained and equipped to check milk for acidity, and EC to detect mastitis milk. In addition, the mid-size dairy processors will receive additional training and equipment to analyze milk component including adding water. Both types of processors will be able to detect antibiotic residues in milk that affect product quality and human health.

101. The project will provide different kits to control the quality of received milk. The first kit will consist of a thermometer, a portable combined pH/EC meter and a set of dairy cultures to produce yogurt and cheese. This kit will be provided processing units with a daily capacity of up to 500 liters. The second kit, for bigger units, will consist of a simple milk analyzer, a portable combined pH/EC meter, a thermometer and a set of dairy cultures for the production of yogurt, yogurt based products and different types of cheese.

Activity 2.3: Supporting access to market

102. **Development of a quality label for Lebanese cottage dairy products.** The project would contribute to enhancing market access for high value quality traditional dairy products, targeting the emerging and fast growing market niche for authentic and natural Lebanese dairy products. Lebanon has an important know-how in the manufacturing of typical national dairy products which are part of the national cultural heritage. These products even benefit from a strong consumers' recognition but do not have an official quality label framework which protects them from industrial or imported products, and guarantees their "quality" and "safety". The project will therefore support the development of a quality consensus-based label for cottage dairy products, which could eventually lead to the establishment of a "Controlled Designation of Origin" framework. This framework will in particular include the specifications for production of milk, its processing, packaging and marketing. Theses specifications will be established in consultation by all the actors that would be interested in producing the labelled range of products. This process could be initiated under the stakeholders' platform (supported by HALEPP), under the authority of which an inclusive quality label "working group" could be created to lead the process. Project funds will be allocated for (i) developing draft specifications; (ii) facilitating the consultation process among value chain actors (operations of the working group); and (iii) promotion of the quality label and related products and awareness on nutritional benefits of dairy products consumption.

103. **Support product aggregation through improved functionality of cooperatives.** As mentioned earlier in the PDR, only one third of the existing 1,290 cooperatives are functional. Following the base line survey in year one, the project would select around 50 of the most genuine and member-driven dairy cooperatives to provide them with necessary capacity building at three levels: (i) at members' level, to enhance capacity of members to exercise effective checks and balances over the governance of their cooperative; (ii) at management level, to enable cooperative managers to combine the skills of an effective business manager with those of an efficient service provider; and (iii) at employees' level, to make cooperative staff technically capable but also more proactive to better respond to the requirements of the market and the needs of the members. The training curricula will cover various aspects including governance of cooperatives, management including financial management, commercial aspects and marketing. In addition to capacity building, and in order to promote processing and marketing of high value dairy products, project support would include a study on "Dairy Products Diversification and Marketing" to be carried out by a marketing specialist in year one of project implementation. The study would identify the most efficient way of enhancing smallholder's producers and processors access to market. The study would focus among other things on products and sales promotion, supply management and distribution networks.

Activity 2.4: Renewable Energy (RE)

104. In order to assist the target group in reducing energy cost and to explore opportunities for RE private sector's engagement, the project will support, on a pilot basis for later scaling up, three models using renewable energy in the dairy sector.[8]

i. **On-farm milk cooling technology using solar energy.** Cooling milk on farm to maintain the original quality after milking is the method of choice for ensuring good-quality milk for processing and consumption. At present, cooling equipment is expensive for smallholder producers, unavailability and/or unreliable electric power supply are factor deterring on-farm cooling. The recent progress and reduction of costs of the photovoltaic technology offers the possibility to develop affordable equipment which would guarantee a constant supply of energy.

ii. **Solar energy water heating for milk processing.** The excessive cost of electricity for heating water for dairy processing and the frequent electric power cuts affects the profitability and efficiency of small dairy processing units. By piloting solar panel units to heat water for processing, the project intends to demonstrate the economic benefits in a country characterized by a climate with high levels of solar radiation.

iii. **Biogas production from dairy cattle dung.** The lack of management of excreta (dung and urine) from dairy cattle farms causes severe environmental problems and, in the context of rapid urbanization, complains by the residents near the farms. The objective is to introduce smallholder dairy farmers to a system of collection of manure, capture of Methane for combustion purposes (e.g. on-farm pasteurization, yoghurt production, on-farm cheese processing etc.) and utilization of "bio slurry" for agricultural purposes (i.e. vegetable, fruit and plant production). It will build on IFAD experience with the "portable biogas" technology. Eventually, biogas for milk cooling purpose would be tested as a standalone technology or in association with solar energy.

Implementation Arrangements

105. **Training for on farm and off farm processing, and training of cooperatives.** The trainings and on the job coaching for on farm and off farm processing, as well as the training of cooperatives and marketing support will be conducted by local NGOs or other institutions that have the capacity and knowledge, and proven records in similar activities, and which will be recruited through calls for proposals (a list of potential service providers is presented in Appendix 5).

106. **Development of a quality label for Lebanese cottage dairy products** will be implemented by a dedicated committee established under the dairy stakeholder platform, supported by a specialized service provider/NGOs (e.g. Rural Delights, who has a good experience in this domain, Food Heritage) and working under the guidance of the Platform and the Directorate of Animal Resources.

107. **The renewable energy pilot activities** will be implemented by institutions with appropriate expertise, such as universities or research organizations, renewable energy centres (such as the Lebanese Centre for Energy Conservation) and private suppliers, selected through call for proposals to select the best qualified and cost effective service provider.

Sub-component 2.2: Improving access to finance

108. Financial institutions (FIs) in Lebanon –commercial banks and microfinance institutions - are generally well-managed, have extensive geographic footprints, enviable operational performance, and ample capital for on lending. Most agricultural lending (estimated at 10% of

[8] http://www.fao.org/docrep/003/X6541E/X6541E00.htm#TOC

all FI loan portfolios) targets large agro-industry. This said, the smallholder market, particularly in the dairy sector, with its constant revenue, represents a good market for FIs. They face several constraints to lending, however, including: poor understanding of the dairy sector, inappropriate products, high transactions costs, and inaccurate risk analysis resulting high interest rates. For smallholders, constraints include poor knowledge of credit, fear of banks, preference for grants, and, for some, religious objection to interest.

Outcomes and Objectives

109. Subcomponent outcomes are to increase formal financial sector lending in the smallholder dairy sector. The objective of this subcomponent is to demonstrate the viability of sustainable inclusive finance in the rural smallholder dairy market.

Description of Activities

110. To stimulate lending in the dairy sector, the project will work with FIs and dairy smallholders and medium stakeholders to develop interest in dairy loan product/lending. A financial product will be developed and tested by three to five FIs selected on a competitive basis with technical support from the project. In association with the extension activities, smallholder dairy producers will be supported with the basic business management skills required for loan applications and credit repayment. Similar support will be provided to small dairy processors. The project will also fund the assessment of inclusive (pro-poor) financial services in rural areas, as well as a study on innovative approaches to micro-insurance for rural areas. Both of these studies should be sponsored by a national organization, with strong vested interest in the development of inclusive finance, excellent technical capacity in good practice inclusive finance, and able to ensure broad sector representation, wide distribution of/dialog around the studies (e.g. the LMA).

111. HALEPP would support the following:

i. The creation of loan products directed at cow and goat/sheep milk production among project beneficiaries, specifically, and the sector more broadly. Technical assistance would be provided by the project to selected FIs to create dairy loan product(s) of their own or in association with other financial institutions. For the new loan product or testing, HALEPP will provide a modest amount of funding, while each FI will match with their own capital on a negotiated basis (e.g. 60:40);
ii. Provision of basic farm enterprise training and support for loan application processing (for beneficiaries interested in taking a loan);
iii. A study on the assessment of rural finance in Lebanon through an extensive analysis of both the supply and demand of finance in rural area generally, and through an extended case study of the dairy value chain, specifically; and
iv. A study on market analysis for the potential of micro insurance in rural areas, with a case study focus on insurance products for dairy value change smallholder households and processors.

Implementation Arrangements

112. IFAD experience recommends the most effective and efficient means to manage appropriate sourcing, contracting, oversight/monitoring and evaluation capacity is to contract an independent third party. The third party would have the following characteristics: (i) strong technical capacities in inclusive rural finance; (ii) legitimacy within the inclusive financial sector to convene broad stakeholder group; and (iii) have a long-term interest in the development of the inclusive financial sector (e.g. the LMA). Project activities would be implemented through call for proposals.

Sub-component 2.3: Supporting a dairy stakeholder platform for inclusive policy dialogue

Background and rationale

113. There is a need for more inter-stakeholder dialogue in the dairy sector, in particular to address issues of price equity along the value chain, milk quality, as well as regulatory and policy aspects. The industrial processing sector is the only category of stakeholders to be organized at national level in the Lebanese Dairy Board[9]. Other categories such as smallholder producers or small scale processors are not organized, their lobbying and advocacy capacities are very weak, and their voice can hence hardly be heard at decision makers' level. The Ministry of Agriculture has recently initiated a more inclusive process, called "National Milk Committee" convening stakeholders' fora to discuss various issues concerning the dairy sector, including milk price, milk quality and prevention of anti-microbial resistance through prudent use of anti-microbial agents, animal feeding, etc. The project will further support and consolidate this MoA's initiative ensuring a regular frequency in the organization of these fora, and facilitating smallholder farmers and small scale processors participation.

Outcomes

114. This activity will have three main outcomes: (i) an inclusive national policy dialogue platform is established/strengthened and plays an active advocacy role for the interest of the smallholder dairy sector; (ii) 7 regional innovations platforms are established, address technical constraints at local level and ensure upward flow of information; (iii) consensus based self-regulation mechanisms (for quality, price…) are established.

Description of the Activity

115. At national level, the Directorate of Animal Resources (DAR) will lead and coordinate the activities of the dairy stakeholder platform which will gather on a regular basis. Participants to the platform will be: (i) milk producers, including smallholders; (ii) milk processors, including small scale processors; (iii) milk traders, including "Hallab", importers, exporters; (iii) service and input providers (AI, feed, breeding stock traders); (iv) public authorities: Ministry of Agriculture, Ministry of trade, and other public entities on ad-hoc basis depending on the agenda; (v) research organizations; and (vi) any other value chain actor whose presence could be needed according to the agenda. The main issues addressed by the platform could be (i) quality issues and how to establish a quality payment system; (ii) feeding systems and incentives for production of fodder; (iii) price negotiation and regulation, with the aim of having a fairer price mechanism that benefits better to smallholders; and (iv) participation in policy processes. Studies would be commissioned to provide qualified background for evidence-based dialogue, for instance on the impact on imports of the milk sector, on milk quality issues, and on the feed and fodder value chain. HALEPP M&E system will also consider indicators for measuring the outputs, outcomes and impacts of this policy dialogue.

116. Regional platforms will also be established in the 7 governorates. They will focus more on technical issues and act as problem-solving mechanisms and technical innovation platforms; they will also ensure the upward flow of information to the National level.

117. The project will facilitate meetings and transport of participants from the regions. It will ensure that smallholder farmers, and small-scale processing groups, are adequately represented in the platform. To that effect, participants to the National platform will be selected among participants in the regional ones who are the most active. Participants to the regional platforms will be selected among farmers benefiting from extension and advisory services. The project will also support coordination and dialogue between smallholder farmers' groups,

[9] The Lebanese Dairy Board is a non-profit organization and is composed of 6 dairies: TaanayelLes Fermes/Bonjus, Dairy Khoury, Liban Lait, Dairy Day, Dainka Dairy, and Jdita. It is in the process of changing its name to reflect its real composition and role, which are not those of a board.

which could result in the creation of a National body (or several regional ones) representing smallholder farmers.

D. Lessons learned and adherence to IFAD and FARMS policies

118. IFAD is currently supporting Lebanon through two projects:

(i) the "Hilly Areas Sustainable Agricultural Development" project (HASAD) focused on water management; and

(ii) the "Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon" (AgriCAL) which has yet to start.

119. The first agricultural project in Lebanon was the "Smallholder Livestock Rehabilitation Project" (SLRP; 1994-2003). The project came right at the end of the civil war with the aim of quickly assisting the rural poor to rebuild their livestock stock and engage in profitable farming. Its components included restocking herds, livestock services (AI and vaccinations), establishing cooperatives, rural credit, and milk marketing. The restocking was intended to help producers recover from herd losses during Lebanon's civil conflict. As is the case with externally financed projects in Lebanon, the SLRDP did not reach its intended objectives for lack of in-country capacity, political interference and elite capture and top down approach. A project shortcoming was the construction and management of milk collection centres without proper link to the needs of small producers.

120. Outside IFAD portfolio, two ongoing projects in the dairy sector (implemented respectively by FAO and Mercy Corps) provide support to small scale women cooperatives involved in dairy processing.

121. **The main lesson to be learned** from projects supported by IFAD and others regarding smallholders dairy value chain could be summarised as follows:

122. **The cooperatives could play an important role but they are not a panacea for the development of smallholder dairy sector.** There are currently 1,290 registered cooperatives in the country, but 20% are thought to be active, according to the Directorate of Cooperatives. This Directorate has embarked in a cleaning exercise whereby cooperatives will be required to prove their operational capacity, or will be de-registered. Obtaining and maintaining the cooperative status implies a number of obligations, with its related costs, that seem to put a burden on small groups. Working in groups also doesn't seem to be traditional in Lebanon, except in the scope of the family or neighborhood. The cooperative status offers some advantages like for instance income tax exemption, and is often a condition to access to grants and loans. However, the project could explore some alternative group models like associations or informal groupings when the cooperative status doesn't' seem adequate or in the earlier phases of group dynamic.

123. **Role of NGOs in facilitation of market access.** Successful arrangements between NGOs and groups of smallholder dairy farmers and processors, can be found in Lebanon. NGOs like Rural Delights and Rene Mouwadh Foundation have been quite active in this domain.

124. **Role of Milk collectors.** The formal dairy value chain (where milk is bought by medium and large scale processors) is characterized by the central role played by milk collectors. This model is mostly practiced in Bekaa area, where very limited commercial transaction takes place directly between a large processing factory and a farmer, or a group of farmers (including a cooperative) without this intermediary. This intermediary could be family related to the processor in some cases. In some situation, the intermediary ensures cooling and/or transportation of milk. In this case, his services are paid an average of LBP 200 per litre. In some cases, he doesn't ensure any technical function, except "forwarding the invoice" but is still paid LBP 50 per liter. This is high in comparison with the benefit obtained by the producer, which ranges from LBP 100 to 200 per liter, because of the very high production costs and feeding charges in particular.

125. **Monitoring and Evaluation.** Like many IFAD and other donors supported projects, the M&E system is always weak. The lack of data available to measure the impact of the project was underlined in the completion review undertaken by IFAD for SLRP, IRMP and AIDP. In particular, the lack of quantitative data on agricultural productivity, water use efficiency, input use, as well as adoption rates, was underlined. This is largely due to weak M&E system. A common recommendation from these project evaluations is that a strong M&E unit should be established from the beginning of the project, not only to look at the physical and financial aspects of the project, but also to follow-up on its sustainability and impact in terms of poverty reduction. Good baseline data and an early implementation of an effective monitoring system, backed by implementation support, are essential.

126. **Project management.** The most recent ongoing project, HASAD, has encountered recurrent problems. After four years of implementation, tangible outcomes delivered to the target group are limited. Many factors could explain this including a highly unstable political context, limited human resources in public administration, highly bureaucratic procedures, weak M&E system as well as elite capture for rural infrastructure. A Project Directorate (PD) attached to a Government body (e.g. MoA) managed by specialists recruited on a competitive and transparent basis, and relying on service providers (through calls for proposal), is best placed to implement projects.

Project Adherence to IFAD Policies

127. As clearly detailed in Annex 12, the project is in line with IFAD Strategic Framework 2016-2025, NEN Country Strategic Note for Lebanon and following IFAD policies. The project activities, implementation arrangements and M&E system have been designed in compliance with IFAD Targeting Policy, IFAD policy on gender equality and women's empowerment and in line with the approaches outlined in the Framework for Gender Mainstreaming in IFAD investment Operations. The project is designed to be consistent with IFAD's Private Sector Development and Partnership Strategy, its Rural Finance Policy and the associated Decision Tools for Rural Finance. SECAP report confirmed the classification of Environmental and Social category as **B**, and climate risk classification as "Moderate", considering that the project approach will promote use of climate resilient technologies (e.g. solar energy and biogas technologies), and improved management of animal raising and dairy processing. Last but not least, HALEPP is fully aligned to FARMS policy, as indicated below.

Project Adherence to FARMS policy

FARMS Facility Context

128. The current global crisis of forced displacement is unprecedented in recent decades and the worst since World War II. It currently affects over 60 million people worldwide, and a total population of concern in the Near East and North Africa region around 22.2 million people. The crisis most acutely affects communities in Syria, Yemen, Iraq and their neighbouring countries. As a contribution to the donor's community efforts to help these countries cope with the crisis, and in recognition of the rural dimensions of the crisis, IFAD has established a Facility for Refugees, Migrants, Forced Displacement and Rural Stability, or FARMS. FARMS priority countries will be Djibouti, Egypt, Iraq, Jordan, Lebanon, Morocco, Somalia, Sudan, Tunisia, Turkey and Yemen.

129. The key outcomes to be delivered by FARMS in these countries include: (i) improved productive rural infrastructure through implementation of at least 500 rural community infrastructure projects; (ii) creation of at least 500,000 days of temporary work and at least 20,000 employment opportunities, primarily for youth; (iii) increased social resilience through building community-level and local government capacity; and (iv) improved governance and management of natural resources.

HALEPP Alignment with FARMS policy

130. As mentioned earlier, 67% of the most deprived Lebanese and 87% of Syrians live in the same vulnerable areas covered by HALEPP. FARMS co-financing of HALEPP project is a good opportunity to help the two communities co-exist in harmony and less friction which is due to the limited resources at their disposal. In particular, HALEPP through capacity building and training would put at the disposal of Lebanese farmers and processors a pool of qualified Syrian workers for on-farm and off-farm employment in areas much less attractive to the young Lebanese. FARMS and HALEPP are aligned in terms of geographical coverage, overall goals, development objectives, outcomes, and financing plan.

131. **Geographical coverage.** The Syrian refugee's crisis has a clear rural dimension for several reasons: (i) Syrians are largely found in rural areas as the cost of living is much lower than in urban areas, (ii) agriculture is a good source of employment for the Syrian at working age, and (iii) some Syrian households brought with them their animals when they migrated to Lebanon. They kept engaging in dairy production and processing for self-consumption and as a source of income. HALEPP project would focus on the Lebanese communities who are among the poorest and the most affected by the influx of Syrian refugees as well as Syrian refugees by implementing its interventions in the 251 poorest cadastres in the country. The 251 cadastres are home to 67% of the most deprived Lebanese and 87% of Syrians refugees. These two groups are the focus of FARMS targeting and coverage as clearly indicated in FARMS design document. The same document stipulates that identification of target communities will be done in collaboration with national partners, utilising national databases, as well as those of partners such as UNHCR and IOM. The above mentioned 251 cadastres have been selected on the basis of information available at the Ministry of Social Affairs and UNHCR Beirut. The poverty level and eligibility of these groups were validated by the design mission through visits and meetings with potential target group.

132. **Overall goal.** The overall goal of HALEPP project is to contribute to the improvement of the livelihood of resource-poor rural households, including Lebanese host communities affected by the Syrian crisis and Syrian refugees living in the same areas. This goal is fully aligned with FARMS overall goal of ensuring that poor rural people in host areas overcome poverty through remunerative, sustainable and resilient livelihoods. In host areas, livelihoods for both the host communities and the displaced peoples will be generated.

133. **Development Objectives.** HALEPP development objectives are (i) to increase the income of small dairy producers and processors and competitiveness and resilience of the dairy sector for the provision of quality dairy products; and (ii) increase employment opportunities of young Lebanese in communities affected by the Syrian crisis and young Syrian refugees living in these. The two objectives are aligned with FARMS specific objectives as follows: (i) Smallholder dairy producers and processors are part of the broader FARMS definition of host communities, specified in FARMS first specific objective. The latter states that Host communities are resilient to the impacts of large inflows of refugees, minimising negative impacts, and maximising positive impacts for host communities and for refugees, through food security support, enhanced rural infrastructure and increased livelihood opportunities; and (ii) Syrian smallholder dairy producers/ processors and unemployed youth are part of FARMS target group, being the refugee households and people to be provided remunerative opportunities and skills to integrate in host areas and facilitate return to home country.

134. **FARMS Outcomes.** HALEPP would be contributing to at least four out of the five FARMS outcomes, as follows:

135. **FARMS Outcome 1.** Improved rural infrastructure in target communities

i. Critical basic infrastructure required for irrigation, domestic water, energy and sanitation. HALEPP would promote renewable energy through provision of on farm milk cooling technology using photovoltaic panels and water heating with solar panels for milk processing, and Biogas production from dairy cattle dung for cooking purposes.

ii. Infrastructure required to prevention contamination of livestock and irrigation water sources. The influx of livestock (mostly small ruminants) entering Lebanon with Syrian refugees has created an additional logistic and budgetary burden on national veterinary services, for surveillance and control of animal diseases, in particular Transboundary Animal Diseases (TADs) which have the potential to rapidly spread over borders. The project will support the Veterinary services to cope with this additional burden. Specifically, the project will support the implementation of disease control programmes against three TADs which are (i) FMD (for all ruminants), (ii) LSD (for cattle), and (iii) PPR (for small ruminants). The support provided by HALEPP will focus on 5 sub-activities: (i) revamping the National Animal Disease Information System, (ii) supporting identification of dairy cattle (creation of database and ear tagging) to facilitate surveillance and traceability); (iii) providing laboratory kits for surveillance of the three targeted TADs; Supporting logistics for surveillance, vaccination and monitoring activities: the project will purchase cars for vaccination and surveillance activities, as well as a central server and computers for the information system; (iv) supporting logistics for surveillance, vaccination and monitoring activities, and (v) supporting PPP arrangement for disease control (vaccination and surveillance.

136. **FARMS Outcome 2.** Increased availability of temporary and permanent employment opportunities in target communities

i. Small matching grant schemes to support start-up of microbusinesses: HALEPP would provide small grants to the micro and small processors to engage in dairy processing. The beneficiaries would be required to contribute 20% of the cost of processing and quality control equipment.

ii. Ensuring adequate access to financial and non-financial services, markets, and training, i agricultural extension and reliable remittances and related products. HALEPP would provide support to the potential bank clients through capacity building and training on business plan preparation. Extension services would be provided through Agriculture Centres directly or by NGOs under call for proposals arrangements. Training of young Lebanese and Syrian refugees would assist them job seeking. While there are currently significant humanitarian efforts to address the subsistence needs of the refugees in addition to the Lebanese Crisis Response Plan 2015-2016 (LCRP) which address Lebanese host community needs, both need to be scaled up substantially. Therefore, and in the same context, HALEPP would, through investment in vocational training and skills improvement, contribute to addressing the livelihoods and employment needs of Syrian refugees and Lebanese host communities alike.

137. **FARMS Outcome 3.** Increased social resilience and capacity to manage development interventions, resolve conflicts, and address the needs of displaced persons, migrants and other vulnerable groups

i. Strengthening community-based organisations, local government bodies, and civil society organisations working in and with affected communities. HALEPP would be supporting functional cooperatives and informal groups willing to engage in small and medium dairy processing.

ii. Technical assistance, training and workshops to build the capacities of national partners, implementing agencies and equip migrants with skills they will need when they return. The project would facilitate the development of a new software for animal disease control compatible with international standards and, train users at central and regional levels on the use of the system. HALEPP would also invest in capacity building of financial partners willing to lend to the target group.

138. **FARMS Outcome 5.** Enabling policy and regulatory frameworks at national levels

i. Establish effective M&E systems, producing reliable data and analysis, with strong and fast flowing feedback loops to ensure emerging lessons are fed quickly back into planning and implementation processes. HALEPP M&E system is designed to offer

comprehensive and reliable information to improve planning and decision-making for results-based management.

ii. Developing policy briefs and engaging in national and international fora. HALEPP would support a dairy stakeholder platform for inclusive policy dialogue, a study on the assessment of inclusive (pro-poor) financial services in rural areas, and a study on innovative approaches to micro-insurance. The studies would provide qualified background for evidence-based dialogue on, for instance, the impact on imports of milk powder on the dairy sector, quality issues, and rural finance policy.

iii. Establishing partnerships with international and regional agencies addressing the refugee crisis, including in the delivery of outcomes. FARMS design document calls for strong coordination with the Rome Based Agencies (WFP and FAO). Since 2015, FAO/WFP and MoA/MoSA are co-leading the Food Security Sector Working Group (FSSWG). HALEPP would be coordinated with initiatives under FAO and WFP implementation, including vocational education and training project (FAO) and WFP sponsored food programme (voucher system for the purchase of food items, including milk and dairy products). In addition, HALEPP would coordinate investment activities with the UNHCR within the host communities. Working alongside the government of Lebanon, notably the High Relief Commission, the Ministry of Social Affairs and municipalities, UNHCR has worked to ensure a consolidated and coordinated inter-agency response, engaging fellow UN agencies and local and international non-governmental partners. UNHCR teams in the north and the Bekaa, with support from the Beirut Office, work with over 30 partner staff on the ground to receive refugees, assess needs, and meet protection, food, shelter, education, health and psycho-social needs. The coordinated response is one that also seeks to support host families and communities who have opened their doors to refugees since the beginning of the influx.

139. **Co-financing.** FARMS design document clearly indicates that about 75% of the funds of the Facility will be allocated as co-financing for IFAD's ongoing and pipeline investment projects. HALEPP co-financing plan presented in the detailed cost tables and summarised below, shows the way FARMS financing is embedded in HALEPP project at the level of the three components. Project activities related to dairy production, animal health improvement, dairy processing, and training on skills improvement for employment, are the focus of FARMS and IFAD financed activities.

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Components by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
1. enhancing competitiveness of smallholder dairy production	1.8	30.8	-	-	0.8	14.1	3.1	55.1	-	-
2. Improving small-scale value addition and access to market	1.9	52.1	0.3	8.4	0.0	-	1.3	35.4	0.2	4.1
3. Project Management and Support	1.2	40.2	0.3	8.7	1.0	31.9	0.6	19.2	-	-
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Expenditure Accounts by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. Investment Costs										
A. Vehicles	0.4	68.0	-	-	0.2	32.0	-	-	-	-
B. Equipment and material	0.5	22.9	-	-	0.0	-	1.5	70.1	0.2	7.0
C. Technical Assistance										
1. International Technical Assistance	0.0	100.0	-	-	-	-	-	-	-	-
2. National Technical Assistance	0.4	13.8	-	-	-	-	2.7	86.2	-	-
Subtotal Technical Assistance	0.5	14.3	-	-	-	-	2.7	85.7	-	-
D. Studies	0.6	49.1	0.6	50.9	-	-	-	-	-	-
F. Training	0.5	40.4	-	-	0.0	-	0.8	59.6	-	-
Total Investment Costs	2.4	28.7	0.6	6.9	0.2	2.0	5.0	60.6	0.2	1.8
II. Recurrent Costs										
A. Salaries	0.9	46.1	-	-	1.1	53.9	-	-	-	-
B. Incentives	1.4	81.1	-	-	0.3	18.9	-	-	-	-
C. Operation and Maintenance	0.3	53.5	-	-	0.2	46.5	-	-	-	-
Total Recurrent Costs	2.5	61.1	-	-	1.6	38.9	-	-	-	-
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2

III. Project implementation

A. Approach

140. Based on previous and ongoing experience with implementation of IFAD supported projects, and given the limited capacity at the MOA's level, HALEPP implementation would combine making use of relevant directorates within the MOA and outsourcing to qualified institutions (universities and international organisations), NGOs and private service providers. Their involvement would be through **call for proposals and performance based MoUs**. In this regard, and as stated in Appendix 5, many NGOs have been active in providing support to the smallholder farmers and rural women on transfer of technology, agricultural extension and access to markets. The most active ones are Rene Moawad Foundation, Mercy Corps, The Association for the Development of Rural Capacities, Rural Delights Cooperative, Caritas Lebanon Migrant Center, Action Against Hunger, Amal Association, Muslim Aid, Concern Worldwide, Jihad Al-Bina'a Development Association, Hariri Foundation, Safadi Foundation, Associazione Volontari per il Servizio Internazionale, Cooperative Housing Foundation, Young Men Christian Association, etc. In addition, HALEPP could make use of the services of AUB and the Lebanese Centre for Renewable Energy.

141. A specially created Project Directorate (PD) with qualified staff recruited on a competitive basis will coordinate the project. The physical location of the PD office will be at the MOA, reporting directly to the Office of the Minister. The PD core staff will include a full time Project Director and full time professional and support staff to oversee the day-to-day operations of the project, namely: Financial Manager, Procurement Officer, Accountant, Monitoring and Knowledge Management and Community Mobilization-Targeting/Gender Officer, Administrative assistant, and two drivers. In addition, the relevant staff from the Animal Resources Directorate and Education and Extension Service will be involved in the project management on a part time basis.

142. In line with the practice for IFAD-funded projects in Lebanon, a Project Steering Committee will be established to provide policy direction for the project; review and approve annual work plans and budgets; and provide oversight to the project management team to ensure effectiveness. Membership of the PSC will include: representatives of the Ministry of Agriculture, General Cooperatives Directorate, Ministry of Social Affairs, Office of the Ministry of State Displaced Affairs, Microfinance Institutions, etc.

Skills Improvement for Employment in Agriculture and Agro-processing

143. As a cross cutting theme within HALEPP focus on dairy development, the Project Management and Support component would include a training activity aimed at improving access of young Lebanese in host communities affected by the Syrian crisis and young Syrian refugees to employment in agriculture and agro processing.

144. The need for vocational training and skills improvement stems from the fact that unemployment in Lebanon, as elsewhere, is especially high among youth and disproportionately high for women, a rapidly growing component of the labour force. According to an ILO survey conducted in 2015, youth 15–24 had an unemployment rate estimated at 34%. Meanwhile and based on the same ILO report, the Syrian refugee labour force 15 years and above is estimated at about 239,700 in mid-2014, accounting for about 14% of Lebanon's total labour force. Of these, an estimated 160,500 were employed, equal to about one in ten of all employed persons in the country. With limited opportunities in a slow-growing economy, the estimated number of unemployed Syrian refugees is 79,200 – more than half of all unemployed persons in the country. overall estimated unemployment rate for Syrian refugees is 33%, about four times the average rate for Lebanon. The ILO survey found that unemployment among female refugees was about 68%, the result being that, in absolute terms, there are more unemployed female than male Syrian refugees in Lebanon. The ILO survey found the highest concentration – more than one-third – of the employed was found in

private services, ranging from drivers, housekeepers and caretakers to, in some cases, technicians and professionals. Employed females were particularly concentrated in these activities. Agriculture accounted for about 28% of refugee employment, mostly skilled agricultural labour and overwhelmingly male.

145. As a response to the need for employment creation, the FAO has recently developed a "vocational training and education" four years (2016-2019) project -Upgrading the technical agriculture education system in Lebanon- funded by the Dutch Government and aimed at building the capacity of MOA's Education and Extension Service under the Directorate of Studies and Coordination.

146. Through linkage to the FAO project and making use of the 7 vocational schools being rehabilitated by this project, HALEPP would support training of around 500 young Lebanese and Syrians who would be willing to build their vocational skills.

B. Planning, M&E, Learning and Knowledge Management

Planning

147. A key planning instrument will be the annual work plan and budget (AWPB). The first AWPB will be prepared, together with the procurement plan for the first 18 months of the project, as part of the final design report, and be presented for discussion during the start-up workshop for submission to IFAD for no objection. The preparation of the following AWPBs should be prepared, discussed and approved no later than sixty days before the end of the fiscal year. Experience shows that this review process requires a minimum of six months. If required the PD, through the PSC, can propose adjustments in the AWPB during the relevant project year, which will become effective after clearance by IFAD.

Monitoring and Evaluation

148. The Monitoring and Evaluation (M&E) system is designed to offer comprehensive and reliable information to improve planning and decision-making for results- based management. The M&E of HALEPP achievements and knowledge management would be the responsibility of PD. An M&E specialist will be responsible for collection of relevant data on the activities, outputs, and outcomes.

149. The logical framework would constitute the basis for results-based M&E, and include an initial list of indicators to track progress and achievements. This will be through accounting for progress against AWPB targets; and routine, periodic assessments of movement towards beneficiary impact. The Project draft M&E matrix will be prepared in a participatory manner as part of the start-up activities in line with the logical framework. As part of the M&E system, a number of studies/surveys will be conducted as follows:

150. **Project Baseline Study.** The project baseline is a critical element in the project M&E system. It will include the target group and a control group which will be essential to determine the attribution of results to project activities. At the beginning of implementation, a Baseline Survey would be conducted in selected locations to assess the physical and socio-economic status of the target group and to define their benchmark status.

151. **Mid-term Review.** An external evaluation performed towards the middle of the period of implementation of HALEPP, i.e. in year 3. It will assess operational aspects such as project management and implementation of activities as well as the extent to which the objectives are being fulfilled. It will focus on corrective actions needed for the project to achieve impact.

152. **Project completion survey (impact evaluation)** will include the same set of questionnaires included at baseline to allow for comparison against baseline results. In addition, a panel of households will be interviewed to provide a thorough analysis of project impact. Moreover, analysis will be done by type of beneficiary, region and gender of household head.

153. **The Results and Impact Management System (RIMS)** developed by IFAD since 2004 would be fully incorporated in the project M&E system. A systematic methodology and set of common indicators across programmes and regions to measure and inform on the performance and impact of projects. The RIMS report for the level 1 and level 2 indicators will be prepared at the end of each fiscal year and reported to IFAD before 31January.

154. **Geo referencing.** All activities of HALEPP will be geo-referenced at the village level. This will allow for monitoring of the coverage of the project intervention as well as the concentration of certain activities in specific areas. All extension sites, processing facilities supported by HALEPP and MFIs participating in the project will be geo-referenced.

155. **Beneficiary database.** The database will be developed for all beneficiaries of the project. Details about each beneficiary will be included in the database including: physical address, national identification, age, sex, and activities participated in. The database will allow for tracking beneficiaries and activities as well as providing a mean for sampling for data collection and visits during supervision missions.

Learning and knowledge management

156. The learning process will be part of the regular M&E activities. Lessons learned will be prepared and reported covering each component activities. The learning and knowledge management (KM) activities will include the regular monitoring mechanisms, progress reports, mid-term evaluation, and impact assessment evaluation at the end of the project. A special focus will be given for preparing a learning note on the dairy extension and dairy product labelling which are innovations in Lebanon context.

157. During the final year of HALEPP implementation, as part of the preparation of the IFAD-required project Completion Report/Impact Assessment (PCR), the M&E data collected over the project implementation period will be used as part of a thorough assessment of project achievements. In particular, this shall compare changes in the livelihoods of beneficiaries that are attributed to HALEPP against the baseline situation. Innovations and best practices at village level will be documented for the purpose of replication and scaling-up.

158. The FARMS' specific results and achievements will be mainstreamed into IFAD's M&E systems. Reporting on the results achieved by the Facility will be done as per current IFAD reporting coupled with a separate annual meeting on FARMS results and progress organized for donors and key stakeholders. Knowledge management and learning will aim to generate lessons learned and best practices, which can feed back into the activities of the Facility and IFAD's broader portfolio

C. Financial Management, Procurement and Governance

159. The PD will hire on a competitive basis a qualified Finance Manager and a project accountant through a competitive selection process. The FM staff will report to the Project Manager. As part of the project start up the FM staff will be trained in IFAD FM procedures and systems. The PD will maintain its accounting records in accordance with IPSAS-cash basis of accounting. The project transactions will be recorded in an accounting software to be procured as part of the project start up and maintained in the PD. Software that currently satisfy IFAD's requirements in the country include Logos and Techwise by Techrock.

160. In order to ensure: efficiency and reliability of financial reports; and compliance with applicable laws and regulations, the PD will ensure adequate internal controls including: Adequate policies and procedures, Sufficient segregation of duties; and Monitoring of fixed assets.

161. With regards to the flow of funds, government procedures will be applied to IFAD funding in the same way as with other donors including the World Bank. Accordingly, the IFAD financing will be channelled from IFAD through the Borrower's treasury accounts to three separate designated accounts, A (IFAD loan), B (IFAD grant), and C (FARMS grant) denominated in

USD and maintained in the Central Bank of Lebanon in accordance with IFAD's disbursement procedures. Designated Account A will receive IFAD loan funds through Ministry of Finance's treasury transit account for loans. Designated Accounts B and C will receive IFAD grant and FARMS grant funds through transit sub-accounts under Ministry of Finance's grants and donations account. The transfers from the MoF treasury sub-accounts will be based on requests made by the PD through MoA. The project designated accounts A, B and C will be operated independently by the PD under the joint signature of the PD Coordinator and the Finance Manager of the PD. In addition, there will be a separate counterpart account for government contribution.

Procurement

162. As part of the design mission that took place in April 2017 for HALEPP, IFAD undertook an assessment of the Procurement activities done at the level of the Ministry of Agriculture – Lebanon as well as a quick assessment of the current procurement system applicable in the Country.

163. Lebanon's public procurement is based on two legal regulations (the Tender Regulations Decree of 1959 and the Public Accounting Law of 1963) which are outdated and do not meet the international procurement standards. Consequently, the system cannot ensure efficient procurement practices especially in procurement of Services where no selection procedures are defined for such procurement activities. The system will leave the implementing agencies with very limited competition-based techniques for contracting the supply of goods, works and specially the service delivery.

164. As part of the country's system, The Central Tender board (CTB) is responsible for the processing of procurement planning, processing of tenders and recommendation of award. The Court of audit (COA) has the prior administrative control over contracts exceeding the equivalent value of USD 50,000 which is a very low threshold in today's money values and which makes the procedures unnecessarily time consuming.

165. Several attempts have been made by the Government of Lebanon to develop and adopt a new procurement law based on modern model laws however, no law has been finalized yet. The latest draft law has been presented to the Parliament for revision and subsequently ratification before it can be officially adopted.

166. The assessment undertook by IFAD, showed that the Ministry is abiding by the Procurement rules and regulations that are currently applicable in the country however, due to the above mentioned weaknesses of the current system, procurement of goods, works and services financed by IFAD Loan and Grant and FARMS funds shall be carried out in accordance with the IFAD Project Procurement Guidelines. Any changes that may occur during implementation will be agreed with IFAD.

167. Appropriate thresholds that can maximize the efficiency of procurement will be set out in the Letter to the Borrower and in the approved Procurement Plan. Whenever possible, procurement of goods and works will be bulked into sizeable bid packages to attract adequate competition, thus resulting in cost-effective and efficient procurement. The foreseen procurement packages are a mixture between low and high in value with procurement packages to be done using ICB, NCB and a big number of RFQs.

168. A specially created Project Management Unit (PMU) with qualified staff recruited on a competitive basis will coordinate the project. The physical location of the PMU office will be at the MOA, reporting directly to the Office of the Minister. As part of the PMU, a procurement officer would be recruited competitively and with a performance-based contract. In order to establish sound procurement management system in the project and given the current country experience, there would be a need for intensive capacity development of the PMU staff. It is advisable that two procurement assistants seconded by the Government join the PMU during the first 2 years of the project lifetime in order to assist in the daily procurement

activities which are foreseen to be enormous based on the initial 18-month procurement plan developed for the project.

D. Supervision

169. IFAD would directly supervise the project at least one a year and focus on fiduciary and implementation support functions in collaboration with CPMT. In addition, and given the difficult political and institutional situation with limited capacity and the heavy presence of Syrian refugees, close technical supervision and implementation support missions would be jointly conducted by IFAD and the Swiss Development Cooperation (SDC) at least once a year but also on demand. Such close technical supervision and follow up would complement the regular IFAD supervision missions to ensure a positive impact on the two groups of HALEPP beneficiaries, i.e. Lebanese small producers and processors and Syrian refugees. The composition of the technical supervision missions would benefit from the long Swiss expertise in dairy production and processing, for the transfer of appropriate managerial and technical knowhow to the producers, processors and marketing cooperatives, as well as in the cross cutting theme of gender and targeting.

E. Risk identification and mitigation

170. The main risks and potential mitigation measures are:

Main risks	*Potential mitigation measures*
SYR lose their legal status (not renewing) and 'fall out' of ongoing project activities.	The project will engage in policy dialogue with government authorities to prevent beneficiaries drop out.
Delay in early project implementation	Intensive training of PD staff and use of NGOs and service providers.
Uncontrolled imports from Syria destabilizes the dairy market in Lebanon.	The GoL is committed to control the Syrian boarders, combat smuggling. The number of small ruminants entering Lebanon has started declining.
Influx of Syrian refugees continues to rural communities, add more pressure on infrastructure and food demands, and thereby increases food prices including milk products.	The project will assist the GoL to improve rural infrastructure and increase milk productivity. The project will partner with international and national institutions and NGOs to leverage support to communities hosting Syrian refugees.
Unregulated importation of cheaper milk products suppress local initiative to increase dairy production and value addition through modern processing.	The Ministry of Agriculture has recently initiated a more inclusive process, convening stakeholder's fora to discuss various issues concerning the dairy sector, including milk price. The project will support the MoA's initiative ensuring a regular frequency in the organization of these fora and facilitating smallholder farmers and small scale processors participation.
Disease outbreaks (FMD, PPR etc.) may cause significant economic losses to dairy producers and processors if contingent and prophylactic plans are not effectively and efficiently funded and implemented by national veterinary authorities.	The Government has put in place, but insufficient, mitigating factors for disease control as there are regular vaccination campaigns against these diseases. The project still assist in building the national capacity to mitigate risks of disease outbreaks.
The effect of climate change would have significant impact on natural resources, in particular pasture and forage/crop production, affecting seasonal available grazing, and thereby reduce nutrition and consequently lactation levels of traditional and improved breed cattle.	The project will educate participating dairy farmers on forage conservation techniques as well investment in pasture improvement and conservation at farm level. The project is expected to promote investments in climate-resilient and low-carbon post-harvesting procedures, drying/cooling, processing and value addition to generate reductions in product losses and increase farmers and rural labourer incomes.

IV. Project costs, financing, benefits and sustainability

A. Project costs

171. The total project costs, for a period of six years, are estimated at USD 12.5 million or LBP 19.7 billions. All costs have been estimated on the basis of prices prevailing in Lebanon in April 2017. The base cost amount to USD 11.8 million (90% of total costs). Investment costs represent 64.6% of total costs. Operating costs accounting for only 35.4% of total costs. Physical and price contingencies account for about 9.5% of total costs (table 1). A complete set of summary tables and detailed costs tables will be in Appendix 9.

Table 1: Components Project Cost Summary

LEBANON						
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)						
Components Project Cost Summary		**(LBP)**			**(US$)**	
	Local	**Foreign**	**Total**	**Local**	**Foreign**	**Total**
1. enhancing competitiveness of smallholder dairy production	6 451 425 000	1 352 325 000	7 803 750 000	4 300 950	901 550	5 202 500
2. Improving small-scale value addition and access to market	3 985 260 000	989 160 000	4 974 420 000	2 656 840	659 440	3 316 280
3. Project Management and Support	3 667 440 000	404 760 000	4 072 200 000	2 444 960	269 840	2 714 800
Total BASELINE COSTS	14 104 125 000	2 746 245 000	16 850 370 000	9 402 750	1 830 830	11 233 580
Physical Contingencies	237 755 250	135 812 250	373 567 500	158 504	90 542	249 045
Price Contingencies	1 280 583 445	125 319 018	1 405 902 463	853 722	83 546	937 268
Total PROJECT COSTS	15 622 463 695	3 007 376 268	18 629 839 963	10 414 976	2 004 918	12 419 893

172. **Project Financing**. Detailed financing tables are summarised in Appendix 9.

173. The IFAD USD 600,000 grant financing aims at assisting the PMU in (i) conducting the base line survey and better targeting and gender focus; and (ii) promoting advocacy of smallholders' dairy producers and processors as important actors within the dairy stakeholder's platform for inclusive policy dialogue. The IFAD loan of USD 4.9 million (or 44.2% of total costs) serves to finance items such as vehicles, equipment for extension, preparation and production of training and learning materials, AT and equipments for revamping the surveillance system, trainers and training material for supporting value addition, renewable energy applied to the dairy sectors, improvement of access to rural finance, project management and M&E.

174. The FARMS grant of USD 5 million (or 36.4% of total costs) will be used for improving access to employment in agriculture and agro-processing, subcontracting NGOs for extension, training of TVET, acquisition of ear tags, Providing laboratory kits for surveillance, Support private vet., supporting on/off farm dairy processing, Supporting access to market, TA for rural finance and M&E.

175. The Government will make a contribution of USD 1.8 million (or 13.8% of total costs). This contribution will cover Project support salaries of PCU Staff, taxes, and running costs of vehicles. Beneficiaries will participate to on/off farm dairy processing equipments (by 20% of costs of these items). This participation is estimated at USD 0.2 million, equivalent to 1.2% of total project costs.

Table 2: Components by Financiers (USD'000)

	IFAD loan		IFAD grant		FARMS		Beneficiaries		Borrower/ counterpart		Total
Expenditure category	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*
1. Vehicles	400	68	-		-	-	-	-	200	32.0	500
2. Equipment and materials	500	22.6	-		1 500	70.5	200	6.9	-	-	2 200
3. Technical assistance	500	14.3	-		2 700	85.7	-	-	-	-	3 200
5. Studies and workshops	600	49.1	600	50.9	-	-	-	-	-	-	1 100
6. Training	500	41.3	-		700	58.7	-	-	-	-	1 300
7. Salaries	900	39.7	-		-	-	-	-	1 400	60.3	2 300
8. Incentives	1 400	100	-		--		-	-	-	-	1 400
9. Operation and maintenance	300	53.5	-		-	-	--		300	46.5	500
Total	4 900	39.4	600	4.6	5 000	40.5	200	1.2	1 800	14.2	12 400

B. Summary benefits and economic analysis

176. **Financial analysis.** Both the financial and the economic analyses are based on dairy activity budgets. Eleven models relates to dairy and the support of dairy value chain activity models have been considered in the analysis. Individual livestock budgets have been used to calculate the value of production net of inputs and labor costs. Livestock models included in the analysis encompass sheep, goats, and cows models as well as a model combining cattle and small ruminants. Dairy activities could be adopted by smallholder dairy farmers and agro-pastoralists. Eleven models reflects different agro-ecological conditions in Lebanon are analysed: Model 1 (4 cows selling milk to Hallab), Model 2 (7 cows selling milk to Hallab), Model 3 (4 cows process milk and selling dairy products), Model 4 (7 cow process milk and direct sale of dairy products), Model 5 (Goat, sedentary system with 50 adult female goats, grazing public land and adding concentrate, selling milk to Hallab), Model 6 (Sheep, semi-nomadic farming systems with 120 female sheep (Awassi) where producers have no land and pay a rent for accessing rangelands, direct milk selling to Hallab), and Model 7 (and a combination of 7 cows selling milk to Hallab and 50 adult female goats of Model 5). Four processing units models: Model 8 (500 liter off-farm milk processing to yogurt (leben), Model 9 (off-farm 500 liters milk processing to Lebneh), Model 10 (Off-farm 5,000 liters per day milk processing), and Model 11 (off-farm milk processing into new dairy products-5,000 liters daily capacity).

177. For activity models for dairy/processing units, the increase is due to the use of new technologies and good agricultural practices. In terms of inputs costs, feeding cost represents the main costs. The tendency is at an increase for fodder use and a decrease for concentrate. The adoption rate in all models follows an S shaped curve.[10]

178. Dairy activities show high financial returns due to the proposed project activities. The models show a net income per animal per year of around 50%. The good financial performances in terms of FIRR and FNPV are achieved despite the relatively high cost of inputs including feeding cost per animal and labour costs. The IRR range from 18.3% to 25.7% for the four cows and mixed models. The IRR for the two small ruminant models is 14.7% to 19.8% (goat and sheep models). The dairy processing models present an average FIRR of 15.2%. Employment opportunities created per livestock and processing units models indicates that around 12,600 employment will be created with 85% in the livestock farming system (Model 1 to 7) while 25% will be created through processing models (Models 8 to 11).

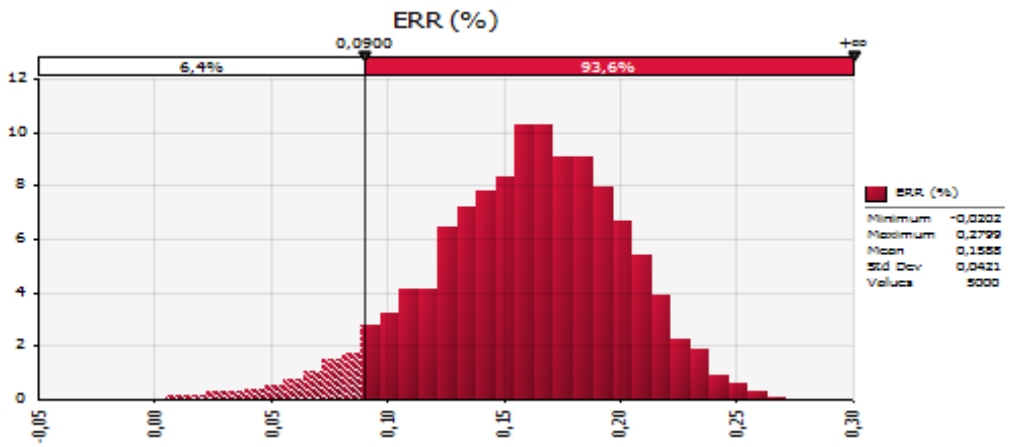
[10] 5% in year 1, 10% in year 2, 20% in year 3, 30% in year 4, 40% in year 5, 50% in year 6, 60% in year 7, 70% in year 8, 80% in year 9 to year 15.

179. **Economic analysis.** The computation of economic costs is derived from financial project costs, by excluding transfers such as duties, taxes, and price contingencies. The analysis is undertaken in constant terms with a constant exchange rate of LBP 1,500/USD. The opportunity cost of capital (OCC) is assumed at 9%[11] to take into account the country and the currency risk on Lebanon. Labor cost has been shadow priced at conversion factor of 0.75 to stand for market imperfections.[12] Inputs and outputs are adjusted in the economic analysis by eliminating taxes as transfer payments for tradable items. The flat tax rate applied is 11%. The project has an EIRR of 16.2% and a positive economic net present value (ENPV) of USD 22.2 million suggesting a feasible project.

180. **Sensitivity and risk analysis.** The project is robustness with an increase in costs/decrease in benefit. Costs should increase up to 270% or benefits should drop to 73% to reach the 9% OCC. The price of milk needs to decrease at least four times in order to have an EIRR less than 9%. The feed cost increase by 10% to 30% shows that HALEPP is still worthy and the impact of feed cost rise on overall project profitability is limited. The project is still worthy with delays in benefits of 1 to 3 years. Even in case of a simultaneous change on both costs and benefits, the project is still worthy with an increase of costs by 20% and a decrease of benefits by 20%. But an increase of costs by 30% with a simultaneous decrease in benefits by 20% generates an EIRR less than the OCC (Appendix10).

181. Models M2, M3, M5, and M10 are the most influential models in HALEPP (Appendix 10). Livestock fertility and lactation are the most influential parameters in the project, and more focus should be drawn to them in order to ensure the profitability of the project. The probability distribution of the EIRR (graph 1) shows that there is 93,6% chance of having an EIRR greater than the OCC. Within the probabilistic context, the most likely value of the EIRR is 15.88%.

Graph 1: Probability distribution of the EIRR of HALEPP project



182. The HALEPP project is robust and worthwhile, especially if we consider the conservative **assumptions** made in the computation of the benefits. The project therefore has a positive impact on household welfare and allows smallholder dairy producers and processors a higher propensity to participate to its activities. Moreover, the project will have a multiplier effect and higher marketing value added.

[11] The OCC is higher than the deposit rate (7.08%). The Lebanon Central Bank (LCB) used a long-term fixed deposit rate of 7.08% for 7 years, 6.74 % for five years, 6.5% for three years, and 5.35% for one year.
[12] The conversion factor is used as in similar projects in Lebanon such as HASAD project (2010) and HASAD supplementary fund (2012).

183. **Social Cohesion.** In addition to economic and financial benefits of the project, it would also be a good source of social cohesion between the Syrian refugees and the host Lebanese communities affected by the Syrian crisis. HALEPP contribution to social cohesion would be stem from at least three aspects: (i) the design of HALEPP has taken into consideration an important lesson from previous donors support to the refugees whereby, the initial international response was purely humanitarian and targeted to Syrian nationals only, failing to not harm the already fragile and shocked Lebanese system and the relations between the refugees and their host communities. HALEPP is therefore designed in such a way to respond to the needs of the smallholder dairy producers and processors from both Lebanese population and the Syrian refugees in the communities affected by the crisis. By focusing equally on host communities and refugees, this ensures the projects' inclusive approach will help build positive relationships between refugees and local communities in order to minimize tensions and create more resilient and tolerant societies; (ii) HALEPP, through intensive follow up and monitoring of implementation, would help prevent service providers contracted by the project from taking advantage of Syrian refugees' vulnerable situations. The equal treatment of both groups by the service providers would reduce tensions among host committee and refugees; and (iii) the skills improvement programme for the young Lebanese and Syrian refugees is a win-win initiative. On one hand the Lebanese employers would find at their disposal a pool of skilled farm assistants. On the other hand, the trained Syrian refugees would enhance their chances of employment.

184. **Impact on Food security.** HALEPP would have a positive impact on food security for the Lebanese and Syrian households in project area for three reasons: (i) for smallholder dairy farmers and processors some of the extra milk produced would be kept for home consumption, (ii) sales of milk and other dairy products would generate extra income, hence food security, and (iii) indirectly, HALEPP investment in production and processing and in skills improvement of young Lebanese and Syrians would create employment in agriculture and dairy sectors which in turn would generate income for the purchase of food and other items. The particular focus of HALEPP on women would further enhance the significant role that women play in household food security, dietary diversity and children's health. The project training programme would include awareness and sensitisation of women and local communities (Lebanese and Syrian) on the importance of children balanced diet and hygiene aspects.

C. Sustainability

Technical and financial sustainability

185. The design of the various vocational and extension training activities for dairy production and processing and for other skills improvement will be tailored in a manner which will be relevant for the women, youth and smallholders for employment generation, self-employment and enhancing agriculture and dairy production and processing.

186. All investments in dairy processing will be undertaken based on a clear plan for their ownership, operation and management. The Project will in each case assist the home-based and smallholder processors and their associations and organisations to develop a plan which shows the management requirements and the types of user fees to be levied to run the operation on a sustainable basis.

187. The Project's emphasis is on building local capacity for services which the dairy producers and processors, individually or through their associations or cooperative, will be willing to pay for, such as artificial insemination services, animal vaccinations, improved animal feed, etc. Links would be established with the private sector service providers and goods suppliers for a sustainable business arrangement with the smallholder producers and processors.

188. The enhancement of milk and dairy products quality would enable the smallholders to establish long lasting business links with market outlets and local consumers who are willing to pay a quality premium.

189. The establishment of stakeholder's platform with participation of smallholders' dairy producers and processors, would be a good opportunity for this group to voice their concern visa-a-vis the dairy industry and regulatory processes. The main issues addressed by the platform could be (i) quality issues and how to establish a quality payment system; (ii) price negotiation and regulation, with the aim of having a fairer price mechanism that benefits better to smallholders; and (iii) participation in policy processes.

190. The project would promote the linkage of target group to formal financial sector for lending in the dairy sector. A product will be developed and tested by three to five FIs selected on a competitive basis with technical support from the project. This initiative would demonstrate the viability of sustainable inclusive finance in the rural smallholder dairy market.

191. **Environmental sustainability.** Project support to innovative renewable energy sources and to dairy farm waste treatment (biogas production) will contribute to the reduction of production cost and reduction of pollution.

Appendix 1: Country and rural context background

1. Lebanon has an estimated population of 5.988 million (UN, 2016) and per capita income of USD 7,940 in 2015. The population is 90% urban, with a density of 449 inhabitants per km^2 in 2011. Density recently surged to 572 per km^2 from the influx of Syrian refugees.

2. Lebanon has a free market economy. The services sector contributed 75.4% of GDP in 2015 mainly through banking and tourism, while the agricultural sector accounted for 4.6%. Livestock products contribute nearly 2% of GDP.

3. Real gross domestic product (GDP) growth for 2016 was estimated at 1.8%, reflecting the impact of regional turmoil (World Bank 2016). While real GDP grew by an estimated 4.8% on average from 1993 to 2015. Falling growth since 2011 and the large fiscal burden associated with Syrian refugees' access to public services and infrastructure have pushed the debt-to-GDP ratio higher again (around 140% as of end-2015), resulting in a marked deterioration of the country's macroeconomic environment. The growth outlook remains subdued given the ongoing conflict in Syria. The World Bank projects real growth between 2 to 2.5 yearly over the medium term (World Bank 2016).

4. Meanwhile neighboring Syria is suffering the biggest conflict and the worst humanitarian and refugee crisis of the 21st century, with large regional and global ramifications and spillover effects. The Syrian refugee crisis has resulted in unprecedented social and economic challenges to Lebanon, putting further stains on its decaying infrastructure. Lebanon hosts 450,000 Palestinian refugees and the conflict in Syria has brought an additional 1.5 million Syrian refugees, placing Lebanon as the country with the highest number of refugees per capita in the world at an estimated one-third of the country's population. This dramatic surge in population is putting a strain on the country's resources, public services, and infrastructure. The fiscal costs related to the Syria crisis have also been considerable, amounting to an estimated USD 2.6 billion over the 2012–2014 period alone. This situation poses the risk of further destabilizing the country's fragile political, social, and economic situation. As the influx of Syrian refugees continues to increase, the capacity of the existing and decaying infrastructure will no longer be sufficient to meet the excess demand, and urgent public investments will be needed – imposing further and potentially substantial burdens on Lebanon's already stretched public finances.

5. the Syria conflict has also exacerbated the labor market situation. Since the refugee influx, the labor force in Lebanon increased by as much as 35% (UNHCR, Ministry of Social Affairs, Various Situation Reports, 2016). Because of the low level of education of the Syrian refugees - 87% of working age refugees have less than a secondary level education - the refugee crisis has also led to an oversupply of low skilled workers and to an increase in informality. Almost all Syrian refugees are working informally. The construction sector is the second largest employer of Syrian refugees in Lebanon (24.1%), after household work (26.5%), and is followed by wholesale/retail (11.1%), manufacturing (10.6%), agriculture (9.1%), food and beverages (4.9%), and others. The lack of opportunities for unskilled and low-skilled Lebanese and refugee workers is important, given that unemployment that affects specific social groups more than others (in this case refugees and lower-skilled Lebanese males, and youth within both groups) can lead to inter-group grievances that in turn fuel extremism and conflict.

6. The Ministry of Social Affairs launched the National Poverty Targeting Programme (NPTP) in 2011. The development objective of NPTP for Lebanon is to expand the coverage and enhance the social assistance package of the NPTP to Lebanese affected by the Syrian crisis and all Lebanese households under the extreme poverty line. In 2013, the World Bank increased its support to the NPTP through a USD 30 million project. NPTP provides a

package of social assistance benefits to 350,000 extremely poor Lebanese households and those affected by the Syrian crisis for a three-year period.

7. The Lebanon Crisis Response Plan was launched in 2015 as a strategic framework to allow the Government of Lebanon (GoL) and national and international partners to come together to deliver integrated and mutually reinforcing humanitarian and stabilization interventions. The LCRP promotes the strategic priorities identified by GoL and partners, emphasizing the role of GoL in leading the response with the oversight of the cabinet´s Crisis Cell. Interventions in the LCRP are aligned to national policies and strategies, and seek to complement and build on other international assistance in the country. The LCRP is designed to: (i) ensure humanitarian assistance and protection for the most vulnerable among persons displaced from Syria and poorest Lebanese; (ii) strengthen the capacity of national and local service delivery systems to expand access to and quality of basic public services; and (iii) reinforce Lebanon's economic, social, environmental, and institutional stability.

8. LCRP is organized along 7 strategic sectors, including one on food security; MoA, FAO and WFO lead the Food Security sector. The result framework for LCRP phase II (2017-2020) is currently under finalization, but it does not include any activity on the dairy sector. It is worth to mention that, to date, the current and planned interventions of IFAD in the country are not mentioned in the LCRP food security result framework, although they obviously contribute to it.

Agricultural Context

9. Lebanon has a Mediterranean climate with a relatively high average rainfall per annum: about 875 mm along the coastal plain and 620 mm in the central Beqaa valley. Lebanon faces significant challenges in meeting the country's water demand in terms of quantity and quality. Agriculture is the largest consumer of water in Lebanon.

10. Lebanon's main agricultural areas are the coastal strip, Akkar plain and the upper Mount Lebanon region, Bekaa valley, western slope of the Anti-Lebanon Range along the Syrian border, and the southern hills. Beqaa valley and northern Lebanon cover 67% of the total agricultural land that typically belongs to large commercial farmers. In contrast, southern zones are comprised of smaller farmers.

11. According to the Agricultural Census 2010, the total agriculture land area is estimated at 332,000 ha, of which 231,000 ha are cultivated (almost half 113,000 ha are irrigated), with an average land holding size of 1.36 ha (1.23 ha for irrigated holdings). The exploitation of these lands moved gradually from a cereal cropping to a cultivation offering higher added value (fruits, vegetables, etc.), resulting in a return per km² higher than in neighbouring countries.

12. Agriculture value added per square kilometre is higher in Lebanon than in many nearby countries (WB, 2010), reflecting a higher intensity of production and higher-value.

13. Lebanon is an exporter of fruit and vegetables; it is self-sufficient in poultry and produces 45, 15 and 10% respectively of its pulses, wheat and sugar. Lebanon is relatively more competitive in fruits and vegetables than in cereals and livestock. It imports roughly 83% of cereal consumption and 78% of its dairy and meat products (FAO/AQUASTAT).

14. Approximately 20 to 25% of Lebanon's actively working population is involved in the agriculture sector, including full-time and part-time workers as well as seasonal family labour. Around 92% of agricultural holders are single holdings whose owners operate their lands individually with family labour (FAO, 2011).

15. Agriculture in Lebanon is one of the most vulnerable sectors to climate change due to the limited availability of water and land resources and the pressure exerted by population growth and urbanization (IFAD). A recent study concluded at the American University of Beirut

concluded that by 2030, climate change would cause a 0.55% drop in GDP, largely through shifts in agricultural production.

16. Although agriculture makes a relatively minor contribution to Lebanon's overall economy (3.5% contribution to GDP in 2011), it plays an important role in rural areas, especially the poorest ones (IFAD). Over 20% of households engaged in this sector are very poor. Women, who make up one third of the agricultural labour force, are particularly disadvantaged (IFAD).

17. Livestock production is an important sector in rural areas as it represents one of the main activities (especially in the south and north regions of Lebanon that have the highest poverty rate in the country) with 60% of farmers depending on dairy products as primary means of subsistence.

18. The livestock sector suffers from several problems (MOA November 2011) including: weak animal health system resulting from the lack of permanent animal health programmes and inadequate application of animal welfare, irrational use of antibiotics and chemicals; the continuous decrease in rangelands and pastures (area and productivity); and contract farming which in most cases come in favour of traders. In addition to the above-mentioned problems, there are also some discrepancies in post-production management (collection and marketing), the poor conditions of slaughterhouses in terms of public health and productivity, and the reduced capacity to come-up with new processed products. Export promotion of products of animal origin even of high quality is weak, and there is an absence of traceability and implementation of international standards, which reduces the demand on these products

19. Aimed at addressing the above mentioned challenges and constraints, the Ministry of Agriculture has developed its new strategy for the period 2015-2019 (Ministry of Agriculture November 2014). The general objective of the strategy is to develop the institutional capacities and increase preparedness of the Ministry of Agriculture in order to overcome challenges in the agricultural sector and respond to crises that may arise through partnerships and collaboration among relevant stakeholders. The strategy specific objectives are three-fold: (i) to provide safe and quality food; (ii) to improve the contribution of agriculture to the economic and social development of the country; and (iii) to promote the sustainable management of natural and genetic resources.

20. The strategy defines eight main Courses of Action. The following five actions are the most relevant to HALEPP: (i) improve food safety and quality of locally produced and imported products, (ii) increase productivity and competitiveness of the Lebanese agricultural products with following actions: improving the value chains and increasing the value-added for products of plant and animal origin; strengthening sanitary and phytosanitary measures; (iii) improve the good governance and sustainable use of natural resources; (iv) strengthening agricultural extension and education with following actions: development of a pluralistic extension system relying on a common vision and integrated approach of education, research and extension in order to meet farmers' needs; promoting partnerships between the public sector, universities, research centres and associations providing extension services; and upgrading of technical agricultural schools to meet market demand; (v) development of the cooperative sector and mutual funds, and (vi) development of the Ministry of Agriculture capacities. The strategy also identifies the investment requirements for its implementation (in addition to MoA operational costs) to a total of around USD 330 million over five years.

Appendix 2: Poverty, targeting and gender

A. Poverty Characteristics

1. Lebanon has struggled to reduce widespread poverty and to generate inclusive growth. Poverty incidence has been elevated and broadly unchanged for the past 25 years. Since the end of the civil war, extreme poverty has hovered at between 7.5 to 10%; according to the upper poverty line, about 28% of the population is poor. The distribution of poverty has also been unequal, with poverty levels highest in the north and south of the country and in small, dense pockets in the suburbs of large towns, reflecting the unevenness of economic growth and development. Poverty has been widespread and persistent since 1990, contrasting sharply with progress made between 1961 and 1974, when poverty dropped from 50 to 22%. In addition to monetary poverty, a broader segment of the population suffers from non-monetary dimensions of poverty such as inadequate levels of education, health care, and access to basic infrastructure. Although Lebanon is an upper-middle-income country, weak and deteriorating public institutions mean that the state is unable to deliver satisfactory public services widely to the population. More affluent citizens are able to compensate by purchasing private goods and services (for example, private schooling, bottled water, and electricity generators), the poor and lower-middle classes are unable to compensate fully for their limited access to basic services. This inability adversely affects their living conditions and quality of life.

2. Sporadic attempts have been made to measure living conditions in Lebanon since the 1960s, despite the lack of micro-data, but there is little basis to compare these estimates over time, since the surveys used different methodologies and sample sizes. The most recent poverty study in Lebanon, and the most commonly used one for a poverty profile of Lebanon, is the 2007 national report, 'Poverty, Growth and Income Distribution in Lebanon' by the UNDP and Ministry of Social Affairs. Relying on the expenditure data from the 2004/05 National Survey, the study used a money-metric poverty measure and determined a national poverty line based on household expenditures. This study established a lower poverty line of USD 2.40/person/day and an upper poverty line of USD 4.00/person/day for Lebanon. Using these poverty lines, **28.6% of Lebanese households were found to be poor and of these, 8% were considered extremely poor or below the lower poverty line.** The discrepancy between this rate (28.6%) and the income-related component of the living conditions index (LCI) (51.6%) is noteworthy and indicative of the significance of the methodology used to measure poverty. Both studies however, concluded that disparities between the Governorates are glaring with Nabatieh, Beka'a, South Lebanon and North Lebanon as the most deprived and Mount Lebanon and Beirut the least deprived Governorates in the country. The 2007 UNDP study also measured inequality, using the Gini coefficient at 0.37 for nominal consumption and 0.36 for real consumption. The poorest 20% of the population were found to consume about 8% of total consumption, while the top 20% of the population consumed about 40%. Currently, the Ministry of Social Affairs claims that **Geographically, the highest poverty count is observed in Mount Lebanon, North Lebanon, South Lebanon and Bekaa which account for about 77% of all poor people in the country.**

3. The influx of Syrian refugees is having a profound impact on the socioeconomic situation in Lebanon. As of October 2016, the Government of Lebanon (GoL) estimates that the country hosts 1.5 million **Syrian refugees** who have fled the conflict in Syria. The majority of the refugees are located in regions already having high poverty rates. They are concentrated in specific pockets: **87% persons displaced from Syria and 67% deprived Lebanese live in 251 poor cadasters (as per Ministry of Social Affairs classification) out of a total of 1,653 cadasters in the country.** Vulnerable Lebanese households, with additional pressure on resources, face a decrease in income which leaves them increasingly unable to meet basic needs, including food and/or healthcare; displaced Syrian households are suffering the impact

of protracted displacement and sinking deeper into debt and negative coping mechanisms as they struggle to meet their families' needs. Nearly 95% of Syrians are food insecure, 52% are living below the minimum poverty line of USD 2.4 per day and 41% have inadequate shelter. Ninety-one percent of households have an average debt of USD 857. Sixty percent of Syrians over the age of 15 do not have residency permits which restricts mobility and employment. Syrian households are characterized by high dependency ratios (97.4) and there is an inordinate number of female-headed households. The overall estimated unemployment rate for Syrian refugees is 33%, four times the average for Lebanon. Unemployment among women is about 68%. Twenty-eight percent, mostly men, are employed as skilled agricultural labour and 12 in construction. Over one-third of Syrians, especially women are employed in private services, with the rest employed in commerce. The GoL allows Syrians to work as labour in agriculture and construction. There are some other professions allowed if there is a Lebanese guarantor. Women earn substantially less with an average monthly income of LBP 248,000, or 63% below the national minimum wage. About one-fifth of employed Syrian refugees earn something near or above the minimum wage.

4. **Rural Poverty.** In 2014, 12% of Lebanon's population was estimated to be rural. Poverty is prevalent in the mainly rural mohafazats (provinces) of Akkar, North and South Lebanon and Baalbek-Hermel. The rural poor are mainly small farmers, livestock herders, wage labourers, fishers, and women who are heads of households. The rural population accounts for an estimated 20-25% of the active population with some activity in agriculture. Poverty is particularly acute in rural areas and agricultural households. **Compared to Lebanon's overall poverty rate of 8%, more than 20% of households engaged in agriculture fall below the poverty line.** The sector's high productivity and high poverty rates are the result of very small landholdings with 90% of all farms between 0.1 and 4 ha and an average farm size of less than 1.5 ha, limiting the scope for full-time employment. Moreover, Lebanon's agriculture sector is currently experiencing downward pressure on wages as a result of the arrival of more than 1.5 million Syrian refugees seeking jobs in rural areas. Unlike other sectors, there is no legal restriction concerning agricultural labour and no minimum wage requirements for Syrian refugees.

5. **Women and Rural Poverty:** Agriculture employs 7.2% of the total workforce and 4.6% of the women's workforce while employing 10% of active men. It does not capture unpaid work. **Rural women constitute 34% of the total family workforce in agriculture as unpaid labour and work a 14-hour day**. Their responsibilities include planting, weeding, harvesting, food processing, livestock rearing and selling. They produce mostly staple crops for household and small-scale cash crops. They work manually and with rudimentary equipment, collect wood for energy and nearly 40% of remote rural villages require women to fetch water. Women are hired for seasonal agricultural work during harvest time with low salaries. Women also struggle to assert rights to inherit land. Their involvement in agriculture appears to be decreasing.

B. Target Groups

6. The primary target group of HALEPP would be women and men who are smallholder livestock farmers of cattle and small ruminants and for whom livestock is a source of income, food security and a safety net. In Lebanon, the majority of livestock owners are small holders: 90% of cattle farmers have between 1 and 15 heads of cattle and 70% of sheep and goat farmers have under 50 heads. The project would be engaging both the vulnerable cattle and small ruminant farmers who operate at a subsistence level and those with higher productive potential. Small scale and medium processors who process up to 5 tons of milk would be another important target group for the project. Syrian refugees, a poor and highly vulnerable population, would also be an important target group.

7. **Poor smallholder men and women dairy cattle farmers.** These farmers can own up to 7 milking cows with the entire herd comprising around 10 heads of cattle. Household size can

range from 4 to 12 members. Education levels vary but are likely to be up to intermediate or below. The project would be targeting both the vulnerable famers with 2 cows operating at subsistence level with marginal surplus and those with higher productive potential who have 3 to 7 cows but are primarily dependent on income from livestock. These farmers may be landless, owning only their house and a small area around it, they may access some land for cultivation or own a few donums. Some farmers grow fodder for their cattle but most buy fodder. Women are highly active in livestock farming. There is a gender division of labour with women's tasks including feeding, livestock, watering animals, cleaning sheds and milking and men accessing veterinary care for animals, buy feed and sell and buy animals and dairy by-products. However, in reality these roles are not so strictly defined and there are variations by regions and households. In all cases, women's involvement in home-based processing of dairy by-products such as yoghurt, different kinds of cheese is high. Milk may be sold to neighbours, hallabs (middlemen) or small processors at a price ranging from 550 to 1,100 LL/kg. Dairy by products such as yogurt and different cheeses may be sold at the farm-gate or at local markets. They can usually access vets, however, at 50,000 LL per visit not including cost of treatment, veterinary care can be expensive and unaffordable. The major constraints faced by these men and women farmers include lack of access to land, low productivity of livestock due to poor feeding and management practices, inability to afford feed and veterinary care as well as lack of access to credit on favourable terms. The major constraints women face include their triple burden of work, cultural norms that can limit mobility, inadequate knowledge of animal husbandry practices for greater productivity as well as limited access to markets. These men and women farmers would benefit from participation in extension programmes which would enable them to increase productivity of livestock with better feeding practices and management of livestock, improve milk quality and profitability of livestock. They would also benefit from the enhanced vaccination programme funded by IFAD. As small-scale processors, they would benefit from capacity building to improve hygiene standards and the quality and profitability of their products.

8. **Poor small-holder semi-extensive farmers with small ruminants.** These smallholders men and women farmers would primarily be semi-extensive farmers owning up to a herd of 200 goats and sheep. Women are involved in milking, cheese making and in some cases they are involved in direct sale and marketing of milk, labaneh, laban and cheese delivering it to customers from farm to houses especially in the mountains. These herders may be landless or have a few donums, owned or rented, for production of some vegetables. Women are involved in caring for animals, milking cheese making and in some cases in direct sale and marketing of milk, labaneh, laban and cheese, often delivering it to customers. During the annual grazing period (April to October). herders traditionally migrate setting up temporary settlements to graze their herds at higher altitudes. Local herders are sedentary, returning to their villages each night after grazing. Following the end of this grazing period, both Bedouin and local herders winter their animals in lower altitudes providing feed bought from input suppliers. semi-extensive producers usually seek treatment for their animals in winter. The prime milking season for goats is from March to August, and sheep from March to late June. The Lebanese small ruminant breeds produce an average of only ½ kg – 1 kg/day of milk. Milk is generally collected by private collectors (hallabs) who work with personal networks of producers. Hallabs buy goat and sheep milk anywhere from 900 -13,000 LL/kg depending on the quality of milk (mostly fat content) and the transportation involved. However, as the milking season ends, prices can rise to 1,500 -2,000 LL/kg. Hygiene also plays an important role in determining milk prices. Prices for milk containing traces of antibiotics, penicillin or dirt can drop as low as 700 LL/kg. These producers sell their milk to hallabs, or directly to processors. Many also produce baladi cheeses, ambriss, kishk or labneh for household use. These herders face multiple challenges: low milk production from local goat and sheep breeds, inadequate shelters, high incidence of on-farm disease resulting in antibiotic- and penicillin tainted milk which in turn results in loss of revenue, unhygienic production of household artisanal cheeses. In Bekaa, as a result of both the Syrian crisis and declining winter

precipitation, lack of greenery for foraging and limited access to traditional grazing areas is forcing many semi-extensive herders to adopt a semi-intensive system of production. This is reportedly resulting in a 30% decline in milk production due to poor nutrition and an increase in young animal mortality from water scarcity and diseases. Higher production (chiefly animal management) costs tied to semi-intensive production are putting extreme pressure on income and livelihoods, and are reportedly forcing culls as producers struggle to feed their animals.

9. **Mixed production systems.** A minority of farmers (10 to 20% in both categories) may raise both small ruminants and cattle. However, animals are kept separately and interactions between the two productions are minimal.

10. **Syrian Refugees.** These households are living below the poverty line, with high dependency ratios, in inadequate shelters and experiencing high rates of unemployment. A high percentage of households are women-headed. Coping strategies include reducing health and food expenditures (relying on cheaper foods, restricting adult's consumption, missing meals etc.), selling productive assets and household goods. One of the most significant challenges that these households are facing is lack of residency permits which restricts mobility and opportunities to earn a living. HALEPP would target women and men Syrian refugees who own livestock, labourers in agriculture and agro processing and unemployed youth. The small ruminant farmers would benefit from the project through participation in extension to secure their productive assets and improve profitability. Unemployed women and men as well as youth would benefit from short-term trainings in animal production and dairy processing and other agriculture activities.

11. **Women and men small scale to medium processors.** Laban, labneh and other cheeses are produced in the rural areas at home and in small to medium processing units owned by individuals or cooperatives. Home based artisanal processing is common in rural areas. Women are the processors, primarily, but men can be involved. Milk, produced at the farm or collected from neighbours is processed using basic utensils and procedures with variable levels of hygiene. The produce is used for home consumption, sold at the farm-gate, to neighbours and local shops. The small scale to medium processing units included in the projects target group process up to five tonnes of milk per day. They employ from two to seven women and men. Some small-scale units are run by cooperatives, especially women's cooperatives, supported by donor projects through provision of equipment and training. These units may collect milk from their own farms, buy directly from other farmers or from a hallab (middleman). In addition to cow milk, they may, seasonally, process goat/sheep milk. In direct collection, there is a tendency to collect milk from farmers with larger herds of over 10 cows. Some processors do collect milk from farmers with smaller herds but may pay a lower price to defray the transportation costs. There is a strong demand for high quality artisanal products and some producers are linked to shops and customers even in the cities. However, home-based processors and these processing units face several challenges. Home-based processors may face losses due to poor hygienic practices, lack of technical knowledge and investment in appropriate utensils, challenges in marketing their goods and getting a fair price. Small and medium processing units face challenges in accessing quality milk, competition from large producers using powdered milk, optimum prices and marketing. The project would benefit women home-based producers by training them to produce a more hygienic, higher quality product to improve marketability. It would provide small units with technical assistance to improve their products and assist them in accessing markets.

12. **Youth.** Youth in rural areas are inevitably involved in agriculture and livestock in so far as their families are engaged in these activities and off-farm employment opportunities are restricted. Only 12% of cattle farmers are under 35 years, indicating that youth are moving out of agriculture. The project would engage with youth by prioritizing them in the extension program for famers, and in capacity building of small processors and facilitators. The project would also train young women community-based facilitators to support home-based processors as well

as young Lebanese and Syrian willing to build their skills for employment in agriculture and rural infrastructure.

C. Poverty Targeting and Gender Strategy

13. **Poverty targeting approach.** The project would largely focus on the Lebanese communities who are among the poorest and the most affected by the influx of Syrian refugees as well as Syrian refugees by implementing its interventions on the 151 cadasters in which 67% of the most deprived Lebanese and 87% of Syrians live.

14. **Geographical targeting.** HALEPP would be national in scope and cover 7 governorates in Lebanon: Mount Lebanon, North, Akkar, Bekaa, Baalbek-Hermel, Nabatieh and South. HALEPP would ensure a balanced and equitable approach in the distribution of intervention villages and eligible beneficiaries among the 7 Governorates. Within the governorates, the following criteria would be used to select areas of intervention: (i) area should fall in the 251 most vulnerable cadasters; (ii) high dependency of the rural poor on livestock for livelihoods; (iii) interest of farmers and municipalities in project activities; and (iv) potential for developing linkages to market.

15. **Self-selection.** The project interventions for livestock farmers would principally be attractive for small-holders of livestock who have challenges with feeding their animals, limited knowledge of animal management practices and resource constraints. Similarly, short courses in animal production or processing would only be attractive for home-based processors and mostly unemployed men, women and youth, both among Lebanese and Syrian refugees.

16. **Direct targeting.** The project would target about: (i) 2,400 smallholder cattle farmers and 1,600 small ruminant farmers (it is estimated that this would constitute nearly 30% of all farmers owning up to 10 cows and 21% of all small ruminant farmers with herds up to 200 heads; a small proportion of these farmers (10 to 20%) may own both cattle and small ruminants; in this case, they will be targeted according to their primary production, to avoid double accounting, but they will benefit from project support for both production) (ii) 1,500 smallholder on-farm processors; (iii) 80 small to medium off-farm processors; and (v) 500 young Lebanese in host communities affected by the Syrian crisis and Syrian refugees, seeking employment in agriculture and agro-processing and rural infrastructure. In all the project interventions, there would be a strong focus on women who represent a specific target for IFAD, due to their traditional relevance in livestock production, their growing social and economic responsibility, and their vulnerable position in societies. The project would aim to target up to 30% Syrian refugees while up to 50% of young trainees for job creation would be Syrians.

17. **Empowering and Capacity building.** The participation of men and women small-holder farmers of livestock in extension activities, training in processing and technical assistance in marketing as well as representation in stakeholder forums will increase the capacities, confidence and the visibility of small holder women and men as livestock farmers and small/medium scale processors. Smallholder dairy farmers will be supported with the basic business management skills required for loan applications and credit repayment. Similar support will be provided to small dairy processors.

18. **Enabling measures for poverty targeting and mainstreaming gender.** The project would sensitize the MOA, policy makers and implementers through the inclusion of women and men farmers and small processors as participants of the stakeholder forums. The forums would be organized in a way that would ensure that project beneficiaries would have space to voice their views and opinions. HALEPP would sensitize financial institutions to the needs of its beneficiaries by assisting some financial institutions to pilot a product for smallholder farmers and processors, women and men and funding an assessment of inclusive, pro-poor financial services in rural areas. The products and the study would address gender issues.

19. The **gender strategy** of the project would be based on lessons from projects effective in the inclusion of women and the experience of projects in the livestock sector regarding interventions that can increase women's productivity and incomes, enhance their decision-making and control over productive assets and lead to their empowerment. Successful participation of women from poor rural households entails an approach that does not add to their transaction costs and yields real benefits for them. It also requires gender sensitivity to existing household division of work with respect to the management of livestock and dairy production.

20. The empowerment of women would be ensured through a range of strategies: (i) targets would be set for women's participation in all key activities with women and women-headed households receiving priority; (ii) the gender and targeting strategy would be reviewed yearly by the PD and partners; (iii) the terms of reference for staff and technical experts would include responsibilities for following the gender strategy of the project; (iv) the project would be sensitive to arrangements required to enable women to participate – such as organizing women only extension in areas where there are restrictions on mixed gatherings, arranging training at village or municipality level to accommodate women's time constraints or providing transport allowance; (v) the monitoring and evaluation framework would include qualitative and quantitative indicators disaggregated by sex to track the project's performance in promoting women's empowerment in terms of their capacity-building and benefits; (vi) the PD would be encouraged to maintain a gender balance in staffing, with women comprising at least 30% of the staff; (vii) a Gender and Community Mobilization Officer would be hired for the PD; (viii) organizations recruited for assisting in implementation of project activities would be required to have a demonstrated ability to work with women; (ix) women would be included in the annual stakeholder forums, the project would ensure the inclusion of women as livestock farmers and processors both as participants and speakers with the forum structured to ensure that they have space to voice their views and opinions; (x) any studies undertaken by the project would address gender issues and disaggregate data collection, analysis and findings by gender; and (xi) a poverty and gender specialist would be included in the yearly supervision missions, Mid-Term Review and Project Completion Mission.

IFAD'S TARGETING POLICY - CHECKLIST FOR DESIGN

	DESIGN
1. Does the main target group - those expected to benefit most- correspond to IFAD's target group as defined by the Targeting Policy (poorer households and food insecure)?	THE MAIN TARGET GROUP FOR HALEPP IS SMALL-HOLDER FARMERS OF CATTLE AND SMALL RUMINANTS WHO ARE AMONG THE POOREST HOUSEHOLDS IN LEBANON
2. Have target sub-groups been identified and described according to their different socio-economic characteristics, assets and livelihoods - with attention to gender and youth differences? (matrix on target group characteristics completed?)	YES – TARGET GROUP CHARACTERISTICS HAVE BEEN EXHAUSTIVELY DESCRIBED IN APPENDIX 2
3. Is evidence provided of interest in and likely uptake of the proposed activities by the identified target sub-groups? What is the evidence? (matrix on analysis of project components and activities by principal beneficiary groups completed?)	YES - EVIDENCE OF INTEREST IS BASED ON CONSULTATIONS WITH THE TARGET GROUP DURING FIELD VISITS AND PARTICIPATION OF TARGET GROUP IN PREVIOUS PROJECTS OF A SIMILAR NATURE. DETAILS OF ACTIVITIES FOR PROJECT BENEFICIARIES IN ANNEX 2.

4. Does the design document describe a feasible and operational **targeting strategy** in line with the Targeting Policy, involving some or all of the following measures and methods:	
4.1 Geographic targeting – based on poverty data or proxy indicators to identify, for area-based projects or programmes, geographic areas (and within these, communities) with high concentrations of poor people	THE PROJECT WOULD BE IMPLEMENTED IN ALL SEVEN GOVERNORATES FOR REASONS OF EQUITY. THERE ARE POCKETS OF POVERTY IN EACH GOVERNORATE AND THE AREA OF INTERVENTIONS WILL BE SELECTED FROM THE 250 CADASTERS WITH 67% OF THE MOST DEPRIVED LEBANESE AND 87 % SYRIAN REFUGEES
4.2 Direct targeting - when services or resources are to be channelled to specific individuals or households	YES
4.3 Self targeting – when goods and services respond to the priority needs, resource endowments and livelihood strategies of target groups	YES
4.4 Empowering measures - including information and communication, focused capacity- and confidence-building measures, organisational support, in order to empower and encourage the more active participation and inclusion in planning and decision making of people who traditionally have less voice and power	**YES**
4.5 Enabling measures –to strengthen stakeholders' and partners' attitude and commitment to poverty targeting, gender equality and women's empowerment, including policy dialogue, awareness-raising and capacity-building	**YES**
4.7 Operational measures - appropriate project/programme management arrangements, staffing, selection of implementation partners and service providers	**YES**
5. Monitoring targeting performance. Does the design document specify that targeting performance will be monitored using participatory M&E, and also be assessed at mid-term review? Does the M&E framework allow for the collection/analysis of sex-disaggregated data and are there gender-sensitive indicators against which to monitor/evaluate outputs, outcomes and impacts?	**YES**

IFAD's KEY FEATURES OF GENDER-SENSITIVE DESIGN AND IMPLEMENTATION

	Design
1. The project design report contains – and project implementation is based on - gender-disaggregated poverty data and an analysis of gender differences in the activities or sectors concerned, as well as an analysis of each project activity from the gender perspective to address any unintentional barriers to women's participation.	Yes - the project would be sensitive to arrangements required to enable women to participate – such as organizing women only extension programs in areas where there are restrictions on mixed gatherings, arranging training at village or municipality level to accommodate women's time constraints or providing transport allowance
2. The project design report articulates – or the project implements – actions with aim to: ● Expand women's economic empowerment through access to and control over productive and household assets;	The project addresses women's economic empowerment principally by aiming to increase income through capacity building for producing quality products and access to markets. Some kits would be given to women for these purposes.
● Strengthen women's decision-making role in the household and community, and their representation in membership and leadership of local institutions;	Yes, insofar as increase in expertise and inclusion in capacity building impacts status in the household. Women would be represented on the stakeholder forums and women's cooperatives would be strengthened through technical assistance and access to markets.
3. The project design report includes one paragraph in the targeting section that explains what the project will deliver from a gender perspective.	**Yes**
4. The project design report describes the key elements for operationalizing the gender strategy, with respect to the relevant project components.	**Yes**
5. The design document describes - and the project implements - operational measures to ensure gender- equitable participation in, and benefit from, project activities. These will generally include:	**Yes**
5.1 Allocating adequate human and financial resources to implement the gender strategy	**Yes**
5.2 Ensuring and supporting women's active participation in project-related decision-making bodies and committees.	**Yes**
5.3 Ensuring that project management arrangements (composition of the PD management unit, project terms of reference for staff and implementing partners, etc.) reflect attention to gender equality and women's empowerment concerns.	**Yes**
5.4 Ensuring direct project outreach to women (for example through appropriate numbers and qualification of field staff), especially where women's mobility is limited.	**Yes**
5.5 Identifying opportunities to support strategic partnerships with government and others development organizations for networking and policy dialogue.	**Yes**
6. The project's logical framework, M&E, MIS and learning systems specify in design – and project M&E unit collects, analyses and interprets sex- and age-disaggregated performance and impact data, including specific indicators on gender equality and women's empowerment.	**Yes**

Appendix 3: Country performance and lessons learned

1. Since 1993, IFAD has supported four operations in Lebanon with a total of USD 165.6 million, of which USD 53 million is IFAD financing. IFAD is currently supporting Lebanon through the "Hilly Areas Sustainable Agricultural Development" project (HASAD) focused on water management. HASAD implementation is behind schedule. Another project, "Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon" (AgriCAL) has yet to start.

2. The first agricultural project in Lebanon was the "Smallholder Livestock Rehabilitation Project" (SLRP; 1994-2003. Its components included restocking herds, livestock services (AI and vaccinations), establishing cooperatives, rural credit, and milk marketing. The restocking was intended to help producers recover from herd losses during Lebanon's civil conflict. The SLRDP did not reach its intended objectives for lack of in-country capacity, political interference and elite capture and top down approach. The biggest failure was the construction and management of milk collection centres without proper link to the needs of small producers.

3. Outside IFAD portfolio, two ongoing projects in the dairy sector (implemented respectively by FAO and Mercy Corps) provide support to small scale women cooperatives involved in dairy processing.

4. The main lessons learned from projects supported by IFAD and others regarding smallholders dairy value chain would be associated with the role of NGOs, cooperatives, and milk collectors (Hallab) and project management within the institutional country context. The main lessons learned could be summarised as follows:

5. **The cooperatives are not a panacea for the development of smallholder dairy value chain, but they could be very effective in managing processing units and linking to the market.** There are currently 1,239 registered cooperatives in the country, but 20% are thought to be active, according to the Directorate of Cooperatives. This Directorate has embarked in a cleaning exercise whereby cooperatives will be required to prove their operational capacity, or will be de-registered. Obtaining and maintaining the cooperative status implies a number of obligations, with its related costs, that seem to put a burden on small groups. Working in groups also doesn't seem to be traditional in Lebanon, except in the scope of the family or neighborhood. The cooperative status offers some advantages like for instance income tax exemption, and is often a condition to access to grants and loans. However, the project could explore some alternative group models like associations or informal groupings when the cooperative status doesn't' seem adequate or in the earlier phases of group dynamic.

6. **Role of NGOs in transfer of technology (training and extension services) and facilitation of market access.** In the domain of access to market for groups of smallholder farmers, innovative and successful business models can be found in Lebanon. They are based on arrangements between small producers' groups, and entities that support them for access to market. These entities consider themselves as social enterprises, NGOs or cooperatives, but irrespective of their status, the principles remain the same: they provide technical, managerial and commercial support to the groups, helping them to develop quality products that fits the expectation from the market (working on the process, the packaging, the identity of the product, the branding), and they establish the link with the market. Many of these entities have been established by projects, on crop value chains mainly, but their sustainability is good and the model could probably be applied to the dairy sector. In addition, many NGOs, mostly through donors funding, provide pro-poor extension and training services to smallholders. They all enjoy a large field presence in different parts of the project area. Such NGO involvement would mitigate the weak training and extension capacity of the MoA.

7. **Milk collectors cannot be bypassed.** The formal dairy value chain (where milk bought by medium and large scale processors) is characterized by the central role played by milk collectors. Very limited commercial transaction takes place directly between a large processing factory and a farmer, or a group of farmers (including a cooperative) without this intermediary. This intermediary could be family related to the processor in some cases. In some situation, the intermediary ensures cooling and/or transportation of milk. In this case, his services are paid an average of LBP 200 per liter. In some cases, he doesn't ensure any technical function, except "forwarding the invoice" but is still paid LBP 50 per liter. This is high in comparison with the benefit obtained by the producer, which ranges from LBP 100 to 200 per liter, because of the very high production costs and feeding charges in particular. In areas where this business model is practices, such as Bekaa area, producers and processing cooperatives, if well managed, could minimise the dominant role of the milk collectors for a better bargaining position of the small producers and processors.

8. **Monitoring and Evaluation.** Like many IFAD and other donors supported projects, the M&E system is always weak. In the completion review undertaken by IFAD the most recent projects in Lebanon, the lack of quantitative data on agricultural productivity, water use efficiency, input use, as well as adoption rates, was underlined. A **strong M&E unit should be established from the beginning of the project**, not only to look at the physical and financial aspects of the project, but also to follow-up on its sustainability and impact in terms of poverty reduction. Good baseline data and an early implementation of an effective monitoring system are essential.

9. **Project management.** The most recent ongoing project-HASAD- has encountered recurrent problems. After four years of implementation, tangible outcomes delivered to the target group are limited to only small soil- and water conservation infrastructure. the establishment of three financially sustainable Farmer Service Centres has not taken place. Many factors could explain this including a highly unstable political context, limited human resources in public administration, highly bureaucratic procedures, weak M&E system as well as elite capture for rural infrastructure. A PD (PD) attached to a Government body, e.g. MoA, managed by specialists recruited on a competitive and transparent basis, and working directly with the technical departments, is best placed to implement projects.

Appendix 4: Detailed project description

A. Component 1: enhancing competitiveness of smallholder dairy producers

1. The expected outcome of this component is to enhance smallholder dairy farming productivity and supply of quality milk; this will be achieved through outputs delivered under two activities.

   i. improving capacities of targeted smallholder dairy farmers; and

   ii. Improving animal management and productivity of cattle dairy herds and small ruminants' flocks in the project area.

Background and Rationale

2. Livestock production relies on cattle (59,700 heads in total, 10,400 farms, average 5.7 heads/holding), sheep (253,000 heads in total, 4,100 farms, 68 heads/holding) and goats (450,000 heads in total, 5,850 farms, 75 heads/ holding) according to the 2010 Agricultural census. The distribution of animal populations by region is shown in the table below. Bekka, Balbek and Hermel house around 50% of the cattle population and 2/3 of the small ruminants, and have the highest average size of herds (more than 20 cows per farm in Bekka) and flocks. Akkar and North, by opposition, contain more than 50% of the farms, but the average size of herds and flocks is much smaller, with 2.5 heads of cattle per farm in Akkar for instance. Cattle are reared for milk mainly, goats for both purposes and sheep mainly for meat. With less than one holding in eight involved, livestock production remains secondary in Lebanese agriculture.

Specie	**Cattle**			**Sheep**			**Goat**		
Region	Farms	Heads	Av per farm	Farms	Heads	Av per farm	Farms	Heads	Av per farm
North	1,524	6,693	4.39	368	14,383	39.08	1,073	32,198	30.01
Akkar	4,482	11,150	2.49	764	26,477	34.66	649	31,419	48.41
Baalbek & Hermel	1,261	10,874	8.62	1,215	100,538	82.75	1,665	106,034	63.68
Bekka	913	18,761	20.55	827	89,884	108.69	831	100,271	120.66
South	569	4,839	8.50	186	7,321	39.36	368	35,023	95.17
Nabatieh	956	7,360	7.70	377	14,447	38.32	756	71,114	94.07
Mont Liban	705	8,891	12.61	357	12,295	34.44	505	27,802	55.05
Total	**10,410**	**59,677**	**5.73**	**3,737**	**253,050**	**67.71**	**5,342**	**376,059**	**70.40**

3. **Dairy cattle production systems.** The Lebanese cattle dairy herd is entirely composed of exotic animals which are raised in zero grazing intensive system. However, 3 main types of production systems can be found: (i) the smallholder system, semi-intensive, with 1 to 9 cows, producing an average of 3,750 liters per cow per lactation; in this system, cattle production is often associated with other sources of livelihoods, and marketing of milk mostly follows short and informal channels; This system is found mostly in the Northern and Southern part of the Country, and in Mount Lebanon; (ii) the medium size intensive system (10 to 40 animals) is found mostly in the Bekka and Baalbek; its productivity is fair (more than 5,000 liters per cow per lactation) and the milk is most of the time sold to the industrial processing sector; and (iii) large industrial farms, of several hundred cows, integrated with large processing plants who wanted to secure their production and control their quality. There is very little seasonality of production, due to the feeding system which is mostly based on conserved fodder and

concentrate and is therefore not subject to availability of pasture. The smallholder system is the one where the potential for progress in terms of productivity and milk quality is the highest.

4. **Small ruminant's production systems.** Small ruminant production in Lebanon is mostly focussed on meat production, however milk from sheep and goats contribute 20-25% (21.4% in 2010, respectively 6.2% from sheep milk and 15.2% from goat milk) to the total national dairy production. Milk production from sheep and goats is much more seasonal than from dairy cattle (Mostly from April to June for sheep, and from April to September for goats). Although small ruminants' flocks are generally mixed. Sheep flocks are composed of Awassi sheep producing an average of 60 litres of milk over a period of 90 months (the total lactation period is 180 days but animals are not milked during the first 90 days during which milk is kept for the lamb). Local goat flocks are composed primarily of "Baladi" and Chami breeds (and their crossing), which produce 100 to 150 litres of milk per year (the total lactation period is 240 days during which animals are milked during 150 days). There are three recognized production systems:

   i. "Sedentary farming": this system is often associated with crops; it is common in the Bekka for instance. animals mostly graze on common or public land, but also on crop fields after harvest where they valorize the crop remains; they are also fed on concentrates, and is some cases on cultivated fodder (green cereals and alfalafa);

   ii. "Transhumant farming": these producers are mostly landless and pay a rent for accessing rangelands; herds move up into the mountains for grazing from May to November, where a temporary camp is established., In winter, the diet is based on grazing on communal land, rented land around the villages and on purchased concentrates and fodder; and

   iii. intermediate systems are found in which the quantity of crop residues available in the specific area (e.g. in a village) will lead producers' decision if and for how long accessing pastureland for which he will pay a rent, or not.

5. Mixed production systems: a minority of farmers (10 to 20% in both categories) may raise both small ruminants and cattle. However, animals are kept separately and interactions between the two productions are minimal.

6. Evidence exists that the adoption of an integrated technical package combining feed optimization during late gestation period, preventive healthcare, basic genetic selection and breeding management would result in a sustainable improvement of small ruminant production due to lower costs and higher return per animal head, and higher annual benefit/cost ratio.

7. **Animal feeding.** Animal feeding is the main hinder to the competitiveness of the sector, especially for smallholder producers. Cattle production systems are mostly landless systems and the entire ration (both fodder and concentrate) is purchased from outside The cost of feeding in dairy cattle represents 80 to 90% of the production cost, and 60 to 80% of the milk farm gate price, slightly less for small ruminants. The high cost of feed id mostly due to the fact that, because of the scarcity of agricultural land in the country, most of the animal feed is imported, including part of the fodder (see table 1 below quantities of feed and concentrates produced in the country and imported). Dairy production in smallholder systems is based on the use of "Teben" (chopped wheat straw), which has a negligible nutritional value, and which has to be complemented by very high quantities of concentrate feed (e.g. barley, maize, soya cake etc.) to cope with the production levels. Unbalanced feed diet directly affects rumination which cannot take place properly because of lack of "long" fibres, causing metabolic diseases, rumen chronic acidosis, low milk fat content and low fertility. Surprisingly, very good quality forages (alfalfa hay and maize silage) are available on the market, in sufficient quantities and at reasonable price considering their nutritional qualities. Their adoption by smallholders would allow a substantial decrease in the utilization of concentrates, would increase the production, reduce the production cost, and result in better production margin. This adoption

would require a change in mindset and awareness raising, but could also be boosted by incentives for production of local fodder[13]. Feeding of calves, lambs and kids with natural milk is the common practice and this of course affects the milk productivity. Replacing natural milk by calf/lamb/kid formula could be an option to consider improving productivity and reduce production costs.

Table 1: Production and importation of the main fodder types used in Lebanon for dairy production – gross in tons

Fodder type	Total consumption (tons)	Local production (tons)	Importations (tons)	Average price /kg (LBP)
Tebn and straw (90 % DM)	100,000	45,000	60,000	450
Alfalfa hay (85% DM)	20,000	4,000	15,000	400 to 500
Corn silage (30% DM)	100,000	75,000	25,000	190

Source: Customs and importers/traders
DM: Dry matter

8. **Rangelands and pasture.** The role of rangelands and pasture and their contribution to animal feeding is very marginal in cattle dairy production, where animals are normally kept in integral zero grazing systems and are fed on purchased feed. However, in the smallholder less intensive systems with very few cows, animals are sometimes taken out to graze on marginal lands (road side) in winter. For small ruminants, the contribution of rangelands and crop residues is much more important, especially for transhumant systems. These systems are therefore greatly affected by the rapid urbanization process, which progressively encroaches on pastoral lands, and increases the pressure of this resource and accelerates its degradation.

9. **Reproduction and herd/flock management.** Infertility can be very high in smallholder cattle dairy systems, with inter-calving intervals frequently reaching 18 months. Cows are therefore unproductive during a significant period of their life, which greatly affects the productivity, and increases the production costs. This is likely to be caused by inadequate feeding practices and excess of concentrate in the ration, but also problems of skills and capacities (lack of basic knowledge on reproduction cycle, absence of herd management tools). Milking practices are also not optimal in smallholder systems and cause milk quality issues, including mastitis, that affect the whole value chain; this aspect could be improved by adopting simple hygiene measures at the milking parlour, during handling and on-farm conservation of the milk. The AI sector is working fairly well, on a fully private basis (semen and liquid nitrogen are available throughout the year) and there is no need for the project to support this sub-sector which does not constitute a priority.[14]

10. **Genetics.** in dairy cattle, the genetic potential of animals is high (many animals are imported from Europe or born from imported animals or AI sires) and often underused, other production aspects such as feeding being more constraining. Genetic improvement is therefore not a priority for this project. In small ruminants however, high rate of inbreeding is common, and the performance of animals could be significantly improved, by using improved strains of sheep and goats, that are available nationally (e.g. in LARI[15] research stations) or regionally

[13] Subsidies on production of local fodder could be considered by the Government, as a contribution to the project; subsidies for animal feed used to exist until recently, but they benefited to concentrates mostly, and had a counterproductive effect.
[14] An assessment of the national AI system could however be conducted during the first years of the project, and its outcome considered during the Mid Term Review.
[15] Lebanese Agricultural Research Institute.

(e.g. in Cyprus for Awasi sheep). The use of AI to improve genetic diversity and potential could also be promoted.

11. **Animal health.** Animal health is the second factor affecting productivity of dairy animals. For cattle, FMD[16] is the main threat and Lebanon is engaged in the progressive pathway for control of FMD established by the OIE[17] and FAO, and has reached stage 2 (out of 5 stages, the last one being the eradication of the disease). LSD[18] was absent from the country and has probably been imported with animals coming from Syria. Mastitis are of very high occurrence and negatively affect the milk quality and quantity. It is mainly due to the poor hygiene practices at the milking parlour in smallholder units. For small ruminants, PPR[19] also constitutes a permanent threat, especially in the context of uncontrolled movement at the Syrian border, because of its high mortality rate and its impact on livelihoods. The other production diseases affecting small ruminants are mostly enterotoxaemia and pasteurellosis that lead to mortality rates of lambs and kids of 25 to 40%. Vaccination is the main mean of control for FMD, LSD, PPR and enterotoxaemia.

12. The control of Transboundary Animal Diseases (TADs) is under the responsibility of the National Veterinary Services. The veterinary services regularly undertake vaccination campaigns, sometimes with the support of partners (FAO supported mass blanket vaccination against FMD, LSD and PPR in 2013 and 2014). This is considered as a public good and is thus provided free of charge for farmers. Public Veterinary Services being largely understaffed, vaccination campaigns are organized using contracted private veterinarians and technicians, in the scope of a "sanitary mandate[20]" type arrangement. The main weakness in the TADs control mechanisms remains the surveillance part: there is currently no functional animal database and disease information system, no animal identification system, and capacities if the unique veterinary laboratory are limited. This is a major hinder to the effectiveness of disease control in the country.

13. **Milking.** Portable milking machines are commonly used to milk cows. Generally, farmers obtain a milking machine as soon as they have to milk three or more milking cows. In addition, most of these machines require maintenance and calibration. A well calibrated milking machine will improve cow comfort to maximize milk production. The incorrect pulsation ratio and level of vacuum, in addition to inefficient cleaning, contribute to increased cases of mastitis within the herd that farmers frequently observe (20 to 30%). This in turn affects milk yield and quality. Further to this, farmers that have two milking cows as well as small ruminant farmers (sheep and goats), hand milk their animals. In both cases, simple hygiene practices will enhance the milk quality.

14. **Anti-microbial Resistance (AMR).** anti-microbial agents and in particular antibiotics are used inadequately and residues of anti-microbial agents are found in milk and dairy products, which affects processing, but also indubitably has an impact on public health and resistance to anti-microbial agents.

15. **Extension and capacity building of farmers.** the public agricultural extension network is composed of 31 Agricultural Centers (AC) established at sub-provincial level. These centers are placed under the authority of the Extension and Education Service/Extension Department of the MoA. Most of these centers suffer from recurrent lack of resources, in particular human resources. The number of public extension agents, especially those specialized in Livestock and dairy matters, is insufficient and does not allow the ACs to ensure a proper propagation of technical innovations and knowhow at field level, especially for smallholder farmers who are

[16] Foot and Mouth Disease.
[17] World Organization for Animal Health.
[18] Lumpy Skin Disease.
[19] Peste des Petits Ruminants (Small Ruminants' Plague).
[20] The sanitary mandate is a PPP arrangement under which public veterinary services contract to selected private veterinarians, services related to TADs control which are considered as public good.

not able to pay for private extension services as it is often the case for better off farmers. Other constraints faced by these centers include lack of logistic means, and of training and extension material. Many NGOs, on the other hand, have qualified extension staff but their collaboration with AC is not optimal. This problem of availability of extension services is exacerbated by the fact that the vast majority of smallholder farmers have not followed any technical agricultural training and their technical knowledge about dairying are mostly inherited from the family or neighbourhood. The technical capacity gap seems to be the main reason affecting animal feeding practices, reproduction and milk quality.

Objective and strategic approach

16. In order to improve productivity of smallholder farmers and supply and quality milk, and therefore achieve its outcome, the project will concentrate its efforts on three aspects:

    i. Reduction of production costs: the feeding system generates excessive production costs that affect the profit margin of smallholder and the health of animals; for dairy cows, it is expected that, by using adequate rations with more quality fodder and less concentrate, the production costs should decrease by 30% (Table 1 of Annex 10 shows that, by using an improved ration containing alfalfa hay and corn silage, instead of a traditional ration with only tebn and concentrate, the feeding cost is reduced from LBP 510 per liter of milk, to LBP 350, that is to say by 30% - other benefits on health fertility and longevity of animals are not part of this calculation).

    ii. Improvement of productivity: for dairy cattle, better feeding associated with better management of herds/flocks and reduced impact of animal diseases will result in better productivity of animals. The milk productivity per cow is expected to increase by around 40%. Increased productivity of small ruminants will be achieved mainly through a reduced mortality in young animals through vaccination, systematic control of internal parasites and better feed management, especially during the last phase of gestation and early lactation. Milk production is expected to increase by 20% per lactation.

    iii. Milk quality: better feeding and better hygiene during milking and handling of milk will result in better milk hygiene, which will contribute to improved public health and will facilitate marketing of the milk. Improved milk quality should ultimately result in higher milk price as well.

17. The combination of lower production costs, higher productivity and better milk quality will result in higher profit margins, and better incomes for the producer.

18. To reduce production costs and improve productivity and quality of milk, the project will concentrate its efforts on two types of activities, that have a significant leverage effect:

    i. Improving the technical skills of smallholder farmers, in particular regarding feeding practices, herd management, milk quality and animal health; and

    ii. Reducing the impact of animal diseases on dairy animals, by improving the control of the major animal diseases.

    The combination of these two type of activities should result in a substantial reduction of production costs, increased milk productivity per animal head, and enhanced milk quality.

Description of activities

C. Activity 1.1 - Improving capacities of smallholder farmers

19. **Output,** Technical knowledge and skills of smallholder farmers are improved and contribute to better herd/flock management practices.

20. **Extension.** The project will build capacities of dairy farmers, keeping cattle and/or small ruminants, through the provision of extension and advisory services. Practical training and extension on dairy production will be delivered through the 31 Agricultural Centres (AC -

formally known as Agriculture Extension Centers) of the Ministry of Agriculture, to develop the capacities of smallholder dairy farmers. Training and extension services will in some cases be delivered directly by the ACs, when they have the necessary resources and capacities, but could also be sub-contracted to service providers, such as NGOs with experience and proven capacities in participatory extension for smallholder farmers. Sub-contracting NGOs will be preferred in particular when the AC does not have the capacities to deliver specific services, or for very specialized services.

21. The project will strengthen the capacities of the Agricultural Extension Centres, through provision of equipment and logistics (vehicles, for those that are not equipped yet, computers), capacity building (training of extension staff on participatory extension methodologies, or technical issues related to dairy production, such as animal feeding or preventive health), extension and training material (production of manuals, brochures, leaflets and posters). For those facing shortage of specialized staff, their human resources could be strengthened through recruitment of permanent staff (including at least 30% of women) on contract basis and thereby generate jobs for young specialists and extension agents. These positions will be funded under government regular budget after the project closure, in order to ensure continuation of service provision to beneficiaries. An assessment and mapping of ACs will be conducted during the first year of the project to get a clearer understanding of the constraints they face to fulfill their mission and identify their needs. Finally, a budget will be attributed to each Agricultural Extension Centre to apply and showcase technical innovations.

22. Extension, either by ACs or by service providers, will follow participatory methods, peer learning approaches, on farm demonstration and trials. The project will bring together groups of men and women farmers to engage in an innovative process of hands-on field-based learning over a season/production cycle. The approach followed will aim at strengthening farmers' skills and knowledge for critical analysis, to test and validate new practices to make informed decisions on field management. It will also aim at enhancing group cohesion of participants to better work as a group and build the potential basis for more sustainable economic interest groups (milk collecting groups or cooperatives for instance).

23. Extension and advisory services will cover technical, managerial and financial issues. Training and extension for smallholder cattle dairy farmers and small ruminant farmers could be distinct. For cattle dairy production, training and extension will target a large range of subjects including but not limited to: (i) animal nutrition and use of quality fodder to reduce production costs (this will be the primary focus of all extension activities), (ii) milk handling and hygiene, including control of mastitis, and prudent use of anti-microbial agents such as antibiotics to prevent anti-microbial resistance (AMR), and (iii) husbandry practices and management of reproduction cycle. For small ruminants, the issue of animal health and prevention of production diseases such as enterotoxaemia, pasteurellosis, and internal parasites, will be one of the priority topics. Genetic improvement of small ruminant's flocks will also be addressed through extension and awareness raising, and demonstration/pilots of AI and introduction of improved rams/bucks. The extension package will also address other subjects such as human nutrition, household economy, and gender. During the group discussions, a specific attention will be given to discuss the benefits of producers' groups including cooperatives and the opportunities offered by the project to develop climate-smart investments.

24. A separate extension module on forage production will be developed and administrated to both farmers who own land and wish to produce their own fodder, and farmers who don't belong to the primary target group because but wish to produce fodder on a commercial basis.

25. Smallholder dairy farmers will constitute the priority target group for extension activities. However, considering the crucial role of farm assistants in the management of dairy farms, and their skill deficit on technical issues such as animal feeding, milking hygiene or

management of reproduction, they will be involved in extension activities too. Specific modalities will be established to enable farm assistants to attend group sessions and overcome reluctance of their employers to release them from work to attend for training sessions.

26. **Technical and Vocational Educational Training (TVET).** In order to build capacities of youth, local or refugees, in the dairy value chain, the project will build synergies with the project "Upgrading the Technical Agriculture Education System in Lebanon", funded by the Dutch Government and implemented by FAO. HALEPP will select in collaboration with the FAO project the participants in the training programme among HALEPP target groups, and provide support to the FAO project for the development of specialized curricula for dairy production and processing, to ensure their alignment with project priorities.

D. Activity 1.2: Improving the animal health status of the dairy herd and flock

27. The influx of livestock (mostly small ruminants) entering Lebanon with Syrian refugees has created an additional logistic and budgetary burden on national veterinary services, for surveillance and control of animal diseases, in particular Transboundary Animal Diseases (TADs) which have the potential to rapidly spread over borders. The project will support the Veterinary services to cope with this additional burden. Specifically, the project will support the implementation of disease control programmes against three major TADs which are (i) FMD (for all ruminants), (ii) LSD (for cattle), and (iii) PPR (for small ruminants).

28. The support provided by the project will have a national coverage and will focus on 5 sub-activities:

    i. Revamping the National Animal Disease Surveillance System (NADSS), an integrated surveillance system and animal health database which has been established in the past with the support of FAO but is not operational: the project will provide equipment (server and computers), facilitate the revamping and upgrading of the software and make it more user friendly, powerful, and compatible with international standards and systems.[21] The project will also support the training of users at central and regional levels on the use of the system, and facilitate the maintenance of the system and data entry through a PPP arrangement (recruitment of a private service provider for data entry), in the absence of dedicated trained staff at the Ministry;

    ii. Supporting identification of dairy cattle (creation of database and ear tagging) to facilitate surveillance and traceability (identification of small ruminants is not foreseen at this stage under this project, because of its costs and implementation challenges);

    iii. Providing laboratory kits for active and passive surveillance of the three targeted TADs;

    iv. Supporting logistics for surveillance, vaccination and monitoring activities: the project will purchase cars for vaccination and surveillance activities, as well as a central server and computers for the information system; and

    v. Supporting PPP arrangement for disease control (vaccination and surveillance): the project will support contracting private veterinarians and para-veterinarians in the scope of formal "sanitary mandate" agreements, to cope with the problem of understaffing of public veterinary services.

29. The cost of purchasing vaccines will be supported by Ministry of Agriculture. Vaccination against TADs and identification of cattle is considered as a public good and will be provided for free. This support will be complementary with the institutional and capacity support provided in the scope of the EU funded "twinning" project, which will facilitate twinning and transfer of competences between the National Veterinary Services (VS) of an EU Member State (to be selected) and the Lebanese VS.

[21] National Animal Disease Information and Surveillance Systems need to be compliant the World Animal Health Information System (WAHIS), managed by the OIE, in order to comply with transparency requirements of the WTO SPS agreement.

Implementation arrangements

30. The activities under this component will be implemented through the following arrangements:

    i. Training and extension services will be either delivered directly by the ACs, or sub-contracted to service providers, with experience and proven capacities in participatory extension for smallholder farmers. These service providers will be recruited through a competitive process, and will work under the joint supervision and control of the Extension and Education Service and of the Directorate of Animal Resources of the MoA, which will ensure quality control, coordination, and alignment and compliance with policies and regulatory frameworks. Animal disease control will be implemented by the National Veterinary Services. In addition, the Veterinary Authority will subcontract private veterinarians and technicians to assist them in that task, in the scope of a "sanitary mandate" arrangement that the project would also support. Private sub-contractors will also be selected through calls for proposals. The animal feeding component, including fodder cultivation activities, will be scientifically and technically coordinated by a mentoring organization that will be responsible for the diffusion of technical innovation and will ensure the consistency and quality of the extension package. The first activity that will be implemented by this service provider will be an assessment of the fodder and feed "value chain", including quality aspects. The American University of Beirut, and ICARDA, who have a good experience in this domain, could be contracted to play this role.

Component 2: Improving small-scale value addition and access to market

31. The expected outcome of this component is improved nutrition through increased consumption of dairy products, better quality dairy products at the household level, strengthened and competitive small and mid-size dairy processors, and reduced post-harvest losses of milk. This will be achieved through training of producers and processors in best practice. The outputs will be structured under two subcomponents.

Background and Rationale

32. The Dairy sector in Lebanon has a long tradition and history in dairy processing. Many traditional products are produced and there is an unmet demand throughout the country. The total milk produced in the country in 2014 was 391,800 tons per year (FAO statistics, 2014). The Bekka valley, known also as Lebanon's dairy basin, produced 30 per cent of the countries milk from cattle and 60 per cent of the small ruminants' milk. Table 1 presents milk produced in 2010 as calculated from the Ministry of Agriculture census 2010[22] and FAO statistics.[23]

33. The demand for dairy products in Lebanon is high, with a level of consumption per capita of 114 liters per year and per capita (FAO, 2013). The national total demand has been boosted by the influx of refugees from Syria, where the level of consumption of dairy products, especially traditionally processed, is high.

34. In the country there are 276 dairy processing plants with different capacities (Table 2).[24] However, most of the produced milk is processed through the semi artisanal small scale processing sector (Lebanese Dairy Board, 2016).

[22] Resultats Globaux du Module de Base du Recensement de L'agriculture 2010, http://www.agriculture.gov.lb/html/RESULTATS_RECENCEMENT_AGRICULTURE_2010/RAPPORT_RESULTATS_GLOBAUX_DU_RECENCEMENT_2010.pdf
[23] FAOSTAT, Food and agriculture data, http://www.fao.org/faostat
[24] Information from the Ministry of Agriculture.

Table 2: Distribution of dairy processing units in Lebanon

Governorate	Number of Dairy Processing Units
Mount Lebanon	75
Bekaa	103
Baelbak Hermel	34
Akkar	9
North Lebanon	26
South Lebanon	19
Nabatyeh	10
Total	**276**

35. In spite of the support and services provided by past dairy improvement programs and projects that include those of the FAO, USAID and others, processors are still confronted with challenges associated with the quality of milk and its hygiene.

36. **Milk collection**, handling and transportation often lack adherence to basic hygienic rules. For example, milk from animals presenting mastitis and milk from antibiotic treated animals are mixed with bulk milk indicating clear issues of implementing simple regulation rules at the farm level. Furthermore, awareness and adopting simple hygiene procedures such as using proper utensils and cleaning procedures will increase milk quality and its processing characteristics. In spite of past projects on dairy (i.e. FAO), that distributed inox milk cans, aluminum and plastic cans are still used and have been found to be difficult to clean to a level of hygiene that is required. Generally, the produced milk is provided to the processing units directly by the farmers or collected by the processors. However, in Bekka valley milk is mainly channeled through a milk collector “Hallab” who adds a profit of 100-200 LBP[25] for his service. Milk is cooled when it arrives at the processing units, but not on-farm or during transportation. Several small ruminant farmers and a large proportion of small-scale dairy cattle producers, especially in remote areas, process directly their milk into yogurt and yogurt-based derivatives.

37. The main constraint faced by farmers are the low milk prices that vary from LBP 600 to 850 and a few farmers achieve LBP 1,100. No price difference is between small ruminant and cow milk. In a few cases small ruminant milk is sold for LBP 1,100 or more. However, milk prices are very much affected by the prices of imported milk powder which add an additional pressure on producers to reduce their milk prices.

38. **Dairy processing** is one of the most important activities practiced in Lebanon. The main products include Laban, Labneh, Shanklish, and different types of local cheese such as Baladi, Akkawi and Halloum cheese. The obtained yields in processing varies depending of the type of cheese (see table 4 below). In this regard, the project can provide processors the means to enhance product yield that will have a positive impact on incomes. Moreover, prices at the processors gate varies from place to place and also depends on reputation of the processors or producer. A list of price variation is presented in Table 4.

[25] 1USD = 1,494 LBP, https://www.oanda.com, accessed 16-02-2017.

Table 4: List of cheese prices and their yield obtained by household's producers and dairy processors

Product	Yield (per cent)	Price (LBP)[26]	
		Min	Max
Akkawi	1	10,000	14,000
Baladi	16	8,000	12,000
halloum	14	10,000	25,000
Laban	100	1,400	3,000
Labneh	40	8,000	11,000

39. The equipment used in dairy processing by household producers are normally aluminum big puts and a normal gas heater. Most of these units have a cooling facility to store their products. Whereas, the main equipment used at a dairy processing units consists of milk cooling tanks to store milk, stainless steel cheese vats, cheese press and cooling facility to store products. Some dairies are equipped with a vacuum packager to package cheese. Cheese vats in many cases are not well finished, welding points and lines are rough and wavy forming dead points difficult to clean well. In many cases a well ventilation and drainage is lacking. Depending on dairy processing capacity, milk thermal treatments depends on direct gas heating or on vapor generated by boilers.

40. Dairy processors are facing the problem of milk quality which affects the quality of the end product and its characteristics. Inadequate hygiene procedures at milking and during transportation are the inherent cause. The majority of household producers and small dairy processors do not produce cheeses due to marketing opportunities or in some cases due to knowledge gaps. On the other hand, mid-size producers are processing Baladi cheese to overcome the problem of Anti-Microbial Residues (AMR), in yogurt processing, mostly due to the inadequate and excessive use of antibiotics. Moreover, some cheeses are marketed without any adequate thermal treatment exposing consumers to infectious and zoonotic diseases like Brucellosis. Many dairy units need to improve their hygienic procedures and infrastructures to comply with basic prerequisite standards. Additionally, many small processing units are operating without a license or/and without obtaining health certificate.

41. Generally, dairies can be classified into modern, semi-modern and traditional dairies, where the latter are the most numerous. some of these dairies are combining and integrating livestock, milk production and dairy processing. in this regard, the project supports the cooperation between a producer and a processor at a special level of milk volume to enhance work focus and increase productivity.

42. **Quality control of milk and dairy products.** The current lack of quality control of raw milk and dairy products at small and mid-size dairy processing unit is a major impediment to growth of Lebanese dairy sector. There is a need to promote and regulate a marketing and pricing system for quality milk that is based on fat content, physical attributes, bacteriological and antibiotic residue analyses.

43. **Marketing.** Constraints on market access, such as weak infrastructure, lack of rural trade networks and absence of market information, result in low prices and consumption-oriented production. Links between producers, processors/traders will ensure continuous market access, value addition and optimum prices.

44. **The knowhow and capacity building.** Producers and processors have adequate knowledge in processing traditional dairy products. However, small producers and laborers in this sector did not receive technical training on processing and they are not sufficiently exposed to

[26] Prices indicated here are indicated and may vary more according to seasons and regions.

information on hygiene. The poor knowledge, technical issues and the lack of the basic hygiene procedures in processing affect the product quality and quantity. Establishing different training modules including training of trainers (ToT) on hygienic milk handling and processing is essential to supply the market with high quality and safe products.

Objective and strategic approach

45. The overall objective would be to increase the income of household producers and dairy small scale and mid-size processors by improving on-farm and off-farm processing productivity, increasing value addition, enhancing product quality and facilitating access to market.

46. **On processing**, the project will focus on improving hygiene procedures in milk handling and processing, reducing losses through the value chain particularly during processing, enhancing the dairy processing yield through better controlled processing environment, which will result in better performance of the processing stage. These improvements in processing performance will require to enrich the knowledge of household producers and improve the technical skills of the processors in particular on ways to reduce losses and enhance product yield. with particular focus on women and youth. The project will also support access to processing and quality control equipment.

47. **On market access.** Taking into consideration the dairy industry characteristics and the potential of the small and medium processors, several marketing options were assessed by the design team. Market penetration where there is a strong competition from large industrial processors and imported products will not be considered feasible given the limited financial and managerial capacities and bargaining power of the small and medium processors. Consequently, the most suitable marketing strategy is to focus on a parallel market through a combination of the following options:

    (i) targeting local markets close to the production and processing sites where fresh bulk milk and traditional dairy products are most preferred by the local consumers; and

    (ii) targeting the emerging urban niche markets for upmarket authentic and natural products through adaptation of small and medium processors products to better quality, safety, competitive prices and eventually creation of a quality label. The primary focus will be on products that are the most familiar to consumers, such as laban, labneh, kishk. It would be followed at a later stage by the promotion of new products, which may offer better possibilities for fast growth.

48. The proposed marketing strategy would require aggregating the dairy products of smallholder producers and processors to access and compete in markets at significant economy scale. Experience in other countries clearly indicates that the cooperatives would be the most appropriate mode of product aggregation. Solid and well managed cooperatives would allow their smallholder producers and processors to diversify into value addition and convert raw milk into processed dairy products. Despite such high potential, the cooperatives in Lebanon are not in a strong position to service their members. In addition to their weak financial situation, their staff and board members lack managerial skills and interaction between the management and the members. The project will therefore improve the functionality of selected cooperatives through support at various level: improved governance, enhanced management systems, and strengthening of capacities of members, staff and leadership.

49. **Output.** The knowledge and awareness on hygiene of smallholder producers are improved; the technical skills of processors are improved, quality control and hygiene practices are implemented; capacities of cooperatives for aggregation and access to market are improved.

Description of activities

3. Sub-component 2.1: Supporting aggregation and value addition

Activity 2.1: Improve capacities for on farm dairy processing

50. The objective is to enhance the capacity of household producers mainly women as they undertake milk processing activities through special training program. The project will assist dairy farmers to produce improved quality products that will increase their income. A training program will be designed to increase awareness on milk hygiene, handling and processing focusing on women household members in charge of milking animals and milk processing at home. The focus will be on the introduction and use of simple innovations and technologies that results in higher yield and improved quality products.

51. The project will target 1,500 cattle and small ruminant household producers over the project life span where 60% of the beneficiary will be women and 40% men. these household producers will be identified through the preliminary targeting exercise.

52. The project main support consists of providing the stallholders producers with 2 milk cans per household to handle milk in a hygienic way and to maintain the quality, and intensive training on milking and milk handling and processing.

53. The project will focus in the first year on preparations and developing of training modules. The training modules will make use of available material that includes what was developed by other organizations in the country and in the region on the same topic. Training material will include guidelines to help on farm processors to comply with existing regulations related to hygiene, milk quality and safety. In addition, training of trainers (ToT) will be conducted in the first year to produce 10 qualified trainers in milk processing Out of these 10 trainers, at least four should be women. These trainers will conduct the trainings of household producers and will provide follow up.

54. The project will conduct in total 14 training sessions per year covering the seven governorates aiming to train 300 beneficiaries per year. A total of 1,500 household producers will be trained. Each beneficiary will receive a training kit consisting of an alcoholic thermometer and a pouch of dairy culture. The trainers will contact the trainees twice to provide needed information and maximize the benefit.

55. In addition to the initial off site training programme, an on the job coaching and mentoring programme will be implemented. The trainers will visit the trainees twice a year in average to support the application of the newly acquired skills and provide technical backup.

Activity 2.2: Improve capacities for off-farm dairy Processing

56. The objective of this activity is to enhance processors skills in dairy processing and management of processing units to produce high quality products. This objective will be achieved by implementation of a set of procedures to enhance hygiene and increase product quality.

57. The project will target 80 processors where 40 have a daily capacity of up 200 liters, the other 40 targeted processing units will have a daily capacity of up to 2,000 liters. The focus will be on quality control, and improved processing methods and product labelling. Packaging and branding will help producers to better access markets and capture the additional added value.

58. **Training**. A training program and on-demand assistance and advisory mechanism will be set to cover aspects needed by producers to fulfil consumer demand. Market information, network and market oriented processing will secure small and medium size processors and producers income and open opportunities to expand and upgrade dairy businesses.

59. In the first year of the project implementation, a training module will be developed and publications such as booklets and fact sheets will be produced. Training material will include guidelines to help on farm processors to comply with existing regulations related to hygiene, milk quality and safety. In addition, the required materials to successfully organize trainings will be purchased.

60. The training module will cover different areas that include milk composition, microbiology and quality control. The training program will have a strong milk processing component. The training will enable processors to produce high quality products that meets Lebanese standards and regulation norms.

61. The project will conduct eight training sessions in the second year each session will be attended by maximum of 10 beneficiaries. A further training module will be provided to successful dairy processors in the 4th year. This training will focus on dairy product diversification. The training will provide processors with additional options to increase their income through targeting marketing niches. A follow up program will be developed to and income. Four follow up visits per processing unit per year will be carried out and documented.

62. In addition to the initial off site training programme, an on the job coaching and mentoring programme will be implemented. The trainers will visit the trainees four times a year in average to support the application of the newly acquired skills, ensure that processors are in the right track to improve their products and provide technical backup.

63. **Quality Enhancement**. In addressing the gap of milk quality control, HALEPP will provide support to implement a simple milk quality control system. Small size dairy processors will be trained and equipped to check milk for acidity, and EC to detect mastitis milk, and kits to detect residues of Anti-Microbial substances. In addition, the mid-size dairy processors will receive additional training and equipment to analyze milk component including adding water. Both types of processors will be able to detect antibiotic residues in milk that affect product quality and contribute to anti-microbial resistance.

64. The project will provide different kits to control the quality of received milk. The first kit will consist of a thermometer, a portable combined pH/EC meter and a set of dairy cultures to produce yogurt and cheese. This kit will be provided processing units with a daily capacity of up to 500 liters. The second kit, for bigger units, will consist of a simple milk analyzer, a portable combined pH/EC meter, a thermometer and a set of dairy cultures for the production of yogurt, yogurt based products and different types of cheese.

Activity 2.3: supporting access to market

65. **Marketing study.** In addition to capacity building, and in order to promote processing and marketing of high value dairy products, project support would include a study on “Dairy Products Diversification and Marketing” to be carried by a dairy marketing specialist in year one of project implementation. The study would identify the most efficient way of enhancing smallholder’s producers and processors access to market. The study would focus among other things on products and sales promotion, supply management and distribution networks

66. **Development of a quality label for Lebanese cottage dairy products.** The project would contribute to enhancing market access for high value quality traditional dairy products, targeting the emerging and fast growing market niche for authentic and natural Lebanese dairy products. Lebanon has an important know-how in the manufacturing of typical national dairy products which are part of the national cultural heritage. These products even benefit from a strong consumers’ recognition but do not have an official quality label framework which protects them from industrial or imported products, and guarantees their “quality” and “safety”. The project will therefore support the development of a quality consensus-based label for cottage dairy products, which could eventually lead to the establishment of a "Controlled Designation of Origin" framework. This framework will in particular include the specifications

for production of milk, its processing, packaging and marketing. Theses specifications will be established in consultation by all the value chain actors that would be interested in producing the labelled range of products. This process could be initiated under the National Consultation platform, under the authority of which an inclusive quality label "working group" could be created to lead the process. Project funds will be allocated for (i) developing draft specifications, (ii) facilitating the consultation process among value chain actors (operations of the working group), and (iii) promotion of the quality label and related products and awareness campaigns on role of dairy products in human nutrition.

67. **Support product aggregation through improved functionality of cooperatives.** As mentioned earlier in the PDR, only one third of the existing 1,200 cooperatives are functional. Following the base line survey in year one, the project would select around 50 of the most genuine and member-driven dairy cooperatives[27] to provide them with necessary capacity building at three levels: (i) at members' level, to enhance capacity of members to exercise effective checks and balances over the governance of their cooperative, (ii) at management level, to enable cooperative managers to combine the skills of an effective business manager with those of an efficient service provider. and (iii) at employees' level, to make cooperative staff technically capable but also more proactive to better respond to the requirements of the market and the needs of the members. The training curricula will cover various aspects including governance of cooperatives, management including financial management, commercial aspects and marketing.

Activity 2.4: Renewable energy

68. The dairy sector is susceptible to climate change both on the production and marketing sides, as water becomes more limited for fodder production and as temperatures increase requiring changes to forage feeding systems. Temperature increase also makes the transport, safe storage and processing of milk in the supply chain to consumers more complex and with growing energy use requirements. On the other hand, dairy farming is also a contributor to climate change as increases in dairy production may contribute to anthropogenic Greenhouse Gas (GHG) emissions and biophysical degradation and potential loss of biodiversity if green strategies are not promoted along with good dairy management practices. Reducing GHG emissions is not always easy and steps have to be taken to reduce energy consumption in the dairy sector by applying energy-efficient measures based on the use of renewable energy sources and emphasizing the need for careful management of energy use.

69. Manure management: a dairy cow produces on average 15-30 kg of manure per day. Practical and environmental issues associated with emission of large amounts of manure are a major set of issues that need to be addressed in dairy development. Inappropriate on-farm manure management impacts on cow health and productivity, contributes to environmental pollution at local scale, as well as Greenhouse Gas (GHG) emissions. The 2015 "National greenhouse gas inventory report and mitigation analysis for the agriculture sector in Lebanon" authored by GEF, UNDP and the Lebanese Ministry of Environment states that in 2012, total GHG emissions from the agriculture sector in Lebanon amounted to 876.51 Gg of carbon dioxide equivalent (Gg CO2eq.). In particular, the sources of GHG emissions from agriculture and their relative contributions were: nitrous oxide (N2O) emissions from agricultural soils (55%), but also methane (CH4) emissions from enteric fermentation of domestic animals (23%), and nitrous oxide and methane emissions from inadequate manure management (22%).

70. A mentioned above, enteric fermentation is a major source of emissions within the agriculture sector. Cattle (mainly dairy) represented 62% of emissions while 34% is from sheep and goats. Feed optimization has been identified as and effective mitigation measures to reduce

[27] A mapping and assessment of dairy cooperatives will be done in the first year, using as reference the ongoing inventory and assessment of all cooperatives being undertaken by the General Directorate of Cooperatives.

GHG emissions from dairy cattle and small ruminants. The inappropriate management of manure is also significantly contributing to GHG emissions. In 2012, nitrous oxide emissions and methane represented respectively 80 and 20% of total emissions from manure. Dairy cattle are the largest contributor to methane emissions from manure management, followed by non-dairy cattle, and poultry. However, biogas (mostly methane) produced by manure fermentation would be an excellent renewable energy source which would reduce rural household expenditures on energy and chemical fertilizers. In the context of HALEPP, biogas production would contribute reducing the cost of dairy processing at home level, while use of biogas slurry as fertilizer can increase crop yields. Manure treatment through anaerobic digestion for the production of biogas and composting are potentially beneficially for smallholder producers.

71. Milk collection and processing: milk is almost sterile when secreted from a healthy udder. The natural inhibitors in milk (e.g. lactoferrin and lactoperoxidase) prevent significant rises in bacterial numbers for the first three to four hours after milking, at ambient temperatures. Cooling to 4°C within this period maintains the original quality of the milk and is the method of choice for ensuring good-quality milk for processing and consumption. But cooling can only work with electricity and the country suffers from frequent electrical power cuts, especially in rural areas. Diesel generators and milk storage are expensive and not affordable for smallholder producers. The utilisation of photovoltaic panels would be a viable way to ensure a more stable access to energy. Equally important would be the application of solar energy technology to satisfy small-scale dairy processors' growing needs for heating (milk and water) during their operations.

72. Lebanon relies essentially on oil imports as its main resource for energy production. The promotion of low-carbon energy sources to replace fossil resources has therefore gradually become of a high priority for Lebanese Government authorities. In the 2009 Copenhagen Climate Summit, the Lebanese Government made a pledge to develop Renewable Energy (RE) production capacity to reach 12% by 2020. In this context, the Ministry of Energy and Water (MEW) through the "National Renewable Energy Action Plan for the Republic of Lebanon (NREAP 2016-2020)" has defined a policy framework and strategic initiatives to achieve the above mentioned objective. The initiatives 7 and 9 are specifically aiming at supporting electricity generation from (i) solar energy; and (ii) geothermal, waste-to-energy, and other technologies. Unfortunately, there are very few example of renewable energy applied to the dairy sector in spite of a rather wide availability in Lebanon of technologies offered on RE by the private sector.

73. The project will address issues related to the impact dairy production mainly through supporting farmers to change farm management practices, especially livestock feeding, through extension in ways that reduce methane emissions (see Component 1). It will also support capacity building for extension service providers in delivery technical advices on manure management to avoid pollution of soils and waterways, and biogas promotion will include technical advice on appropriate use of biogas slurry as a fertilizer and improvement of soil health, thus reducing use of chemical fertilizers.

74. In order to assist target group in reducing energy cost and to explore opportunities for RE private sector's engagement, the project will support three models using renewable energy in the dairy sector.[28]

    i. **On farm milk cooling technology using solar energy.** Cooling milk on farm to maintain the original quality after milking is the method of choice for ensuring good-quality milk for processing and consumption. At present, cooling equipment is expensive for smallholder producers, unavailability and/or unreliable electric power supply are factor deterring on-farm cooling. The recent progress and reduction of costs

[28] http://www.fao.org/docrep/003/X6541E/X6541E00.htm#TOC

of the photovoltaic technology offers the possibility to develop affordable equipment which would guarantee a constant supply of energy.

ii. **Solar energy water heating for milk processing.** The high cost of electricity for heating water for dairy processing and the frequent electric power cuts affects the profitability and efficiency of small dairy processing units. By piloting solar panel units to heat water for processing, the project intends to demonstrate the economic benefits in a country characterized by a climate with high levels of solar radiation.

iii. **Biogas production from dairy cattle dung.** The lack of management of excreta (dung and urine) from dairy cattle farms causes severe environmental problems and, in the context of rapid urbanization, complains by the residents near the farms. The objective is to introduce smallholder dairy farmers to a system of collection of manure, capture of Methane for combustion purposes (e.g. on-farm pasteurization, yoghurt production, on-farm cheese processing etc.) and utilization of "bio slurry" for agricultural purposes (i.e. vegetable, fruit and plant production). It will build on IFAD experience with the "portable biogas" technology. Eventually, biogas for milk cooling purpose would be tested as a standalone technology or in association with solar energy.

Implementation arrangements

75. **Training for on farm and off farm processing, and training of cooperatives.** The trainings and on the job coaching for on farm and off farm processing, as well as the training of cooperatives and marketing support will be conducted by local NGOs or other institutions that have the capacity and knowledge, and proven records in similar activities, and which will be recruited through calls for proposals. As far as training and coaching of cooperatives is concerned, NGOs specialized in marketing support and cooperative management[29] will be identified and sub-contracted.

76. **Development of a quality label for Lebanese cottage dairy products** will be implemented by a dedicated committee established under the dairy stakeholder platform, supported by a specialized service provider / NGOs (e.g. Rural Delights, who has a good experience in this domain, Food Heritage…) and working under the guidance of the Platform and the Directorate of Animal Resources.

77. **The renewable energy pilot activities** will be implemented by institutions with appropriate expertise, such as universities or research organizations, selected through call for proposals to select the best qualified and cost effective service provider.

Sub-component 2.2: Improving access to finance

Introduction

78. Financial institutions (FIs) in Lebanon –commercial banks and microfinance institutions - are generally well-managed, have extensive geographic footprints, enviable operational performance, and ample capital for on lending. Most agricultural lending (estimated at 10% of all FI loan portfolios) targets large agro-industry, and most smallholder households have little, or no access to capital. This said, the smallholder market, particularly in the dairy value chain, with its constant revenue, represents a good market for FIs. They face several constraints to lending, however, including: poor understanding of the dairy sector, inappropriate products, high transactions costs, and inaccurate risk analysis resulting high interest rates. For smallholders, constraints include poor knowledge of credit, fear of banks, preference for grants, and, for some, religious objection to interest.

[29] Such as Rural Delights, René Mowad Foundation, Food Heritage, etc.…

79. **Financial sector development activities.** Private sector partners (PSPs) require incentives to enter markets as well as attractive long-term profits to remain in them. Good market analysis demonstrating commercial viability is required. The private sector also requires cost-sharing to ensure long term partnership commitments. In lay terms, this is called having "skin in the game" or that the FI has substantial time costs and capital at risk to prove their commitment and justify receipt of programme resources. The proposed subcomponent activities ensure FI "skin in the game" through the risking of their own capital in pilot project loans. Good practice financial product design also requires an understanding of client needs which can be capture through a Human Centred Design (HCD) approach recognizing the centrality of client needs.

80. **Financial sector programme activities.** Financial sector programme management requires strong technical expertise to: (i) attract and assess the capacity of partner institutions; (ii) monitoring/evaluation partner performance; (iii) source capable technical assistance for partner institutions; and (iv) support ongoing programme/ field team training and development. Short-term/sporadic TA is often insufficient and long-term commitments must be made to ensure consistency and availability of supply. PSPs can be highly sensitive to timing issues, making planned flow of funding critical for both FIs and potential borrowers. Financial programmes also require a technically capable and intensely engaged manager. Without good oversight, programming can fall behind the relatively fast-paced expectations of FI private sector partners, causing them to lose interest, not meet performance goals, or find other more profitable ways to spend time and capital.

Rationale and justification

81. Formal financial sector interest, particularly in commercial banks, in rural smallholder household market is an important development issue, not only for taking advantage of dairy value chain enhancements, but for creating an efficient rural financial services market generally. PSPs require incentives to enter markets as well as attractive long-term profits to remain in them. Good market analysis demonstrating commercial viability is required. Greater access to credit will lead to greater use by lower income households of a range of beneficial financial products and services, including savings and insurance, which will improve household and enterprise productivity and asset development, resulting in poverty reduction and a more vibrant rural economy. Targeting and supporting the needs of women will support equitable and sustainable use of credit within households.

Outcomes and Objectives

82. Subcomponent **outcomes** are to increase formal financial sector lending in the dairy sector and to increase income to smallholder households in pilot loan programme. The **objective** of this subcomponent is to demonstrate the viability of sustainable inclusive finance in the rural smallholder dairy market.

Description of Activities

83. To address the constraints noted above, and to stimulate lending in the dairy sector, the programme will work with FIs and dairy smallholders/value chain stakeholders to develop interest in dairy loan product/lending. A product will be developed and tested by three to five FIs selected on a competitive basis with technical support from the programme. In association with the project extension activities, smallholder dairy farmers will be supported with the basic business management skills required for loan applications and credit repayment. Similar support will be provided to small dairy processors. The programme will also fund the Lebanese Microfinance Association to produce an assessment inclusive (pro-poor) financial services in rural areas, as well as a study on innovative approaches to micro-insurance for rural areas generally and dairy value chain particularly. Both of these studies should be sponsored by a national organization, with strong vested interest in the development of

inclusive finance, excellent technical capacity in good practice inclusive finance, and able to ensure broad sector representation, wide distribution of/dialog around the studies (e.g. the LMA).

84. This subcomponent has three activities to stimulate lending and improve credit access in the smallholder dairy sector.

85. **Activity One: Sustainable dairy loan product.** This activity will support the creation of loan products directed at cow and goat/sheep milk production and processing among program beneficiaries, specifically, and the sector more broadly. The objective of this activity is to improve FI risk assessment of milk production and processing as a lendable economic activity, resulting in lower transaction costs and loan interest rates. It has two steps: (i) a Workshop on dairy sector lending to be convened and hosted by an organization representing the inclusive financial sector and able to legitimately convene a broad number of stakeholders. The workshop would stimulate interest by FIs to develop and test a dairy loan product, and (ii) a Dairy Loan Product Development to provide support to three to four FIs willing to develop a dairy loan product(s)[30]. Selected FIs will receive technical assistance to create dairy loan product(s) of their own or in association with other financial institutions. For the new loan product or testing, HALEPP will provide a modest amount of funding, while each FI will match with their own capital on a negotiated basis (e.g., 60:40). The objective of this step is to stimulate sustainable risk to interest rate appropriate lending to the dairy sector.

86. **Activity Two: Smallholder financial literacy.** This activity will support smallholder dairy producers and processors access to credit through the provision of basic enterprise training and support for loan application processing (for beneficiaries interested in taking a loan). The activity will be integrated into the extension package and will be implemented by a competitively selected technical assistance supplier (e.g., ADR, Economic and Social Fund for Development). The objective of this activity is to increase the confidence and capacity of smallholder's access to credit and develop relationships with formal financial institutions. The activity will also inform FIs of the full transaction cost to the FIs for the pilot period and inform further product development.

87. **Activity Three: Rural Finance Intelligence.** This activity will support the development of inclusive rural finance in Lebanon generally (including the potential for a national rural finance policy), and rural and dairy inclusive finance specifically. It has two activities: (i) the first comprehensive assessment of rural finance in Lebanon through an extensive analysis of both the supply and demand of finance in rural area generally, and through an extended case study of the dairy value chain, specifically. The objective of this activity is to provide market information to rural finance stakeholders and a platform for informing potential rural finance policy considerations by the Government of Lebanon; and (ii) support a market analysis for the potential of micro insurance in rural areas, with a case study focus on insurance products for dairy sector (smallholder milk producers and processors).

Implementation Arrangements

88. The PD will not have capacity or the funds to manage this subcomponent and to ensure good practice inclusive finance implementation. IFAD experience recommends the most effective and efficient means to manage appropriate sourcing, contracting, oversight/monitoring and evaluation capacity is to contract an independent third party. The third party would have the following characteristics: (i) strong technical capacities in inclusive rural finance; (ii) legitimacy within the inclusive financial sector to convene broad stakeholder group; and (iii) have a long-term interest in the development of the inclusive financial sector (e.g., the LMA). The

[30] Animal feeding has been identified earlier as a major impediment to productivity and competitiveness of the sector, and a loan product addressing this constraint should be developed in priority, to enable farmers to purchase quality fodder in bulk, at reasonable price.

independent third party organization will be responsible for convening and hosting the Workshop on Dairy Lending. The PD will work with the independent third party organization to design a competitive selection process and TOR for FIs. Selected FIs will be responsible for developing and pilot testing the dairy loan and dairy processors loan product(s). The third party organization will also source, support, monitor, assess and approve output of consultant/s undertaking the assessment of inclusive rural finance and the micro-insurance study.

89. **M&E indicators, including outputs and outcomes.** The outputs of these proposed activities are: (i) Workshop on Dairy Lending to attract FIs programme participation; (ii) development and pilot testing of dairy loan products at three to five FIs; (iii) minimum of 75 loans piloted to dairy farmers, with 35% to women; (iv) minimum of 10 loans piloted to dairy processors, with up to 75% to women; (v) comprehensive assessment of inclusive rural finance in Lebanon, with case study on smallholder dairy financing; and (vi) comprehensive assessment of the potential for micro insurance in Lebanon, with case study on smallholder dairy micro insurance.

Sub-component 2.3: Supporting a dairy stakeholder platform for inclusive policy dialogue

Background and rationale

90. There is a need for more inter-stakeholder dialogue in the dairy sector, in particular to address issues of price equity along the value chain, milk quality, as well as regulatory and policy aspects. The industrial processing sector is the only category of stakeholders to be organized at national level in the Lebanese Dairy Board.[31] Other categories such as smallholder producers or small-scale processors are not organized, their lobbying and advocacy capacities are very weak, and their voice can hence hardly be heard at decision makers' level. The Ministry of Agriculture has recently initiated a more inclusive process, called "National Milk Committee" convening stakeholders' fora to discuss various issues concerning the dairy sector, including milk price. The project will further support and consolidate this MoA's initiative ensuring a regular frequency in the organization of these fora, and facilitating smallholder farmers and small scale processors participation.

Outcomes

91. This activity will have three main outcomes: (i) an inclusive national policy dialogue platform is established/strengthened and plays an active advocacy role for the interest of the smallholder dairy sector; (ii) 7 regional innovations platforms are established, address technical constraints at local level and ensure upward flow of information; and (iii) consensus based self-regulation mechanisms (for quality, price…) are established.

Description of the activity

92. At national level, the Directorate of Animal Resources (DAR) will lead and coordinate the activities of a dairy stakeholder platform which will gather on a regular basis. Participants to the platform will be: (i) milk producers, including smallholders; (ii) milk processors, including small scale processors; (iii) milk traders, including "Hallab", importers, exporters; (iii) service and input providers (AI, feed, breeding stock traders…); (iv) public authorities: Ministry of Agriculture, Ministry of trade, and other public entities on ad-hoc basis depending on the agenda; (v) research organizations; and (vi) any other value chain actor whose presence could be needed according to the agenda. The main issues addressed by the platform could be (i) quality issues, including prevention of anti-microbial resistance through prudent use of anti-microbial agents and how to establish a quality payment system, (ii) price negotiation and

[31] The Lebanese Dairy Board is a non-profit organization and is composed of 6 dairies: TaanayelLes Fermes/Bonjus, Dairy Khoury, Liban Lait, Dairy Day, Dainka Dairy, and Jdita. It is in the process of changing its name to reflect its real composition and role, which are not those of a board.

regulation, with the aim of having a fairer price mechanism that benefits better to smallholders, and (iii) participation in policy processes. Studies would be commissioned to provide qualified background for evidence-based dialogue, for instance on the impact on imports of the milk sector, on milk quality issues, and on the feed and fodder market (availability and quality). HALEPP M&E system will also consider indicators for measuring the outputs, outcomes and impacts of this policy dialogue.

93. Regional platforms will also be established in the 7 governorates. They will focus more on technical issues and act as problem-solving mechanisms and technical innovation platforms; they will also ensure the upward flow of information to the National level.

94. The project will facilitate meetings and transport of participants from the regions. It will ensure that smallholder farmers, and small-scale processing groups, are adequately represented in the platform. To that effect, participants to the National platform will be selected among participants in the regional ones who are the most active. Participants to the regional platforms will be selected among farmers benefiting from extension and advisory services. The project will also support coordination and dialogue between smallholder farmers' groups, which could result in the creation of a National body (or several regional ones) representing smallholder farmers.

Appendix 5: Institutional aspects and implementation arrangements

Institutional aspects

1. Numerous government institutions (ministries, autonomous or semi-autonomous agencies) are involved in the development of dairy sector. For the provision of technical support services to smallholder producers and processors (extension, quality control, marketing support), government institutions play only a limited role with most activities undertaken by NGOs.

2. **Ministry of Agriculture (MOA).** The MOA is responsible for the formulation and implementation of agricultural development policies and strategies in the various regions of the country. At the central level, it comprises two General Directorates (General Directorate of Cooperatives and General Directorate of Agriculture). The General Directorate of Agriculture is organized into four Directorates: (i) Directorate of Studies and Coordination; (ii) Directorate of Plant Resources; (iii) Directorate of Animal Resources; and (iv) Directorate of Rural Development and Natural Resources. The Directorate of Studies and Coordination includes an agricultural extension department. The Directorate of Rural Development and Natural Resources encompasses a rural engineering service with a small rural project and irrigation department. In addition to its central structure, the MOA has five regional offices in the field (one in each mohafazat except Beirut).

3. It rests with the ministry's responsibility to ensure the implementation and updating of laws, decrees and decisions within the powers and the responsibility of coordinating with other ministries and public departments and organizations of Arab, regional and international bodies and non-governmental organizations and the private sector.

4. The MOA has implemented several donors funded projects, mostly through grants. This includes technical assistance projects from multilateral (FAO) or bilateral (EU, GTZ) sources. The participation of MOA in these projects consists mainly of offices and participation of some of its staff, who receive additional salary allowances from donor funds. Existing budget and staff recruitment restrictions imposed on MOA (and, more generally, the public sector) have resulted in a lack of focus and development of agricultural extension within the MOA structure. MOA has recently moved towards encouraging NGOs to take up some of the existing (vacant) MOA facilities developed for advisory activities on a contractual basis using short term donor funding. This has enabled to achieve some results, but the long term situation remains unstable without proper MOA staff and funding.

5. **General Directorate of Cooperatives (GDC).** GDC is composed of a central administration and 5 regional departments, comprising the central administration of the three regional offices divided into 14 constituencies. The GDC is responsible for the cooperative movement affairs in the country, particularly regarding the deployment of the cooperative movement, development and guidance, federations and cooperative societies, and monitor their work, and to address issues related to establishment and registration solution and liquidation, and to ensure the application of the provisions of the laws and regulations sponsored.

6. There is a large number of inactive agricultural cooperatives, and a decrease in the percentage of farmers' enrolment into cooperatives (because of lack of motivation), as well as a decrease in the number of young members. Extension service delivery to cooperatives is very limited because of the limited human and financial capacity at the GDC. The directorate has recently embarked upon a review process which is aiming at deregistering the cooperatives that are not operational anymore, which are believed to be more than two third of the 1300 cooperatives. Many cooperatives are registered with a wide range of purposes, and it is therefore difficult to know how many are focusing on the dairy sector.

7. **Animal Resources Directorate (ADR).** DAR is placed under the authority of the Directorate General of Agriculture. It is in charge of the technical aspects related to animal production, including diseases control, imports control, extension, and regulation. Under the umbrella of the DAR there is a number of departments: Department for Animal Health (DAH), Department for Livestock Production and Breeding (DLPB), Department for Economics, Livestock Processing and Marketing (DELPM), and Department of Export and Import Control and Veterinary Quarantine (DEICVQ).

8. **Education and Extension Service.** Public extension services in Lebanon are provided by the Extension Department, a subdivision of the Extension and Agricultural Education Service located within the Directorate of Studies and Coordination within the Ministry of Agriculture. The Extension Department gets its budget, usually very little, from the Ministry. However, it manages to get supplemental funding now and then from donors when they need extension support for their projects or programs. The Extension Department, suffering from the shortage of staff, usually outsources specific extension tasks to universities and non-public actors.

9. **Lebanese Agriculture institute (LARI).** LARI is a governmental organization under Minister of Agriculture Supervision. The institute conducts applied and basic scientific research for the development and advancement of the agricultural sector in Lebanon. LARI is conducting some development activities such as production of quality seeds. diagnosis of animal diseases, production of vaccines. food quality control, soil analysis, feed composition plant protection and others. LARI has a number of very good core facilities and activities which are capable of providing key services to agricultural producers, including dairy producers. The Fanar station has an animal health department which includes animal disease unit and vaccine unit. The animal disease unit works on identifying the etiology of animal diseases (poultry, small and large ruminants) by post mortem, Parasitological, microbiological, and serological analysis in order to reduce economical losses in animal production.

10. **Other ministries** also play significant roles in the dairy sector: The Ministry of Health has recently embarked in a campaign aiming at reinforcing food safety along all food value chains, including dairy, resulting in the closure of numerous dairy processing facilities. The Ministry of Trade and Industry is also involved in inspection of dairy facilities and enforcement of standards. LIBNOR is the national body in charge of setting standards, including for dairy, and is placed under the Ministry of Trade and Industry. The interventions of these different administrations are not well coordinated and result in a certain confusion, which is not conducive to business. A food safety authority has been established by law but not created yet; it will probably contribute to improve the enforcement of standards but also improve coordination. The Ministry of Social Affairs launched the National Poverty Targeting Programme (NPTP) in 2011. The development objective of NPTP for Lebanon is to expand the coverage and enhance the social assistance package of the NPTP to Lebanese affected by the Syrian crisis and all Lebanese households under the extreme poverty line.

11. **Rene Moawad Foundation (RMF).** RMF was established on 1991 as a Lebanese NGO. The main objective of RMF is to promote social, economic and rural development in Lebanon and the MENA region and contributing in building a responsible civil society that promotes democratic values, justice, pluralism and moderation. RMF focuses on 5 core areas: (i) education and human development, (ii) economic development, (iii) health and social care, (iv) agriculture and rural development, and (v) local authorities and decentralization. The staffing capacity of RMF includes 170-member staff working across 6 satellite offices in Lebanon: Mejdlaya, Akkar, and Tripoli (North), Jbeil (Mount Lebanon), Achrafieh (Beirut), Lebaa (South).

12. Regarding project is dairy sector, RMF has implemented 3 projects for the EU, USAID, Spanish Cooperation, and UNHCR. The most recent of these projects is the EU funded project (Enhancing Dairy Sector in North Lebanon (November 2015 -November 2017) which is focused on enhancing the dairy sector in North Lebanon. The project is benefiting

270 farmers including 23 females. Previously, RMF implemented a USAID funded project (Improvement of the cattle production sector through the expansion of nutrition, reproduction and dairy sectors (July 2009 – June 2011)). Moreover, there is currently 3 ongoing infrastructure projects which are funded by the UNHCR in communities which are affected by the Syrian crisis, benefitting both Lebanese and Syrian refuges.

13. Specific training and extension themes covered by RMF programmes include: Dairy farm management cattle and small ruminants (Reproduction and fertility management, feeding and nutrition, Calf and kids rearing, Vaccination and veterinary prevention, forage production, Quality of milk, cheese processing and hygiene, Fermented dairy products processing (Yoghurt, Labneh, Chanklish), quality control of the processing.

14. **Mercy Corps (MC).** MC has been working in Lebanon since 1993. The main strategy of MC is to: (i) improve capacity of local government and communities to support escalating needs of Lebanese and Syrian refugee families, (ii) reduce tension and boost economic stability by increasing access to sustainable, productive livelihoods, and (iii) engage youth in positive social opportunities and support leadership development as an investment in Lebanon's future. MC works in five main domains: (i) agriculture and food, (ii) children and youth, (iii) conflict and governance, and (iv) economic opportunity, and v) water.

15. Extension themes covered by MC programmes include: flock disease prevention and treatment, flock nutrition, milk hygiene, farm management and marketing practices, Hazard Analysis Critical Point (HACCP), Good Hygiene Practices (GHP) and Good Manufacturing Practices (GMP), Lebanese food regulations (to ensure sound product quality throughout the value chain). Marketing trainings include teamwork, sales and marketing techniques, cost analysis, and business planning.

16. **Arcenciel** is a 30-year-old Lebanese NGO with a wide portfolio of technicians in charge of providing specific intensive training to help farmers reduce their costs, improve their quality and learn new skills. Arcenciel extension and training topics includes three sectors: animal production, crop production and food processing. In the animal production Arcenciel delivers the following training topics: dairy cow farm management, apiculture, goats and poultry husbandry, promotion of good practices from pre-to-post-harvest including cooperative and business skills training, food hygiene and safety, dairy processing, fruit and vegetable conservation. Currently, Arcenciel is in in charge of implementing an EU funded project for the promotion of solar panel powered pumps, rainwater collection reservoirs, modern irrigation systems, packaging, commercialization (farmers' markets and events.

17. **The Association for the Development of Rural Capacities (ADR).** ADR was founded in 1998 to serve the needs of marginalized people living in South Lebanon. ADR's mission is to empower and integrate marginalized people through sustainable economic and social development. ADR's target beneficiaries are fishermen, farmers, small entrepreneurs, refugees, local community groups and cooperatives, women and the youth from the most impoverished areas of Lebanon. The main objectives of ADR are to (i) improve access to training, tools, information, and financial services, (ii) facilitate access to the labor market and develop income generating projects, and (iii) promote partnerships and decentralized cooperation. Since its creation, ADR designs and implements projects according to the communities needs through its four key programs: micro credit, vocational training, sustainable agriculture, and social services.

18. **Rural Delights Cooperative (RDC).** RDC is a non-profit organization and the hub of a network of 42 women-owned agricultural and artisanal cooperatives. RDC was established in 2002 and is the first cooperative specialized in marketing in Lebanon. The cooperative was established initially as a result of a USAID funded development program and aims at providing rural women in Lebanon with income generation opportunities. The program established food processing centers owned by women and that were linked to the newly

formed RDC for marketing their produce. Since then, RDC implemented numerous projects to enhance the women's production and services marketed under our brand names as well as other projects to empower rural communities. Rural Delights cooperatives specializes in traditional Lebanese food that is totally free of any additives or preservatives as well as handmade handicrafts, crochet, accessories, soap and candles.

19. **Other NGOs** whose work is relevant to the livelihoods and needs of the target group (smallholder dairy producers and processors and unemployed Lebanese and Syrian youth) include: Caritas Lebanon Migrant Center (CLMC), Action Against Hunger, Amal Association, Muslim Aid, Concern Worldwide (CW), Jihad Al-Bina'a Development Association (JBDA) Hariri Foundation, Safadi Foundation. Associazione Volontari per il Servizio Internazionale (AVSI), Cooperative Housing Foundation (CFH) Young Men Christian Association (YMCA), etc. These NGOs provide a combination of humanitarian aid and development assistance, including extension services, training, and access to markets.

20. **AUB: Environment and Sustainable Development Unit (ESDU).** Established in 2001, ESDU is an inter-disciplinary research and development center specialized in community development and sustainable agriculture hosted at the Faculty of Agricultural and Food Sciences of the American University of Beirut (AUB). ESDU was involved in the implementation of the following two projects of direct relevance to HALEPP objectives: Capacity Building for Sustainable Animal Production as a part of Coastal/Midlands Agricultural Development Project: this IFAD supported project aimed at improving milk handling, processing and marketing in Syria with emphasis on women. The second project is "Sustainable livelihoods in semi-arid areas: Adapting agro-pastoral systems to climate change and empowering rural women"; in collaboration with Green Villages and funded by GIZ. Participants (including shepherds, milk collectors and female milk processors) from West Bekaa and neighboring villages were trained on different topics to improve their small ruminants' production. Farmers were trained on herd management/improvement and health, production of quality milk, pastures management and herd's nutrition. Vaccines and drugs were distributed as well as vetch seeds to regenerate natural pastures.

21. **The Lebanese Center for Energy Conservation (LCEC**) is the national energy agency for Lebanon. LCEC is a governmental organization affiliated to the Lebanese Ministry of Energy and Water. LCEC is the technical arm of the Ministry in all subjects related to energy efficiency, renewable energy, and green buildings. It is the leading provider of energy efficiency and renewable energy programs to the public and private sectors in Lebanon. LCEC provides both the public and private sector with expert advice, finance and accreditation, develops energy efficiency standards and labels, and provides national energy database indicators. LCEC is currently in charge of implementing the National Energy Efficiency and Renewable Energy Action (NEEREA), which was developed to encourage the implementation of the actions needed for the national objective and to ensure the sustainability of the energy efficiency and renewable energy sector in Lebanon. NEEREA is a national financing mechanism initiated by the Central Bank of Lebanon in collaboration with the Ministry of Energy and Water, the Ministry of Finance, the UNDP and the EU. It is a national platform built and launched on 25 November 2010 to provide subsidized green loans focused on energy efficiency, certified green buildings, and renewable energy. The loan has a ceiling of USD 20 million and is offered at an interest rate of 0.6% for 14 years including a grace period of 6 months to 4 years. Private, existing and newly built facilities can all apply to this loan if and only if the project presented is an environmental friendly one such as energy efficient lighting, motors, heaters, and coolers or is a source of renewable energy such as solar, wind and hydro.

Implementation Arrangement

22. Based on previous and ongoing experience with implementation of IFAD supported projects, and given the weak capacity at the Ministry's level, HALEPP implementation would combine making use of relevant directorates within the MOA and outsourcing to qualified institutions, NGOs (as mentioned above) and private service providers. Their involvement would be through **call for proposals and performance based MoUs**. Implementation arrangements at component and subcomponent level are presented in Appendix 4.

Appendix 6: Planning, M&E and learning and knowledge management

1. This section contains summarised information on how HALEPP will undertake planning, M&E, learning and knowledge management. More detailed information can be found in Annex 6 on M&E and knowledge management.

Planning

2. A key planning instrument will be the annual work plan and budget (AWPB). The AWPB will provide a timetable for implementation of a set of scheduled activities, together with their respective budgets and inputs. AWPBs are formulated taking into consideration the previous AWPB, programme design report, supervision report recommendations and legal agreements, contract and management agreements of service providers and implementing partners. Financial allocations within the AWBB constitute a basis for release of funds and financial control. An AWPB is an essential covenant in the legal financing agreement; failure to prepare it on a timely basis may lead to delay or suspension of fund disbursement by IFAD and other donors.

3. The first AWPB will be prepared, together with the procurement plan for the first 18 months of the programme, as part of the final design report, and be presented for discussion during the start-up workshop for submission to IFAD for no objection. The preparation of the following AWPBs should be prepared, discussed and approved no later than sixty days before the end of the financial year. Experience shows that this review process requires a minimum of six months. If required the PD, through the PSC, can propose adjustments in the AWPB during the relevant programme year, which will become effective after clearance by IFAD.

Monitoring and evaluation

4. The Monitoring and Evaluation (M&E) system is designed to offer comprehensive and reliable information to improve planning and decision-making for results- based management. The M&E of HALEPP achievements and knowledge management would be the responsibility of PD. An M&E specialist will be responsible for collection of relevant data on the activities, outputs, and outcomes. Furthermore, she/he will review the performance of components and sub-components on the basis of information collected from the field. These and other activities will be geared to facilitating compilation and dissemination of relevant project knowledge about issues, experiences, and insights to all stakeholders.

5. The logical framework would constitute the basis for results-based M&E, and include an initial list of indicators to track progress and achievements. This will be through accounting for progress against AWPB targets; and routine, periodic assessments of movement towards beneficiary impact. The M&E specialist will be responsible for all M&E activities, based on the IFAD guidelines, which specifies a matrix and performance checklist to orient the selection of indicators, baseline data, methods for data collection, synthesis and a communication strategy for lessons learned. The Project draft M&E matrix will be prepared in a participatory manner as part of the start-up activities in line with the logical framework. The M&E function of the project is designed with a close link to the project management activities, which will be carried out by an M&E specialist. Key M&E activities will comprise the project implementation manual at start-up stage, the AWPB, annual data collection, semi-annual progress reporting of activity and output targets and achievements, mid-term review, and the completion report along with the project completion/impact assessment survey. As part of the M&E system, a number of studies/surveys will be conducted as follows:

6. **Project Baseline Study.** The project baseline is a critical element in the project M&E system. It provides the basis for the assessment of how efficiently the activity has been implemented

and results achieved. The Baseline study will include the target group and a control group which will be essential to determine the attribution of results to project activities. At the beginning of implementation, a Baseline Survey would be conducted in selected locations to assess the physical and socio-economic status of the communities and livestock households and to define their benchmark status.

7. **Mid-term Review.** An external evaluation performed towards the middle of the period of implementation of HALEPP, i.e. in year 3. It will assess operational aspects such as project management and implementation of activities as well as the extent to which the objectives are being fulfilled. It will focus on corrective actions needed for the project to achieve impact.

8. **Project completion survey (impact evaluation)** will include the same set of questionnaires included at baseline to allow for comparison against baseline results. In addition, a panel of households will be interviewed to provide a thorough analysis of project impact. Moreover, analysis will be done by type of beneficiary, region and gender of household head.

9. **The Results and Impact Management System (RIMS)** developed by IFAD since 2004 would be fully incorporated in the project M&E system. a systematic methodology and set of common indicators across programmes and regions to measure and inform on the performance and impact of projects. The RIMS is based on a comprehensive system of concepts, definitions and indicators for results and impact. It provides flexibility in the monitoring of results and simplicity in the evaluation of impact. It also allows the sharing of information among various stakeholders. RIMS were slightly modified and improved by IFAD management in April 2017 (Ref. Taking IFAD's Results and Impact Management System (RIMS) to the Next Level. EB 2017/120/R)

10. The performance of RIMS depends largely on that of the M&E System. The RIMS report for the level 1 and level 2 indicators will be prepared at the end of each fiscal year and reported to IFAD before 31st of January.

11. **Geo referencing.** All activities of HALEPP will be geo referenced at the village level. This will allow for monitoring of the coverage of the project intervention as well as the concentration of certain activities in specific areas. All project covered sites, processing facilities supported by HALEPP and MFIs participating in the project will be geo referenced.

12. **Beneficiary database.** The database will be developed for all beneficiaries of the project. Details about each beneficiary will be included in the database including: physical address, national identification, age, sex, and activities participated in. The database will allow for tracking beneficiaries and activities as well as providing a mean for sampling for data collection and visits during supervision missions.

Learning and knowledge management

13. The learning process will be part of the regular M&E activities. Lessons learned will be prepared and reported covering each component activities. The learning and knowledge management (KM) activities will include the regular monitoring mechanisms, progress reports, mid-term evaluation, and impact assessment evaluation at the end of the project.

14. During the final year of HALEPP implementation, as part of the preparation of the IFAD-required project Completion Report/Impact Assessment (PCR), the M&E data collected over the project implementation period will be used as part of a thorough assessment of project achievements. In particular, this shall compare changes in the livelihoods of beneficiaries that relate to the implemented project activities against the baseline situation. Innovations and best practices at village level will be documented for the purpose of replication and scaling-up.

15. KM activities will use project data and information from the M&E system. Lessons learned will be prepared for each component in order to share experiences. The objective of the KM work

is to integrate knowledge management and communication in all aspects of project management (including design, implementation, M&E, financial management, supervision and reporting) to improve project management processes and delivery of the programme objectives. In developing the KM system, the following will be considered: design of an appropriate monitoring, evaluation and documentation system; development of appropriate institutional arrangements; information management; communication; and knowledge based project support, decision making and policy dialogue.

16. Progress reports will serve as a formal knowledge product that covers implementation activities including details about planned activities versus actual, physical and financial progress, key corrective actions taken and forecasts for next reporting period.

Appendix 7: Financial management and disbursement arrangements

A. Financial management assessment (FMA) of the Project

1. **Methodology.** In accordance with IFAD guidelines, a Financial Management Assessment (FMA) has been undertaken as part of project design. The objective of FMA is to provide assurances that the Project will be implemented in an environment with sufficiently strong financial management systems and controls in place to properly manage, control and report on programme finances. The FMA involves assessing: (i) the inherent risk at country level; and (ii) the project specific risk.

2. Country **context and inherent risk.** The inherent risk in Lebanon is high. The Corruption perception index is high risk and has slightly deteriorated in the past four years from 30 in 2012 to 28 in 2016. Similarly, the World Bank's doing business reports notes a deterioration in all indicators from 2015 to 2016, and as a result the country ranking with regards to the ease of doing business has dropped from 121 to 123. To date, only one PEFA assessments has been made publicly available (2004) which is outdated leading to a lack of information on the state of the country's public financial management systems. The country has also been suffering from and a political crisis being without a president for almost three years which has affected the government institutions. However, the situation appears to be improving Now.

3. **Project financial management.** To ensure efficient project implementation, a standalone PD will be **established** under the Ministry of Agriculture. The PD will assume overall responsibility of managing the projects' fiduciary performance and all financial management activities. The FM activities to be performed by the PD includes: project accounting, producing consolidated project financial reports, organizing the Project's annual audits, submission of withdrawal applications, coordination with other implementing partners on implementation and financial management issues. Based on past experience, in Lebanon, the quality of FM increased significantly once the project's FM unit became fully staffed and an accounting software was installed. As a result, getting the FM staff on board from the start of the project and procuring an accounting software that meets IFAD's requirements in the first quarter of the project implementation will need to be ensured.

4. **Anticorruption and Good Governance Framework.** In accordance with its Policy on Preventing Fraud and Corruption in its Activities and Operations (Anticorruption Policy), adopted by the Executive Board in December 2005, IFAD applies a zero-tolerance policy towards fraudulent, corrupt, collusive or **coercive** practices ~~s~~in projects financed through its loans and grants. 'Zero tolerance' means that IFAD will pursue all allegations falling under the scope of this Policy and, if allegations are substantiated, appropriate sanctions will be applied on the parties or entities involved. Among the remedies available to IFAD under the General Conditions for Agricultural Development Financing~~,~~ ~~–~~are the suspension and cancellation of a loan and/or grant. IFAD may suspend, in whole or in part, the right of the Borrower/Recipient to request withdrawals of funds after giving notice to the Borrower/Recipient that credible allegations of coercive, collusive, corrupt or fraudulent practices in connection with the Project have come to the attention of IFAD, and the Borrower/Recipient has failed to take timely and appropriate action to address the matters to the satisfaction of IFAD. IFAD may cancel, in whole or in part, the remaining amounts in the Loan and/or Grant Accounts, after consultation with the Borrower/Recipient, if IFAD thereafter determines that coercive, collusive, corrupt or fraudulent practices were engaged in by representatives of the Borrower/Recipient or any Project Party, and no timely and appropriate action was taken to remedy the situation. All payments made relating to any coercive, collusive, corrupt or fraudulent practice by any

representative of the Borrower/Recipient or any Project Party, shall be considered ineligible for IFAD financing and shall be refunded to IFAD.

5. Under the General Conditions for Agricultural Development Financing, by notice to the Borrower/Recipient, the Fund may require that all bidding documents and contracts for procurement of goods, works and services financed by the Financing include provisions requiring bidders, suppliers, contractors, sub-contractors and consultants to: (i) allow full inspection by the Fund of all bid documentation and related records; (ii) maintain all documents and records related to the bid or contract for three years after completion of the bid or contract; and (iii) cooperate with agents or representatives of the Fund carrying out an audit or investigation.

6. IFAD takes all possible actions to protect from reprisals individuals who, in good faith, report coercive, collusive, corrupt or fraudulent practices in its project or grant activities. The primary responsibility for enforcing the Anticorruption Policy lies with the Borrower, and the first defence for controls shall be exercised by Project staff, Implementing Partners and Counterparts. Pursuant to this, the Borrower shall have the responsibility to incorporate pertinent provisions of the Anticorruption Policy in its contracts with project staff, cooperating/implementing partners, suppliers/consultants or any other third party entities. Given IFAD's zero tolerance described in the above paragraph, it is important that the project staff and all stakeholders of the project are familiar with IFAD's Anticorruption Policy as well as the national anticorruption policies and whistle blowing procedures.

7. **Financing profile.** At this stage of the design, it is envisaged that total financing of the project amounts to USD 13.6 million. The IFAD financing includes a loan on ordinary terms of USD 4.6 million, an IFAD grant of USD 0.6 million, and a grant of USD 5.2 million from the FAMRS facility. Government of Lebanon is expected to provide USD 2.9 million to cover taxes and duties as well as most of the salaries. The beneficiaries are expected to provide USD 0.3 million.

8. **Denomination currency of the IFAD financing.** It is expected that the GoL will request to have the IFAD financing denominated in USD instead of SDR. In this regard, IFAD will aim to secure the funding in USD and inform GoL accordingly.

9. **Taxation.** The GoL will cover all taxes under the project. Consequently, IFAD funds cannot be used to pay VAT, duties or other taxes imposed on the project. However, as per IFAD procedures, taxes paid by the ultimate recipient of an expenditure (e.g. income taxes paid by a project employee or withholding taxes on the profits of a contractor) are not considered to be taxes paid by the Project.

10. **Project specific Financial Management Assessment.** As required by IFAD Financial Management assessment guidelines, the summarised scoring at design is as shown in the table below.

Table 1: Risk assessment at design stage

Type of risk	Initial Risk Assessment	Proposed mitigation	Final Risk Assessment
Inherent Risk			
1. TI Index	28		High
Control Risks			
1. **Organisation and staffing** ➢ **No FM staff in place.**	H	➢ A qualified Finance manager and an accountant to be hired through a competitive procedure subject to IFAD non objection. All FM staff to receive training in IFAD FM procedures, policies and systems including IFAD anticorruption policy and whistleblowing mechanism.	M
2. **Budgeting** ➢ **Budget approval, budget format and budget controls not established.**	H	➢ The consolidated AWPB to be submitted for IFAD non-objection 2 months before the beginning of the fiscal year. ➢ Proper budget controls to be ensured in the accounting software.	M
3. **Funds flow and disbursement arrangements** ➢ **Complex and possibly cumbersome flow of funds. Especially Disbursements from MoF treasury accounts to the project DAs may be subject to delays. IFAD Client Portal (ICP) may not be used to the fullest as electronic signature is not recognized.**	H	➢ Separate designated accounts to be opened for each financing source in the Central Bank of Lebanon. ➢ Procedures for requesting funds from the MoF t treasury accounts to be well documented in the financial procedures manual. ➢ Audit trail for each expenditure item to be properly disclosed in the Withdrawal Applications. ➢ The FM capacity of the implementing partners to be assessed and MoU with the implementing partners to include clear disbursement triggers, reporting requirements and audit clauses. ➢ The use of ICP needs to be agreed and documented during loan negotiations. ➢ Direct Payments to be used when possible and the Authorized Allocation is to be increased to compensate for eventual delays.	M
4. **Internal controls** **Government laws in place but no project specific financial procedures in place.**	M	➢ A comprehensive financial procedures manual, is to be formulated as part of the start-up phase.	M
5. **Accounting systems, policies and procedures** ➢ **No adequate accounting software in place.**	H	➢ IPSAS cash accounting standards to be adopted. ➢ A standalone accounting software is to be procured and customized to produce all IFAD forms and financial reports and to include proper budget controls.	M
6. **Reporting and monitoring** ➢ **Financial report formats not in place.** ➢ **Financial report formats required from the implementing partners need to be developed.**	H	➢ Reporting templates to be established and the Accounting system to be customized to produce these reports automatically by the PD. ➢ PD to produce quarterly Interim Financial Statements and annual financial statements.	M
7. **Internal Audit** ➢ **No proper IA function in place.**	H	• No IA function exists in MoA.	H
8. **External audit** ➢ **No annual audit function in place. Private auditors need to be selected according to IFAD procedures to conduct annual audits.**	H	• PD to provide consolidated audit report including the implementing partners. • IFAD non objection required for the Audit TORs. • Auditor to be selected using LCS from an MoF approved longlist and IFAD approved shortlist with 70% qualifying mark on quality.	L

Type of risk	Initial Risk Assessment	Proposed mitigation	Final Risk Assessment
Fiduciary risk at design stage ➢ **As the PD and its FM procedures are currently not in place the initial risk rating is assessed as high risk.**	H	Mitigation actions listed above.	M

NB: H/M/L = High, medium and low risk as per the Guideline Note on undertaking Financial Management Assessment at design.

11. **Conclusion.** The initial risk rating is considered to be High. The final risk rating is expected to become medium after implementation of the mitigation actions during the first or second year of implementation.

Proposed financial management arrangements

12. **Proposed financial management arrangements.** The proposed FM-arrangements including staffing, budgeting, accounting, internal controls, flow of funds, financial reporting, and audit arrangements are summarized below and will be outlined in detail in the Project's Financial Procedures Manual.

13. **Staffing.** The PD will hire on a competitive basis a qualified Finance Manager and a project accountant through a competitive selection process. The FM staff will need to have a degree in accounting as well as experience in project accounting and financial management. The FM staff will report to the PD coordinator. As part of the project start up the FM staff will be trained in IFAD FM procedures and systems.

14. **Budgeting and Budget control.** The GoL's fiscal year runs from 1st January to 31 December. Based on inputs from the stakeholder the PD will prepare a consolidated Annual Work Plan and Budget (AWPB) in a format acceptable to IFAD and submit it to IFAD for its non-objection at least two months before the beginning of the relevant fiscal year. Once the project has received IFAD non objection it will be approved by the Project Steering Committee. The format of the AWPB will indicate at least the following: expenditure items by activity, by component, by expenditure category, and by implementing entity, physical indicators by activity as well as funding requirements by financier on a quarterly basis. In addition, the AWPB will contain detailed list of any staff hired by the project and their salary scale. Any incurred expenditures as part of the project will have to be part of the approved AWPB to be considered eligible for IFAD financing.

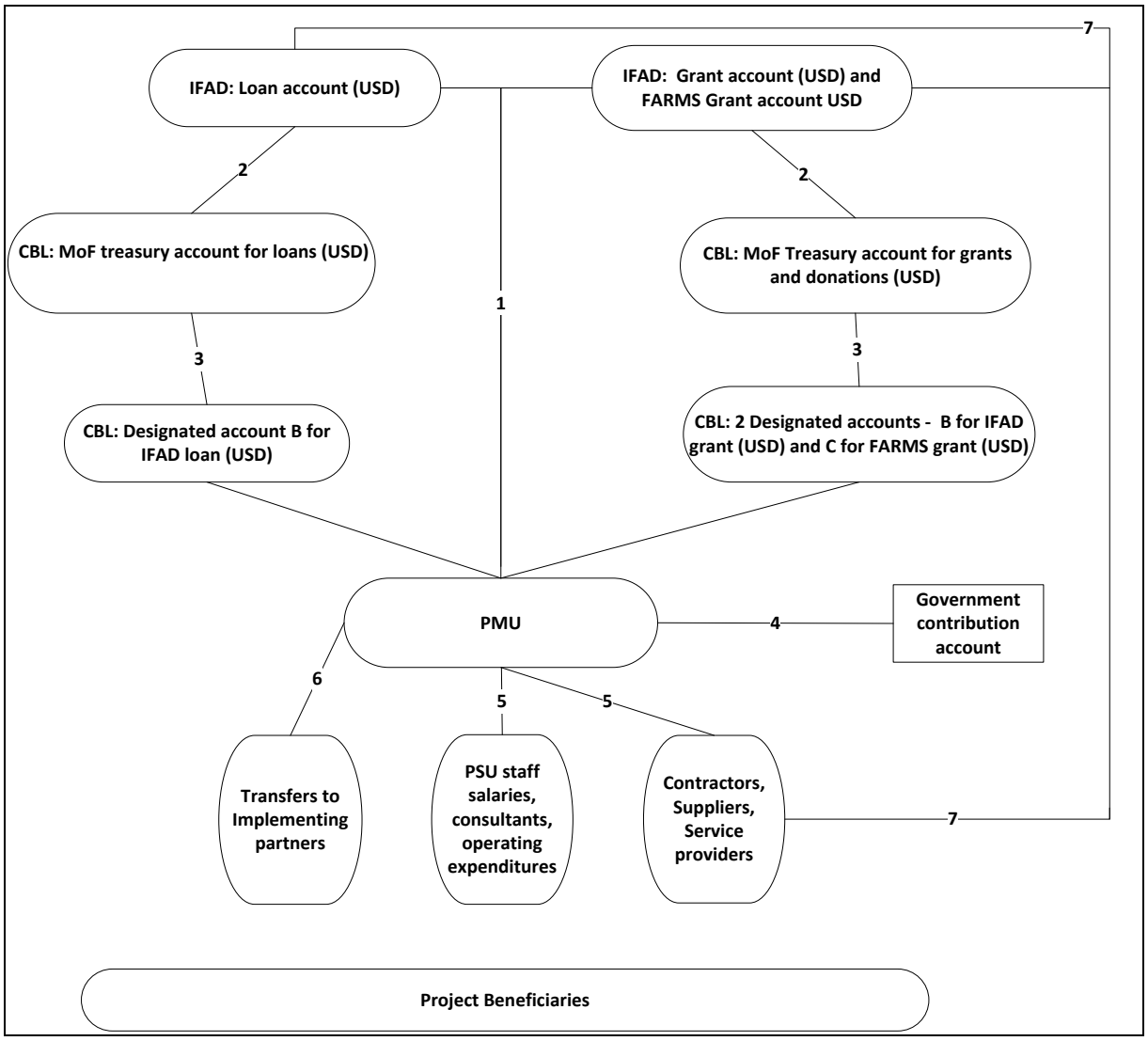
15. **Accounting.** The PD will maintain its accounting records in accordance with IPSAS-cash basis of accounting. The project transactions will be recorded in an accounting software to be procured as part of the project start up and maintained in the PD. Software that currently satisfy IFAD's requirements in the country include Logos and Techwise by Techrock. The accounting software will include a budget module with proper budget controls, accounting module, financial reporting module, procurement module, fixed asset register etc. and will be customized to automatically produce all necessary reports and IFAD withdrawal application forms.

16. **Internal Controls.** In order to ensure: (a) efficiency; (b) reliability of financial reports; and (c) compliance with applicable laws and regulations including the conditions set forth in the financing agreement, the PD will ensure that adequate internal controls including:

- Adequate policies and procedures including a financial procedures manual, and accounting manual which are to be revised once a year;
- Sufficient segregation of duties;

- Monitoring of fixed assets including tagging of all assets, maintaining of a fixed asset register and annual inventory exercises;
- Periodic monitoring and review including comparison of physical and financial progress;
- Proper authorization and access levels are maintained through the project parties;
- All project sites are clearly identified and mapped including GPS-coordinates (as appropriate) to facilitate supervision and that this information is shared with other donors supervising projects in the same sector;
- All trainings will be duly documented including a list of participators;
- All distributed goods, agricultural inputs etc.., reconciled against procured goods and supported by distribution lists of sufficient detail; and
- All implementing partners FM-capacity will be properly assessed before the awarding of the contract and their financial performance will be continuously assessed.

17. **Flow of funds.** With regards to the flow of funds, government procedures will be applied to IFAD funding in the same way as with other donors including the World Bank. Accordingly, the IFAD financing will be channelled from IFAD through the Borrower's treasury accounts to three separate designated accounts, a (IFAD loan), B (IFAD grant), and C (FARMS grant) denominated in USD and maintained in the Central Bank of Lebanon in accordance with IFAD's disbursement procedures. Designated Account A will receive IFAD loan funds through Ministry of Finance's pooled treasury account for loans. Designated Accounts B and C will receive IFAD grant and FARMS grant funds through Ministry of Finance's pooled treasury accounts for grants and donations. The transfers from the MoF treasury sub-accounts will be based on requests made by the PD through MoA. The project designated accounts A, B and C will be operated by the PD under the joint signature of th finance Manager of the PD and a designated ministry official. In addition, there will be a separate counterpart account for government contribution.



(Proposed Flow of funds)

1: PD prepares separate Withdrawal Applications according to IFAD disbursement procedures for the IFAD loan, and IFAD grant- and submits the WAs to IFAD as soon as the minimum WAs thresholds have been reached (30% of the AA or once a quarter). All WAs must be approved by the Authorized Signatories as determined by MoF.

2: IFAD disburses the funds to a project specific transit sub-account under the Ministry of Finance treasury account for loans or grants and donations account as specified in the WA.

3: Once the funds have been received by the MOF transit subaccount, the PD will submit a request to MOF to transfer the funds to the designated account A (loan), B (Grant) or C (FARMS grant) as applicable.

4: MoF/MoA will deposit counterpart financing in a separate account.

5: The PD will pay PD staff, contractors, suppliers service providers etc. and retain supporting documentation as required by IFAD disbursement procedures.

6: Advances to Implementing partners will be made in accordance with sub agreements acceptable to IFAD. IPs will justify the advances on a quarterly basis by submitting supporting documentation to the PD as required by IFAD disbursement procedures.

7: In case the payment exceeds USD 100 000, The PD may request IFAD to pay directly to the Contractor, supplier, service provider or Implementing Partner using the Direct Payment method.

18. **Mitigation of Disbursement delays.** Based on past experience in the country, the project implementation may suffer from significant delays in receiving the funds. In the particular the transfer of funds from MoF treasury accounts to the Project designated accounts are foreseen to be a bottleneck. This will be mitigated by the following measures:

- The direct payment modality is to be used for payments of USD 100 000 and above.
- Procurement is to be bulked together when possible to increase efficiency and the value of the contracts to take full advantage of the Direct Payment modality (Payments above USD 100 000).
- The Authorized Allocation of the designated account s is to be increased to compensate for eventual delays covering approximately 8 months' expenditure.
- Regular and timely submission of WAs to IFAD.
- A training event to be organised at the project start-up phase with the PD, MoA and MoF staff in the underlying procedures for requesting funds from the MoF transit treasury subaccounts and the procedures are to be well documented in the project's financial procedures manual.

19. **Financial Reporting.** The PD will further customize its accounting software to automatically produce financial reports on a quarterly basis in a format agreed with IFAD. The PD will provide IFAD with consolidated financial reports within agreed timeframes as follows:

- Quarterly consolidated interim financial reports (IFRs) as agreed with IFAD.
- Annual consolidated Financial Statements within four months after the end of the fiscal year prepared in compliance with International Accounting Standards (IPSAS cash) and IFAD requirements.
- Annual consolidated audit report and a management letter within six months after the end of the borrower's fiscal year.

20. The financial reports outlined above will in include at least the following reports: (i) sources and uses of funds by financier; (ii) incurred expenditures by component and financier, (iii) actual expenditures vs budgeted expenditures by financier by component, (iv) designated account reconciliations, (v) Statement of Expenditures - Withdrawal Application Statement, (vi) a fixed asset register, and (vii) implementing partner report disclosing expenditures incurred by the different implementing partners and any advances still unjustified.

21. **Internal audit.** There is no internal audit function in the MoA. However, MoA has an controller function from the MoF which checks the availability of funds before signing off on the payment.

22. **External audit.** The PD will appoint independent auditors, selected in accordance with the procedures and criteria set forth in IFAD's Guidelines on Project Audits (for Borrower's Use). The auditors will be procured using LCS from MoF approved long list and IFAD approved shortlist with a 70% qualifying mark on quality. The auditors will be required to audit the consolidated financial statements of the entire Project for each fiscal year in accordance with International Standards on Auditing (ISA). The terms of reference for the audit will be agreed with IFAD on annual basis. The auditor will be required to issue a separate opinion on (i) the project financial statements, (ii) SOE-WA statement including the adequacy of supporting documentation, (iii) operation of the designated account, (iv) funds used by the implementing partners; and (v) compliance with procurement. The auditors will also prepare a Management Letter giving observations and comments on the internal control systems of the PD as well as the implementing partners, and providing recommendations for improvements in accounting, records management, systems, controls, compliance with financial covenants in the Financing Agreement and compliance with previous year's auditors' recommendations. The audit report, including the management letter covering the audit observations on internal controls, will be

submitted to IFAD within six months of the end of the fiscal year. The appointment of the auditor shall be for a maximum period of 3 years, subject to satisfactory performance.

23. **Records management.** The PD under the MoA will maintain adequate filing and ensure proper back up of all project records. In accordance with IFAD General Conditions, the borrower has to maintain the original records for a minimum of 10 years after the project completion

24. **Implementing partners.** The project is foreseen to contract implementing partners to implement selected activities under the project. The FM arrangements related to the implementing partners is expected to be as follows:

    i. The PD will send out a call of interest.

    ii. All interested implementing partners will submit a proposal to the PD.

    iii. The PD will conduct a due diligence check of the implementing partner including the Financial Management capacity.

    iv. Subject to IFAD non objection, the PD will enter into a performance based contract with the selected implementing partner with well-defined performance/service standards.

    v. The performance milestones, criteria for measurement and the triggers for disbursement will be clearly specified in the contract. In addition, the contract/MoU will specify the financial reporting requirements and the associated timelines. All payments to the Implementing partners will be made against a duly certified disbursement request, a statement of expenditures and supporting documentation (either in original or certified copies) as required in accordance with the disbursement schedule of the agreement. The Payment request will be reviewed by the technical officer in the PD, ensuring that the performance milestones have been reached. Subject to the technical officer's clearance the payment is prepared by the Financial controller and Project management.

    Once the payment is approved the funds are transferred in to the implementing partner and duly recorded in the PD accounting software. All contracts with the implementing partners will include a provision requiring them to permit: (i) IFAD to inspect their accounts, records or other documents as part of the supervision missions, (ii) to have them audited by the project auditors as part of the annual project audit exercise; and (iii) promptly refund any ineligible expenditures or unused funds to the PD.

25. **Financial reporting by implementing partners.** Implementing partners will submit to the PD quarterly financial reports on both physical and financial progress in an agreed format. In addition, they will provide the PD with monthly expenditure reports using SOEs by expenditure category so as to facilitate the preparation of withdrawal applications each month, together with the necessary supporting documentation (in original or certified copies).

26. **Disbursement to implementing partners.** The implementing partners are expected to receive an initial advance based on disbursement applications and approved AWPBs, prepared by the chief accountant and signed by its management. The subsequent advances will be subject to justification of at least 75% of the immediately previous advance and 100% of all earlier advances, if any. In this regard the expenditures will be reported monthly to PD based on SOEs prepared on cash basis and signed by chief accountant and management and accompanied by bank statements any necessary supporting documentation as required by PD. The sizes of the initial and subsequent advances will depend on the implementing partner's budget forecast and financial management capacity including accounting systems.

B. IFAD disbursement procedures

27. The IFAD financing shall be disbursed against duly certified withdrawal applications in accordance with the IFAD disbursement procedures.

28. **IFAD disbursement procedures.** In accordance with the IFAD disbursement procedures between the date of entry into force of the Financing Agreement and the Financing Closing Date, the PD may request withdrawals from the Loan Account and/or Grant Accounts of amounts paid or to be paid for eligible expenditures. Accordingly, four standard disbursement procedures may be used for withdrawal of financing:

- Advance withdrawal;
- Direct payment;
- Special commitment; and
- Reimbursement.

29. **IFAD client portal.** At the moment, it is expected that all the IFAD client portal will be rolled out to the project in due course. In this regard the FM staff and the Project coordinator and other ministry staff assigned as assigned by the borrower will have official government email accounts and a smartphone for the soft token. However, as electronic signatures are not recognized in Lebanon, it is expected that the WA will be signed by hand, scanned and then submitted through the ICP to IFAD.

30. **Authorized allocation of the Designated account.** The Designated Accounts for the IFAD financing will be operated and replenished following the Imprest Account arrangements. After the IFAD financing has entered into force and the conditions for first disbursement have been duly complied with and upon request by the borrower, IFAD will make an initial deposit to the Designated Accounts equal to the requirements of eight months implementation (Authorized Allocation). The authorized allocation will be outlined in the Letter to the Borrower and is expected to be as follows:

- USD 800 000 under the IFAD loan;
- USD 200 000 under the IFAD grant; and
- USD 800 000 under the FARMS grant.

31. **Start-up Funds.** The project is estimated to receive USD 200,000 from the loan to incur expenditures related to the project start up before the satisfaction of the conditions precedent to withdrawal, The start-up funds will be used to for: (i) recruitment of the key staff, (ii) finalizing the Project implementation manual including the Financial procedures, accounting and procurement manual, (iii) preparation of the first AWPB & procurement plan, (iv) organization of a Start-up workshop, (v) procure and install Fine tune the accounting software, and (vi) finalization of the Agreement/MoUs templates with the implementing partners.

32. **Conditions for first withdrawal.** The following conditions related to financial management are to be met before the first withdrawal can be realized:

- IFAD has received from the Minister of Finance, – a letter designating the name(s) of official(s) authorized to sign withdrawal applications, which includes their authenticated specimen signature(s);
- IFAD has received documentation evidencing the opening of (i) MoF transit treasury subaccounts designated to receive IFAD Loan and grant proceeds; and (ii) the project specific designated accounts to be managed by the PD with advice of the persons/titles authorized to operate these accounts;

- Key Staff including the PD coordinator, Finance Manager, the accountant, and the procurement specialist have been duly appointed;
- A Project Implementation Manual including the Financial Administration and Accounting manual, has been approved by IFAD; and
- The IFAD no-objection on the first AWPB and procurement plan for the first 18 months of the project has been obtained.

33. Notwithstanding the above, no transfers can be made to the IPs before the Sub agreements with eth IPS have been approved by IFAD.

34. **Withdrawal applications.** The PD will compile and consolidate, on a timely basis, eligible project expenditures for activities. From these expenditures the PD will prepare withdrawal applications (WAs) for eligible project expenditures for submission to IFAD for reimbursement or replenishment. All WAs will be signed by the authorized signatories.

35. **Minimum withdrawal amounts.** In order to minimize transaction costs, the minimum withdrawal amounts are set as follows:

- Withdrawal Applications requesting replenishments of the Designated Account should at least cover a minimum amount of thirty per cent (30%) of the initial advance.
- Direct Payment method should only be used for payments of USD 100,000 and above while expenditures below USD 100,000 should be financed from the Designated Account if possible and claimed through the replenishment of the Designated Account.

36. **Statement of Expenditure (SOE).** The SOE thresholds shall be determined in the light of the associated risk for each expenditure category and will be duly documented in the Letter to the Borrower. The initial estimate is that the SOE threshold will be USD 50,000 for all contracts under all categories. The project will retain the relevant support documents and make them readily available for inspection and review by supervision missions and the auditors. These thresholds may be revised from time to time based on project performance and risk assessment.

C. Supervision, Implementation Support and Implementation Readiness

37. **Programme supervision.** The project will be directly supervised by IFAD. Supervision will not be conducted as a general inspection or evaluation, but rather as an opportunity to assess achievements and lessons jointly, and to reflect on ways to improve implementation and impact. From a financial management perspective, a financial management specialist will participate in missions annually to supervise and provide implementation support to the project and follow up the fiduciary risk at various levels including the use of the SOE.

38. **Supervision and implementation support plan.** In light of the risk assessment residual (medium FM risk), in the first two years of implementation the supervision plan of project will especially focus on the following actions:

- At least two on-site visits that will involve visits to the implementing partners (if any) and conducting/updating the FM assessment and conducting an FMA assessment of the implementing partners;
- Detailed review of adequacy of the staffing arrangements at the FM unit of the PD, including the TOR's and performance of the financial staff and identification of training needs;
- Detailed review of the Project financial management and accounting procedures in use;
- Detailed review of the accounting software and financial reports produced by the accounting software and the use of budget controls;

- Review of overall flow of funds (and resolving any bottlenecks) and a detailed review of the operation of the designated and project accounts (including monthly reconciliations).
- Detailed review of the fixed asset register and verification of (a) inventory reports and (b) assets through spot checks;
- Detailed review of the use of the Statement of Expenditure (SOE) procedure and the adequacy of supporting documentation for all expenditure items incurred by the PD and by the implementing partners;
- Detailed review of records management, filing and information back up;
- Follow-up on contracting the project (independent) external auditors and the ToRs; and
- Follow-up on work performed by the internal audit function.

39. The supervision process will be complemented by desk review of progress and financial reports, the programme's annual financial statements, internal audit reports, and annual audits.

Table: Implementation Readiness - A list of key tasks are summarized below

Action	By Whom	When	Conditionality
Agree on the Start-up funds (if any)	IFAD and the Borrower	As part of design	Negotiations.
Project implementation manual, Financial procedures manual, and procurement manual duly updated.	IFAD & PD	Start up	Start Up and disbursement condition.
Opening of Designated Account, and operational account.	Borrower/PD	Start up	Disbursement condition.
Format of the Quarterly/semi-annual Financial Reports and Annual Financial Statements to be agreed.	IFAD &PD	Start up	N/A
Finalise project draft LTB.	IFAD	As part of design	Negotiations.
Prepare first AWPB & procurement plan.	PD	By start-up	Disbursement condition.
Appointment of auditor under ToR and conditions acceptable to IFAD.	PD	Not later than 3 months after entry into force	Financing agreement schedule 3.
Procure the accounting software.	PD	Start up	N/A
Agree on the scope of work and the ToRs of the internal auditor as well as report format.	PD/IFAD	Start up	N/A
Agree on FM covenants to be included in the Agreement/MoUs with the implementing partners.	PD&IFAD	Start-up	N/A

Appendix 8: Procurement

1. Procurement of goods, works and services financed by IFAD Loan and Grant and FARMS fund shall be carried out in accordance with the IFAD Project Procurement Guidelines. Each AWPB must contain a procurement Plan, which shall identify procedures which must be implemented by the Recipient in order to ensure consistency with the IFAD Project Procurement Guidelines.

2. The following procurement methods are recommended:

A. Works

i. International Competitive Bidding: applies to contracts valued over USD 1,000,000 equivalent;

ii. National Competitive Bidding: applies to contracts valued over USD 100,000 equivalent up to and including USD 1,000,000 equivalent; and

iii. National Shopping: applies to contracts valued up to and including USD 100,000 equivalent.

B. Goods and Non-consultancy Services

i. International Competitive Bidding: applied to contracts valued over 200,000 equivalent;

ii. Limited International Bidding: applies to contracts valued up to and including USD 200,000 for highly specialized goods that are not available in country and availability is limited among small number of suppliers.

iii. National Competitive Bidding: applies to contracts valued over USD 75,000 equivalent up to and including USD 200,000 equivalent.

iv. National Shopping: applies to contracts valued up to and including USD 75,000 equivalent. For Contracts estimated to cost above USD 1,000 three quotations should be sought and evaluated. In the case of purchases estimated to cost USD 1,000 or below, no quotations shall be requested. Payments shall be made against invoice with an aggregate amount of USD 25,000 for the whole life time of the project.

v. Direct contracting: Direct contracting may be used for Suppliers under the Project only if it presents a clear advantage over competition or in case of standardization of equipment subject to IFAD prior approval.

B. Consultancy Services

3. The following processes will apply; any contract for the procurement of consultancy services may be awarded on the basis of Quality and Cost Based Selection (QCBS), Consultants Qualification (CQ), Quality Based Selection (QBS), Fixed Budget Selection (FBS), Least Cost Selection (LCS). The following processes will apply:

i. Request for Proposal (Internationally) - for contracts with a value over USD 300,000 equivalent;

ii. Request for Proposal (Nationally) - for contracts with a value up to and including USD 300,000 equivalent; and

iii. Single Source Selection (SSS): Single-source selection may be used for consultant firms under the Project only if it presents a clear advantage over competition or is estimated to cost less than USD 10,000 subject to IFAD prior approval.

Prior Review

4. In accordance with paragraph 80 of the IFAD Project Procurement Guidelines, the following will be subject to prior review by IFAD;

   i. First five contracts for works, and thereafter, award of any contract estimated to cost USD 50,000 equivalent or more;

   ii. First five contracts for goods and non-consultancy services, and thereafter, award of any contract estimated to cost USD 20,000 equivalent or more;

   iii. First five contracts for consultancy services, and thereafter award of any contract estimated to cost USD 20,000 equivalent or more in addition to the External Auditor contract;

   iv. All individual consultants contracts;

   v. Award of any contract through direct contracting, single source selection including selection of National Institutions and United Nations agencies;

   vi. All terms of References, Short-listing (if applicable) and draft contracts for consultancy contracts; and

The aforementioned thresholds may be modified by IFAD during the course of Project implementation.

5. All contracts must be listed in the Register of Contracts, which should be updates and submitted to the IFAD Country Programme Manager on a monthly basis.

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date **01/01/2018**

Procurement Plan

Consultancy services \ P1

No	Description	Lumpsum or Time based	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI Date published	Contract Date Contract signature Date	Remarks
				Loan	Grant									
Component No. 1														
C1	Subcontracting NGOs for additional extension Service delivery	LS	695186.0			695186.0			FBS	Prior	Plan	28-Jun-18	14-Dec-18	
											Actual			
C2	International Consultancy for System design	LS	20 452.00	20 452.00					QCBS	Prior	Plan	24-Apr-18	10-Oct-18	
											Actual			
C3	National Consultancy for system Design and re-vamping of software	LS	82 002.00	82 002.00					SSS	Prior	Plan	N/A	21-Jul-18	This Consultancy is to be undertaken by the firm who originally developped the system and hat is why it is SSS
											Actual			
Subtotal Component No. 1			**797 640.00**											

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date 01/01/2018

Procurement Plan

Consultancy services

No	Description	Lumpsum or Time based	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI Date published	Contract Date Contract signature Date	Remarks
				Loan	Grant									
Component No. 2														
C4	Baseline Survey	LS	54245.0		54245.0				CQS	Prior	Plan	14-Apr-18	25-Jul-18	
											Actual			
C5	Review of Poverty, targeting and gender	LS	43 396.00		43 396.00				CQS	Prior	Plan	14-May-18	24-Aug-18	
											Actual			
Subtotal Component No. 2			**97 641.00**											
Component No. 3														
C6	Improving access to employment in agriculture ad agro-processing	LS	560 780.00			560 780.00			FBS	Prior	Plan	14-May-18	30-Oct-18	
											Actual			
C7	External Audit for the project	LS	10 000.00						LCS	Prior	Plan	23-Jul-18	08-Jan-19	
											Actual			
Subtotal Component No. 3			**570 780.00**											
Total			**1 466 061.00**											

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date 01/01/2018

Procurement Plan

Individual Consultants \ P1

No	Description	Lump sum or Time based	Unit	Est. Unit Cost US$ (000)	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI Submission for IFAD No Objection	Contract signature Date	Remarks
						Loan	Grant									
Component No. 1																
IC1	Development of Exension and Training Material (incl. Graphic Design)	LS	Training material		21 948.00	21 948.00					IC	Prior	Plan	01-Apr-18	12-Jun-18	
													Actual			
IC2	Refresher training of AC staff on methodolodical and technical aspects	time based	person-day		76 569.00	76 569.00					IC	Prior	Plan	01-Apr-18	12-Jun-18	
													Actual			
IC3	Support to development of specialized TVET dairy curricula	time based	person-day		11 050.00			11 050.00			IC	Post	Plan	03-Oct-18	14-Dec-18	
													Actual			
IC4	Data entry and Maintenance of the system	time based	person-month	1875.9	112 554.00	112 554.00	-	-	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	
													Actual			
IC5	Sanitary mandate for surveillance and vaccination- contracting para veterinarians for the first two years	time based	person-day		197 430.00	-	-	197 430.00			IC	Prior	Plan	01-Apr-18	12-Jun-18	This package w ill result w ith more than one contract for more than one para veterinarian
													Actual			
IC6	Sanitary mandate for surveillance and vaccination- contracting veterinarians for the first two years	time based	person-day		282 044.00	-	-	282 044.00	-	-	IC	Prior	Plan	01-Apr-18	12-Jun-18	This package w ill result w ith more than one contract for more than one veterinarian
													Actual			

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date: 01/01/2018

Procurement Plan

Individual Consultants \ P2

No	Description	Lump sum or Time based	Unit	Est. Unit Cost US$ (000)	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI Submission for IFAD No Objection	Contract signature Date	Remarks
						Loan	Grant									
Component No. 1																
IC7	livestock extension Agents for the first two years	time based	person-day		314 519.00	314 519.00	-	-	-	-	IC	Prior	Plan	01-Apr-18	12-Jun-18	This package w ill result w ith more than one contract for more than one livestock extension agent
													Actual			
Subtotal Component No. 1					**1 016 114.00**											
Component No. 2																
IC8	Production of Training Material - on-farm dairy processing and off-farm dairy processing (incl. graphic design)	LS	Training material		26 416.00	16 173.00	-	8 194.00	2 049.00	-	IC	Prior	Plan	01-Apr-18	12-Jun-18	
													Actual			
IC9	Sanitary mandate for surveillance and vaccination- contracting veterinarians for the first two years	time based	person-day		282 044.00	-	-	282 044.00	-	-	IC	Prior	Plan	01-Apr-18	12-Jun-18	
													Actual			
IC10	Training of Trainers	time	person-		7 578.00	7 578.00	-	-	-	-	IC	Prior	Plan	01-Apr-18	12-Jun-18	for year 1 only
													Actual			
IC11	Training of Households processors and mid size processors	time based	person-day		47 957.00	47 957.00	-	-	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for year 2 only
													Actual			
IC12	Coaching and Mentoring	time based	person-day		69 619.00	47 519.00	-	22 100.00	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for year 2 only
													Actual			

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date: 01/01/2018

Procurement Plan

Individual Consultants \ P3

No	Description	Lump sum or Time based	Unit	Est. Unit Cost US$ (000)	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI Submission for IFAD No Objection	Contract signature Date	Remarks
						Loan	Grant									
Component No. 2																
IC13	Training of cooperatives	LS	person-		27 625.00	-	-	27 625.00	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for year 2 only
													Actual			
IC14	Coaching of cooperatives for Management and Access to Market	LS	person-day		5 525.00	-	-	5 525.00	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for year 2 only
													Actual			
IC15	TA for Sustainable dairy loan products	LS	2	79198	158 396.00	-	-	158 396.00	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for year 2 only
													Actual			
IC16	Training consultancy for smallholder financial literacy	LS	LS	44428.0	44 428.00	44 428.00	-	-	-	-	IC	Prior	Plan	08-Oct-18	19-Dec-18	for the whole asignment (3 years). It includes: Development of Financial Literacy module for extension workers, Ploting of Financial Literacy module for extension workers and Training of Trainers and extensionists on
													Actual			
IC17	Assessment under Rural finance Intelligence	LS	LS		97 459.00	97 459.00	-	-	-	-	IC	Prior	Plan	01-May-18	12-Jul-18	This contract covers all the items under C2-I.B.3 "Rural Finance Intelligence"
													Actual			
IC18	Rural Finance Management	time based	person-month	4173.78	75 128.00	75 128.00	-	-	-	-	IC	Prior	Plan	01-May-18	12-Jul-18	One contract for the 3 years. The first year covers 6 months only
													Actual			
Subtotal Component No. 2					**842 175.00**											

Project Title: Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP)

Loan/Grant no.:

Start date: 01/01/2018

Procurement Plan

Individual Consultants \ P4

No	Description	Lump sum or Time based	Unit	Est. Unit Cost US$ (000)	Total Cost	IFAD US$ (000)		FARMS US$ (000)	PB US$ (000)	Government US$ (000)	Selection Method	Prior/ Post Rev.	Plan vs Actual	REOI	Contract	Remarks
						Loan	Grant							Submission for IFAD No Objection	Contract signature Date	
Component No. 3																
IC19	Technical Assistance	LS	study		15499.0	0.0	0.0	15499.0	0.0	0.0	IC	Prior	Plan	01-May-18	12-Jul-18	
													Actual			
IC20	Annual M&E activities	time Based	person-month		32 906.00		32 906.00				IC	Prior	Plan	01-May-18	12-Jul-18	
													Actual			
IC21	Field work and Data Analysis (Senior researchers)	time Based	person-month		4 340.00	4 340.00					IC	Prior	Plan	01-May-18	12-Jul-18	
													Actual			
IC22	Field work and Data Analysis (Junior researchers)	time Based	person-month		2 170.00	2 170.00					IC	Prior	Plan	01-May-18	12-Jul-18	
													Actual			
IC23	Project Director	time Based	person-month	4367.06	314 428.00	0.00	0.00	0.00	0.00	314 428.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
IC24	Monitoring and Evaluation Officer	time Based	person-month	1364.71	98 259.00	0.00	0.00	0.00	0.00	98 259.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
IC25	Procurement Officer	time Based	person-month	2183.53	157 214.00	0.00	0.00	0.00	0.00	157 214.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	The value of the eac of these packages covers the 6 years how ever the Contract w ill be signed originally for a period of 1 year renew able annually based on performance
													Actual			
IC26	Financial Manager	time Based	person-month	1637.65	117 911.00	0.00	0.00	0.00	0.00	117 911.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
IC27	Accountant	time Based	person-month	1091.76	78 607.00	0.00	0.00	0.00	0.00	78 607.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
IC28	Administration Assistant	time Based	person-month	1091.76	78 607.00	0.00	0.00	0.00	0.00	78 607.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
IC29	Drivers	time Based	person-month	1310.11	94 328.00	0.00	0.00	0.00	0.00	94 328.00	IC	Prior	Plan	11-Jan-18	24-Mar-18	
													Actual			
Subtotal Component No. 3					**994 269.00**											
Total					**2 852 558.00**											

Appendix 9: Project cost and financing

A. Financing Summary Tables (USD million)

LEBANON										
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)				Procurement Method						
Procurement Arrangements	**International**	**National**	**Local**							
(US$ '000)	**Competitive**	**Competitive**	**Competitive**	**Consulting**	**International**	**Local**	**Direct**			
	Bidding	**Bidding**	**Bidding**	**Services**	**Shopping**	**Shopping**	**Contracting**	**Other**	**N.B.F.**	**Total**
Civil Works	-	-	-	-	-	-	-	-	-	
Vehicles	362	-	156	-	-	-	-	-	-	517
Equipment and Materials	-	84	2 079	-	9	14	-	-	-	2 185
International Technical Assistance	-	-	-	20	-	-	-	-	-	20
Local Technical Assistance	-	-	-	3 114	-	-	75	-	-	3 189
Studies and Workshops	-	430	-	-	-	-	460	232	-	1 123
Training	-	-	144	99	-	-	1 024	-	-	1 268
Salaries	-	-	-	-	-	-	-	-	2 279	2 279
Incentives	-	-	-	-	-	-	-	-	1 350	1 350
Operation and Maintenance	-	-	-	-	-	-	49	-	439	488
Total	362	514	2 378	3 234	9	14	1 609	232	4 068	12 420

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		**Procurement Method**					
Procurement Arrangements - Non ICB/LCB Aggregated as Other	**International Competitive Bidding**	**National Competitive Bidding**	**Local Competitive Bidding**	**Consulting Services**	**Other**	**N.B.F.**	**Total**
(US$ '000)							
Civil Works	-	-	-	-	-	-	
Vehicles	362	-	156	-	-	-	517
Equipment and Materials	-	84	2 079	-	23	-	2 185
International Technical Assistance	-	-	-	20	-	-	20
Local Technical Assistance	-	-	-	3 114	75	-	3 189
Studies and Workshops	-	430	-	-	693	-	1 123
Training	-	-	144	99	1 024	-	1 268
Salaries	-	-	-	-	-	2 279	2 279
Incentives	-	-	-	-	-	1 350	1 350
Operation and Maintenance	-	-	-	-	49	439	488
Total	362	514	2 378	3 234	1 864	4 068	12 420

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Procurement Accounts by Years							
(US$ '000)	**Totals Including Contingencies**						
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
Vehicles	465	52	-	-	-	-	517
Equipment and Materials	947	379	194	236	291	138	2 185
International Technical Assistance	20	-	-	-	-	-	20
Local Technical Assistance	297	668	683	502	513	525	3 189
Studies and Workshops	209	118	188	192	196	219	1 123
Training	215	354	206	175	163	155	1 268
Salaries	263	386	394	403	412	421	2 279
Incentives	105	254	234	265	243	248	1 350
Operation and Maintenance	53	86	83	90	87	89	488
Total	2 575	2 298	1 983	1 864	1 905	1 795	12 420

LEBANON															
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)															
Disbursement Accounts by Financiers														**Local**	
(US$ Million)	**IFAD LOAN**		**IFAD GRANT**		**The Government**		**FARMS**		**Beneficiaries**		**Total**		**For.**	**(Excl.**	**Duties &**
	Amount	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Exch.**	**Taxes)**	**Taxes**
A. Vehicles	0.4	68.0	-	-	0.2	32.0	-	-	-	-	0.5	4.2	0.4	-	0.2
B. Equipment and material	0.5	22.6	-	-	0.0	-	1.5	70.5	0.2	6.9	2.2	17.6	1.3	0.9	-
C. Technical Assistance	0.5	14.3	-	-	-	-	2.7	85.7	-	-	3.2	25.8	0.0	3.2	-
D. Studies	0.6	49.1	0.6	50.9	-	-	-	-	-	-	1.1	9.0	-	1.1	-
E. Training	0.5	41.3	-	-	0.0	-	0.7	58.7	-	-	1.3	10.2	0.2	1.0	-
F. Staff Salaries and incentives															
Salaries	0.9	39.7	-	-	1.4	60.3	-	-	-	-	2.3	18.3	-	2.3	-
Staff Incentives	1.4	100.0	-	-	-	-	-	-	-	-	1.4	10.9	-	1.4	-
Subtotal Staff Salaries and incentives	2.3	62.1	-	-	1.4	37.9	-	-	-	-	3.6	29.2	-	3.6	-
G. Operation & Maintenance															
O&M	0.3	53.5	-	-	0.2	46.5	-	-	-	-	0.5	3.9	0.1	0.4	-
Subtotal Operation & Maintenance	0.3	53.5	-	-	0.2	46.5	-	-	-	-	0.5	3.9	0.1	0.4	-
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2	12.4	100.0	2.0	10.2	0.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Components by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
1. enhancing competitiveness of smallholder dairy production	1.8	30.8	-	-	0.8	14.1	3.1	55.1	-	-	5.7	46.0	1.0	4.6	0.1
2. Improving small-scale value addition and access to market	1.9	52.1	0.3	8.4	0.0	-	1.3	35.4	0.2	4.1	3.7	29.8	0.7	3.0	-
3. Project Management and Support	1.2	40.2	0.3	8.7	1.0	31.9	0.6	19.2	-	-	3.0	24.2	0.3	2.7	0.0
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2	12.4	100.0	2.0	10.2	0.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Expenditure Accounts by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
I. Investment Costs															
A. Vehicles	0.4	68.0	-	-	0.2	32.0	-	-	-	-	0.5	4.2	0.4	-	0.2
B. Equipment and material	0.5	22.9	-	-	0.0	-	1.5	70.1	0.2	7.0	2.2	17.4	1.3	0.9	-
C. Technical Assistance															
1. International Technical Assistance	0.0	100.0	-	-	-	-	-	-	-	-	0.0	0.2	0.0	-	-
2. National Technical Assistance	0.4	13.8	-	-	-	-	2.7	86.2	-	-	3.2	25.7	-	3.2	-
Subtotal Technical Assistance	0.5	14.3	-	-	-	-	2.7	85.7	-	-	3.2	25.8	0.0	3.2	-
D. Studies	0.6	49.1	0.6	50.9	-	-	-	-	-	-	1.1	9.0	-	1.1	-
F. Training	0.5	40.4	-	-	0.0	-	0.8	59.6	-	-	1.3	10.4	0.3	1.0	-
Total Investment Costs	2.4	28.7	0.6	6.9	0.2	2.0	5.0	60.6	0.2	1.8	8.3	66.8	1.9	6.2	0.2
II. Recurrent Costs															
A. Salaries	0.9	46.1	-	-	1.1	53.9	-	-	-	-	2.0	15.8	-	2.0	-
B. Incentives	1.4	81.1	-	-	0.3	18.9	-	-	-	-	1.7	13.4	-	1.7	-
C. Operation and Maintenance	0.3	53.5	-	-	0.2	46.5	-	-	-	-	0.5	3.9	0.1	0.4	-
Total Recurrent Costs	2.5	61.1	-	-	1.6	38.9	-	-	-	-	4.1	33.2	0.1	4.0	-
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2	12.4	100.0	2.0	10.2	0.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Local/Foreign/Taxes by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. Foreign	0.8	41.0	-	-	0.0	2.2	1.0	52.3	0.1	4.5	2.0	16.1
II. Local (Excl. Taxes)	4.1	39.8	0.6	5.6	1.6	15.2	4.0	38.9	0.1	0.6	10.2	82.5
III. Taxes	-	-	-	-	0.2	100.0	-	-	-	-	0.2	1.3
Total Project	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2	12.4	100.0

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Procurement Accounts by Financiers

(US$ Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
Vehicles	0.4	68.0	-	-	0.2	32.0	-	-	-	-	0.5	4.2	0.4	-	0.2
Equipment and Materials	0.5	22.6	-	-	0.0	-	1.5	70.5	0.2	6.9	2.2	17.6	1.3	0.9	-
International Technical Assistance	0.0	100.0	-	-	-	-	-	-	-	-	0.0	0.2	0.0	-	-
Local Technical Assistance	0.4	13.8	-	-	-	-	2.7	86.2	-	-	3.2	25.7	-	3.2	-
Studies and Workshops	0.6	49.1	0.6	50.9	-	-	-	-	-	-	1.1	9.0	-	1.1	-
Training	0.5	41.3	-	-	0.0	-	0.7	58.7	-	-	1.3	10.2	0.2	1.0	-
Salaries	0.9	39.7	-	-	1.4	60.3	-	-	-	-	2.3	18.3	-	2.3	-
Incentives	1.4	100.0	-	-	-	-	-	-	-	-	1.4	10.9	-	1.4	-
Operation and Maintenance	0.3	53.5	-	-	0.2	46.5	-	-	-	-	0.5	3.9	0.1	0.4	-
Total PROJECT COSTS	4.9	39.4	0.6	4.6	1.8	14.2	5.0	40.5	0.2	1.2	12.4	100.0	2.0	10.2	0.2

LEBANON								
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)						**Costs to**		
Disbursements by Semesters and Government Cash Flow	**Financing Available**					**be**		
(US$ Million)	**IFAD**	**IFAD**				**Financed**	**The Government**	
	LOAN	**GRANT**	**FARMS**	**Beneficiaries**		**Project**	**Cash**	**Cumulative**
	Amount	**Amount**	**Amount**	**Amount**	**Total**	**Costs**	**Flow**	**Cash Flow**
1	-	-	-	-	-	1.3	-1.3	-1.3
2	0.5	0.1	0.4	0.0	1.1	1.3	-0.2	-1.5
3	0.5	0.1	0.4	0.0	1.1	1.1	-0.0	-1.5
4	0.4	0.0	0.5	0.0	1.0	1.1	-0.1	-1.6
5	0.4	0.0	0.5	0.0	1.0	1.0	0.0	-1.6
6	0.4	0.0	0.4	0.0	0.9	1.0	-0.1	-1.8
7	0.4	0.0	0.4	0.0	0.9	0.9	-0.1	-1.8
8	0.4	0.0	0.4	0.0	0.8	0.9	-0.1	-2.0
9	0.4	0.0	0.4	0.0	0.8	1.0	-0.2	-2.1
10	0.4	0.0	0.4	0.0	0.8	1.0	-0.1	-2.3
11	0.4	0.0	0.4	0.0	0.8	0.9	-0.1	-2.4
12	0.4	0.1	0.3	0.0	0.8	0.9	-0.1	-2.5
13	0.4	0.1	0.3	0.0	0.8	-	0.8	-1.8
Total	4.9	0.6	5.0	0.2	10.7	12.4	-1.8	-1.8

LEBANON				
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)				
Financing Plan				
(US$ Million)				
	Foreign	**Local**	**Total**	**Percent**
IFAD LOAN	0.8	4.1	4.9	39.4
IFAD GRANT	-	0.6	0.6	4.6
The Government	0.0	1.7	1.8	14.2
FARMS	1.0	4.0	5.0	40.5
Beneficiaries	0.1	0.1	0.2	1.2
Total	2.0	10.4	12.4	100.0

LEBANON								
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							%	% Total
Components Project Cost Summary		**(LBP)**			**(US$)**		**Foreign**	**Base**
	Local	**Foreign**	**Total**	**Local**	**Foreign**	**Total**	**Exchange**	**Costs**
1. enhancing competitiveness of smallholder dairy production	6 451 425 000	1 352 325 000	7 803 750 000	4 300 950	901 550	5 202 500	17	46
2. Improving small-scale value addition and access to market	3 985 260 000	989 160 000	4 974 420 000	2 656 840	659 440	3 316 280	20	30
3. Project Management and Support	3 667 440 000	404 760 000	4 072 200 000	2 444 960	269 840	2 714 800	10	24
Total BASELINE COSTS	14 104 125 000	2 746 245 000	16 850 370 000	9 402 750	1 830 830	11 233 580	16	100
Physical Contingencies	237 755 250	135 812 250	373 567 500	158 504	90 542	249 045	36	2
Price Contingencies	1 280 583 445	125 319 018	1 405 902 463	853 722	83 546	937 268	9	8
Total PROJECT COSTS	15 622 463 695	3 007 376 268	18 629 839 963	10 414 976	2 004 918	12 419 893	16	111

LEBANON								
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							%	% Total
Expenditure Accounts Project Cost Summary		**(LBP)**			**(US$)**		**Foreign**	**Base**
	Local	**Foreign**	**Total**	**Local**	**Foreign**	**Total**	**Exchange**	**Costs**
I. Investment Costs								
A. Vehicles	230 925 000	490 575 000	721 500 000	153 950	327 050	481 000	68	4
B. Equipment and material	1 169 100 000	1 753 650 000	2 922 750 000	779 400	1 169 100	1 948 500	60	17
C. Technical Assistance								
1. International Technical Assistance	-	30 000 000	30 000 000	-	20 000	20 000	100	-
2. National Technical Assistance	4 379 820 000	-	4 379 820 000	2 919 880	-	2 919 880	-	26
Subtotal Technical Assistance	4 379 820 000	30 000 000	4 409 820 000	2 919 880	20 000	2 939 880	1	26
D. Studies	1 467 000 000	-	1 467 000 000	978 000	-	978 000	-	9
F. Training	1 375 680 000	343 920 000	1 719 600 000	917 120	229 280	1 146 400	20	10
Total Investment Costs	8 622 525 000	2 618 145 000	11 240 670 000	5 748 350	1 745 430	7 493 780	23	67
II. Recurrent Costs								
A. Salaries	2 690 100 000	-	2 690 100 000	1 793 400	-	1 793 400	-	16
B. Incentives	2 279 100 000	-	2 279 100 000	1 519 400	-	1 519 400	-	14
C. Operation and Maintenance	512 400 000	128 100 000	640 500 000	341 600	85 400	427 000	20	4
Total Recurrent Costs	5 481 600 000	128 100 000	5 609 700 000	3 654 400	85 400	3 739 800	2	33
Total BASELINE COSTS	14 104 125 000	2 746 245 000	16 850 370 000	9 402 750	1 830 830	11 233 580	16	100
Physical Contingencies	237 755 250	135 812 250	373 567 500	158 504	90 542	249 045	36	2
Price Contingencies	1 280 583 445	125 319 018	1 405 902 463	853 722	83 546	937 268	9	8
Total PROJECT COSTS	15 622 463 695	3 007 376 268	18 629 839 963	10 414 976	2 004 918	12 419 893	16	111

LEBANON								
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							%	% Total
Detailed Cost Estimate by Expenditure Category		**(LBP)**			**(US$)**		**Foreign**	**Base**
	Foreign	**Local**	**Total**	**Foreign**	**Local**	**Total**	**Exchange**	**Costs**
A. Investment Costs								
1. Vehicles	490 575 000	-	490 575 000	327 050	-	327 050	100	3
2. Equipment and material	1 753 650 000	1 169 100 000	2 922 750 000	1 169 100	779 400	1 948 500	60	17
3. Technical Assistance								
a. International Technical Assistance	30 000 000	-	30 000 000	20 000	-	20 000	100	-
b. National Technical Assistance	-	4 379 820 000	4 379 820 000	-	2 919 880	2 919 880	-	26
Subtotal 3. Technical Assistance	30 000 000	4 379 820 000	4 409 820 000	20 000	2 919 880	2 939 880	1	26
4. Studies	-	1 467 000 000	1 467 000 000	-	978 000	978 000	-	9
6. Training	343 920 000	1 375 680 000	1 719 600 000	229 280	917 120	1 146 400	20	10
7. Duties & Taxes	-	230 925 000	230 925 000	-	153 950	153 950	-	1
Total Investment Costs	2 618 145 000	8 622 525 000	11 240 670 000	1 745 430	5 748 350	7 493 780	23	67
B. Recurrent Costs								
1. Salaries	-	2 690 100 000	2 690 100 000	-	1 793 400	1 793 400	-	16
2. Incentives	-	2 279 100 000	2 279 100 000	-	1 519 400	1 519 400	-	14
3. Operation and Maintenance	128 100 000	512 400 000	640 500 000	85 400	341 600	427 000	20	4
Total Recurrent Costs	128 100 000	5 481 600 000	5 609 700 000	85 400	3 654 400	3 739 800	2	33
Total BASELINE COSTS	2 746 245 000	14 104 125 000	16 850 370 000	1 830 830	9 402 750	11 233 580	16	100
Physical Contingencies	135 812 250	237 755 250	373 567 500	90 542	158 504	249 045	36	2
Price Contingencies	125 319 018	1 280 583 445	1 405 902 463	83 546	853 722	937 268	9	8
Total PROJECT COSTS	3 007 376 268	15 622 463 695	18 629 839 963	2 004 918	10 414 976	12 419 893	16	111

LEBANON						
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		Improving				
Expenditure Accounts by Components - Base Costs	**enhancing**	**small-scale**				
(US$)	**competitiveness**	**value**				
	of smallholder	**addition and**	**Project**		**Physical**	
	dairy	**access to**	**Management**		**Contingencies**	
	production	**market**	**and Support**	**Total**	**%**	**Amount**
I. Investment Costs						
A. Vehicles	385 000	-	96 000	481 000	5.0	24 050
B. Equipment and material	944 500	927 600	76 400	1 948 500	5.0	97 425
C. Technical Assistance						
1. International Technical Assistance	20 000	-	-	20 000	-	-
2. National Technical Assistance	2 309 000	595 880	15 000	2 919 880	-	-
Subtotal Technical Assistance	2 329 000	595 880	15 000	2 939 880	-	-
D. Studies	-	647 000	331 000	978 000	5.0	48 900
F. Training	125 000	471 400	550 000	1 146 400	5.0	57 320
Total Investment Costs	3 783 500	2 641 880	1 068 400	7 493 780	3.0	227 695
II. Recurrent Costs						
A. Salaries	1 221 000	-	572 400	1 793 400	-	-
B. Incentives	-	631 400	888 000	1 519 400	-	-
C. Operation and Maintenance	198 000	43 000	186 000	427 000	5.0	21 350
Total Recurrent Costs	1 419 000	674 400	1 646 400	3 739 800	0.6	21 350
Total BASELINE COSTS	5 202 500	3 316 280	2 714 800	11 233 580	2.2	249 045
Physical Contingencies	82 625	104 450	61 970	249 045	-	-
Price Contingencies	430 826	275 241	231 201	937 268	1.8	16 719
Total PROJECT COSTS	5 715 951	3 695 971	3 007 971	12 419 893	2.1	265 764
Taxes	144 687	-	20 770	165 457	4.8	7 879
Foreign Exchange	983 495	726 405	295 018	2 004 918	4.7	94 498

LEBANON				
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		**Improving**		
Expenditure Accounts by Components - Totals Including Contingencies	**enhancing**	**small-scale**		
(US$)	**competitiveness**	**value**		
	of smallholder	**addition and**	**Project**	
	dairy	**access to**	**Management**	
	production	**market**	**and Support**	**Total**
I. Investment Costs				
A. Vehicles	413 391	-	103 852	517 244
B. Equipment and material	1 046 606	1 027 401	82 477	2 156 484
C. Technical Assistance				
1. International Technical Assistance	20 452	-	-	20 452
2. National Technical Assistance	2 529 898	643 685	15 499	3 189 082
Subtotal Technical Assistance	2 550 350	643 685	15 499	3 209 534
D. Studies	-	739 962	382 716	1 122 678
F. Training	139 301	540 240	616 965	1 296 505
Total Investment Costs	4 149 648	2 951 288	1 201 509	8 302 445
II. Recurrent Costs				
A. Salaries	1 339 541	-	624 926	1 964 467
B. Incentives	-	695 355	969 487	1 664 843
C. Operation and Maintenance	226 762	49 327	212 049	488 138
Total Recurrent Costs	1 566 303	744 683	1 806 462	4 117 448
Total PROJECT COSTS	5 715 951	3 695 971	3 007 971	12 419 893
Taxes	144 687	-	20 770	165 457
Foreign Exchange	983 495	726 405	295 018	2 004 918

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Project Components by Year -- Base Costs							
(US$)				**Base Cost**			
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
1. enhancing competitiveness of smallholder dairy production	1 275 500	825 000	798 000	768 000	768 000	768 000	5 202 500
2. Improving small-scale value addition and access to market	456 350	810 440	665 190	548 900	549 700	285 700	3 316 280
3. Project Management and Support	683 500	501 700	348 400	348 400	348 400	484 400	2 714 800
Total BASELINE COSTS	2 415 350	2 137 140	1 811 590	1 665 300	1 666 100	1 538 100	11 233 580
Physical Contingencies	87 595	44 900	29 795	30 185	31 485	25 085	249 045
Price Contingencies	71 722	115 834	141 712	168 598	207 549	231 853	937 268
Total PROJECT COSTS	2 574 667	2 297 874	1 983 097	1 864 083	1 905 134	1 795 038	12 419 893
Taxes	154 995	10 463	-	-	-	-	165 457
Foreign Exchange	949 573	352 501	169 580	189 145	217 966	126 153	2 004 918

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Project Components by Year -- Totals Including Contingencies							
(US$)				**Totals Including Contingencies**			
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
1. enhancing competitiveness of smallholder dairy production	1 356 112	879 769	868 224	852 245	870 484	889 117	5 715 951
2. Improving small-scale value addition and access to market	491 819	876 373	733 698	622 417	636 803	334 862	3 695 971
3. Project Management and Support	726 735	541 732	381 175	389 422	397 848	571 059	3 007 971
Total PROJECT COSTS	2 574 667	2 297 874	1 983 097	1 864 083	1 905 134	1 795 038	12 419 893

B. Financing Summary Tables (LBP million)

LEBANON										
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)				Procurement Method						
Procurement Arrangements	**International**	**National**	**Local**							
(LBP Million)	**Competitive Bidding**	**Competitive Bidding**	**Competitive Bidding**	**Consulting Services**	**International Shopping**	**Local Shopping**	**Direct Contracting**	**Other**	**N.B.F.**	**Total**
Civil Works	-	-	-	-	-	-	-	-	-	
Vehicles	542	-	234	-	-	-	-	-	-	776
Equipment and Materials	-	126	3 118	-	14	21	-	-	-	3 278
International Technical Assistance	-	-	-	31	-	-	-	-	-	31
Local Technical Assistance	-	-	-	4 671	-	-	113	-	-	4 784
Studies and Workshops	-	645	-	-	-	-	691	349	-	1 684
Training	-	-	216	149	-	-	1 536	-	-	1 902
Salaries	-	-	-	-	-	-	-	-	3 418	3 418
Incentives	-	-	-	-	-	-	-	-	2 026	2 026
Operation and Maintenance	-	-	-	-	-	-	74	-	658	732
Total	542	770	3 568	4 851	14	21	2 414	349	6 102	18 630

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		**Procurement Method**					
Procurement Arrangements - Non ICB/LCB Aggregated as Other	**International Competitive Bidding**	**National Competitive Bidding**	**Local Competitive Bidding**	**Consulting Services**	**Other**	**N.B.F.**	**Total**
(LBP Million)							
Civil Works	-	-	-	-	-	-	
Vehicles	542	-	234	-	-	-	776
Equipment and Materials	-	126	3 118	-	34	-	3 278
International Technical Assistance	-	-	-	31	-	-	31
Local Technical Assistance	-	-	-	4 671	113	-	4 784
Studies and Workshops	-	645	-	-	1 039	-	1 684
Training	-	-	216	149	1 536	-	1 902
Salaries	-	-	-	-	-	3 418	3 418
Incentives	-	-	-	-	-	2 026	2 026
Operation and Maintenance	-	-	-	-	74	658	732
Total	542	770	3 568	4 851	2 797	6 102	18 630

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Procurement Accounts by Years

(LBP Million)	Totals Including Contingencies						
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
Vehicles	697	78	-	-	-	-	776
Equipment and Materials	1 421	569	290	354	436	207	3 278
International Technical Assistance	31	-	-	-	-	-	31
Local Technical Assistance	445	1 003	1 025	754	770	787	4 784
Studies and Workshops	314	176	282	288	295	328	1 684
Training	322	531	309	263	244	233	1 902
Salaries	394	579	592	605	618	631	3 418
Incentives	158	381	352	398	364	372	2 026
Operation and Maintenance	80	129	125	135	130	133	732
Total	3 862	3 447	2 975	2 796	2 858	2 693	18 630

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Disbursement Accounts by Financiers

(LBP Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total			Local (Excl.	Duties &
	Amount	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**For. Exch.**	**Taxes)**	**Taxes**
A. Vehicles	527.7	68.0	-	-	248.2	32.0	-	-	-	-	775.9	4.2	527.7	-	248.2
B. Equipment and material	741.6	22.6	-	-	0.0	-	2 309.5	70.5	226.8	6.9	3 277.9	17.6	1 933.2	1 344.7	-
C. Technical Assistance	689.6	14.3	-	-	-	-	4 124.7	85.7	-	-	4 814.3	25.8	30.7	4 783.6	-
D. Studies	826.8	49.1	857.2	50.9	-	-	-	-	-	-	1 684.0	9.0	-	1 684.0	-
E. Training	784.7	41.3	-	-	0.0	-	1 116.8	58.7	-	-	1 901.6	10.2	372.8	1 528.8	-
F. Staff Salaries and incentives															
Salaries	1 357.6	39.7	-	-	2 060.7	60.3	-	-	-	-	3 418.3	18.3	-	3 418.3	-
Staff Incentives	2 025.6	100.0	-	-	-	-	-	-	-	-	2 025.6	10.9	-	2 025.6	-
Subtotal Staff Salaries and incentives	3 383.3	62.1	-	-	2 060.7	37.9	-	-	-	-	5 444.0	29.2	-	5 444.0	-
G. Operation & Maintenance															
O&M	392.1	53.5	-	-	340.1	46.5	-	-	-	-	732.2	3.9	143.1	589.1	-
Subtotal Operation & Maintenance	392.1	53.5	-	-	340.1	46.5	-	-	-	-	732.2	3.9	143.1	589.1	-
Total PROJECT COSTS	7 345.8	39.4	857.2	4.6	2 649.0	14.2	7 551.1	40.5	226.8	1.2	18 629.8	100.0	3 007.4	15 374.3	248.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Components by Financiers

(LBP Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total			Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	For. Exch.	Taxes)	Taxes
1. enhancing competitiveness of smallholder dairy production	2 640.5	30.8	-	-	1 208.8	14.1	4 724.6	55.1	-	-	8 573.9	46.0	1 475.2	6 881.7	217.0
2. Improving small-scale value addition and access to market	2 889.9	52.1	465.2	8.4	0.0	-	1 962.0	35.4	226.8	4.1	5 544.0	29.8	1 089.6	4 454.3	-
3. Project Management and Support	1 815.4	40.2	391.9	8.7	1 440.2	31.9	864.4	19.2	-	-	4 512.0	24.2	442.5	4 038.3	31.2
Total PROJECT COSTS	7 345.8	39.4	857.2	4.6	2 649.0	14.2	7 551.1	40.5	226.8	1.2	18 629.8	100.0	3 007.4	15 374.3	248.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Expenditure Accounts by Financiers

(LBP Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total			Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	For. Exch.	Taxes)	Taxes
I. Investment Costs															
A. Vehicles	527.7	68.0	-	-	248.2	32.0	-	-	-	-	775.9	4.2	527.7	-	248.2
B. Equipment and material	741.6	22.9	-	-	0.0	-	2 266.3	70.1	226.8	7.0	3 234.7	17.4	1 924.7	1 310.0	-
C. Technical Assistance															
1. International Technical Assistance	30.7	100.0	-	-	-	-	-	-	-	-	30.7	0.2	30.7	-	-
2. National Technical Assistance	658.9	13.8	-	-	-	-	4 124.7	86.2	-	-	4 783.6	25.7	-	4 783.6	-
Subtotal Technical Assistance	689.6	14.3	-	-	-	-	4 124.7	85.7	-	-	4 814.3	25.8	30.7	4 783.6	-
D. Studies	826.8	49.1	857.2	50.9	-	-	-	-	-	-	1 684.0	9.0	-	1 684.0	-
F. Training	784.7	40.4	-	-	0.0	-	1 160.0	59.6	-	-	1 944.8	10.4	381.2	1 563.6	-
Total Investment Costs	3 570.5	28.7	857.2	6.9	248.2	2.0	7 551.1	60.6	226.8	1.8	12 453.7	66.8	2 864.3	9 341.2	248.2
II. Recurrent Costs															
A. Salaries	1 357.6	46.1	-	-	1 589.1	53.9	-	-	-	-	2 946.7	15.8	-	2 946.7	-
B. Incentives	2 025.6	81.1	-	-	471.6	18.9	-	-	-	-	2 497.3	13.4	-	2 497.3	-
C. Operation and Maintenance	392.1	53.5	-	-	340.1	46.5	-	-	-	-	732.2	3.9	143.1	589.1	-
Total Recurrent Costs	3 775.3	61.1	-	-	2 400.8	38.9	-	-	-	-	6 176.2	33.2	143.1	6 033.1	-
Total PROJECT COSTS	7 345.8	39.4	857.2	4.6	2 649.0	14.2	7 551.1	40.5	226.8	1.2	18 629.8	100.0	3 007.4	15 374.3	248.2

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Local/Foreign/Taxes by Financiers

(LBP Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. Foreign	1 231.7	41.0	-	-	66.4	2.2	1 574.3	52.3	135.0	4.5	3 007.4	16.1
II. Local (Excl. Taxes)	6 114.1	39.8	857.2	5.6	2 334.4	15.2	5 976.8	38.9	91.8	0.6	15 374.3	82.5
III. Taxes	-	-	-	-	248.2	100.0	-	-	-	-	248.2	1.3
Total Project	7 345.8	39.4	857.2	4.6	2 649.0	14.2	7 551.1	40.5	226.8	1.2	18 629.8	100.0

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Procurement Accounts by Financiers

(LBP Million)	IFAD LOAN		IFAD GRANT		The Government		FARMS		Beneficiaries		Total			Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	For. Exch.	Taxes)	Taxes
Vehicles	527.7	68.0	-	-	248.2	32.0	-	-	-	-	775.9	4.2	527.7	-	248.2
Equipment and Materials	741.6	22.6	-	-	0.0	-	2 309.5	70.5	226.8	6.9	3 277.9	17.6	1 933.2	1 344.7	-
International Technical Assistance	30.7	100.0	-	-	-	-	-	-	-	-	30.7	0.2	30.7	-	-
Local Technical Assistance	658.9	13.8	-	-	-	-	4 124.7	86.2	-	-	4 783.6	25.7	-	4 783.6	-
Studies and Workshops	826.8	49.1	857.2	50.9	-	-	-	-	-	-	1 684.0	9.0	-	1 684.0	-
Training	784.7	41.3	-	-	0.0	-	1 116.8	58.7	-	-	1 901.6	10.2	372.8	1 528.8	-
Salaries	1 357.6	39.7	-	-	2 060.7	60.3	-	-	-	-	3 418.3	18.3	-	3 418.3	-
Incentives	2 025.6	100.0	-	-	-	-	-	-	-	-	2 025.6	10.9	-	2 025.6	-
Operation and Maintenance	392.1	53.5	-	-	340.1	46.5	-	-	-	-	732.2	3.9	143.1	589.1	-
Total PROJECT COSTS	7 345.8	39.4	857.2	4.6	2 649.0	14.2	7 551.1	40.5	226.8	1.2	18 629.8	100.0	3 007.4	15 374.3	248.2

LEBANON								
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		Financing Available				Costs to be		
Disbursements by Semesters and Government Cash Flow		IFAD				Financed	The Government	
(LBP Million)	IFAD LOAN	GRANT	FARMS	Beneficiaries		Project		Cumulative
	Amount	Amount	Amount	Amount	Total	Costs	Cash Flow	Cash Flow
1	-	-	-	-	-	1 931.0	-1 931.0	-1 931.0
2	815.8	123.7	672.1	49.6	1 661.1	1 931.0	-269.9	-2 200.9
3	815.8	123.7	672.1	49.6	1 661.1	1 723.4	-62.3	-2 263.2
4	639.0	54.9	794.3	27.0	1 515.1	1 723.4	-208.3	-2 471.4
5	639.0	54.9	794.3	27.0	1 515.1	1 487.3	27.8	-2 443.6
6	576.9	56.1	644.7	4.8	1 282.5	1 487.3	-204.8	-2 648.4
7	576.9	56.1	644.7	4.8	1 282.5	1 398.1	-115.5	-2 764.0
8	565.1	57.3	556.0	10.4	1 188.8	1 398.1	-209.3	-2 973.2
9	565.1	57.3	556.0	10.4	1 188.8	1 428.9	-240.0	-3 213.3
10	538.5	58.6	599.4	18.5	1 215.0	1 428.9	-213.8	-3 427.1
11	538.5	58.6	599.4	18.5	1 215.0	1 346.3	-131.2	-3 558.3
12	537.6	78.0	509.0	3.1	1 127.8	1 346.3	-218.5	-3 776.8
13	537.6	78.0	509.0	3.1	1 127.8	-	1 127.8	-2 649.0
Total	7 345.8	857.2	7 551.1	226.8	15 980.8	18 629.8	-2 649.0	-2 649.0

LEBANON				
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)				
Financing Plan				
(LBP Million)				
	Foreign	Local	Total	Percent
IFAD LOAN	1 231.7	6 114.1	7 345.8	39.4
IFAD GRANT	-	857.2	857.2	4.6
The Government	66.4	2 582.6	2 649.0	14.2
FARMS	1 574.3	5 976.8	7 551.1	40.5
Beneficiaries	135.0	91.8	226.8	1.2
Total	3 007.4	15 622.5	18 629.8	100.0

LEBANON						
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		(LBP)				
Expenditure Accounts by Components - Base Costs		**Improving**				
	enhancing competitiveness of smallholder dairy production	**small-scale value addition and access to market**	**Project Management and Support**	**Total**	**Physical Contingencies %**	**Amount**
I. Investment Costs						
A. Vehicles	577 500 000	-	144 000 000	721 500 000	5.0	36 075 000
B. Equipment and material	1 416 750 000	1 391 400 000	114 600 000	2 922 750 000	5.0	146 137 500
C. Technical Assistance						
1. International Technical Assistance	30 000 000	-	-	30 000 000	-	-
2. National Technical Assistance	3 463 500 000	893 820 000	22 500 000	4 379 820 000	-	-
Subtotal Technical Assistance	3 493 500 000	893 820 000	22 500 000	4 409 820 000	-	-
D. Studies	-	970 500 000	496 500 000	1 467 000 000	5.0	73 350 000
F. Training	187 500 000	707 100 000	825 000 000	1 719 600 000	5.0	85 980 000
Total Investment Costs	5 675 250 000	3 962 820 000	1 602 600 000	11 240 670 000	3.0	341 542 500
II. Recurrent Costs						
A. Salaries	1 831 500 000	-	858 600 000	2 690 100 000	-	-
B. Incentives	-	947 100 000	1 332 000 000	2 279 100 000	-	-
C. Operation and Maintenance	297 000 000	64 500 000	279 000 000	640 500 000	5.0	32 025 000
Total Recurrent Costs	2 128 500 000	1 011 600 000	2 469 600 000	5 609 700 000	0.6	32 025 000
Total BASELINE COSTS	7 803 750 000	4 974 420 000	4 072 200 000	16 850 370 000	2.2	373 567 500
Physical Contingencies	123 937 500	156 675 000	92 955 000	373 567 500	-	-
Price Contingencies	646 239 049	412 861 504	346 801 910	1 405 902 463	1.8	25 078 855
Total PROJECT COSTS	8 573 926 549	5 543 956 504	4 511 956 910	18 629 839 963	2.1	398 646 355
Taxes	217 030 329	-	31 155 731	248 186 060	4.8	11 818 384
Foreign Exchange	1 475 242 240	1 089 607 165	442 526 863	3 007 376 268	4.7	141 747 519

LEBANON				
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)		**Improving**		
Expenditure Accounts by Components - Totals Including Contingencies	**enhancing**	**small-scale**		
(LBP)	**competitiveness**	**value addition**	**Project**	
	of smallholder	**and access to**	**Management and**	
	dairy production	**market**	**Support**	**Total**
I. Investment Costs				
A. Vehicles	620 086 655	-	155 778 653	775 865 307
B. Equipment and material	1 569 908 398	1 541 101 792	123 715 307	3 234 725 498
C. Technical Assistance				
1. International Technical Assistance	30 678 375	-	-	30 678 375
2. National Technical Assistance	3 794 846 970	965 528 104	23 247 945	4 783 623 019
Subtotal Technical Assistance	3 825 525 345	965 528 104	23 247 945	4 814 301 394
D. Studies	-	1 109 942 844	574 074 336	1 684 017 180
F. Training	208 951 279	810 359 786	925 447 043	1 944 758 108
Total Investment Costs	6 224 471 678	4 426 932 525	1 802 263 284	12 453 667 487
II. Recurrent Costs				
A. Salaries	2 009 311 720	-	937 389 448	2 946 701 168
B. Incentives	-	1 043 032 934	1 454 231 009	2 497 263 942
C. Operation and Maintenance	340 143 152	73 991 045	318 073 169	732 207 366
Total Recurrent Costs	2 349 454 872	1 117 023 979	2 709 693 625	6 176 172 476
Total PROJECT COSTS	8 573 926 549	5 543 956 504	4 511 956 910	18 629 839 963
Taxes	217 030 329	-	31 155 731	248 186 060
Foreign Exchange	1 475 242 240	1 089 607 165	442 526 863	3 007 376 268

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Project Components by Year -- Base Costs							
(LBP)				**Base Cost**			
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
1. enhancing competitiveness of smallholder dairy production	1 913 250 000	1 237 500 000	1 197 000 000	1 152 000 000	1 152 000 000	1 152 000 000	7 803 750 000
2. Improving small-scale value addition and access to market	684 525 000	1 215 660 000	997 785 000	823 350 000	824 550 000	428 550 000	4 974 420 000
3. Project Management and Support	1 025 250 000	752 550 000	522 600 000	522 600 000	522 600 000	726 600 000	4 072 200 000
Total BASELINE COSTS	3 623 025 000	3 205 710 000	2 717 385 000	2 497 950 000	2 499 150 000	2 307 150 000	16 850 370 000
Physical Contingencies	131 392 500	67 350 000	44 692 500	45 277 500	47 227 500	37 627 500	373 567 500
Price Contingencies	107 582 277	173 751 015	212 568 339	252 897 126	311 323 784	347 779 922	1 405 902 463
Total PROJECT COSTS	3 861 999 777	3 446 811 015	2 974 645 839	2 796 124 626	2 857 701 284	2 692 557 422	18 629 839 963
Taxes	232 492 230	15 693 830	-	-	-	-	248 186 060
Foreign Exchange	1 424 359 370	528 751 273	254 370 003	283 717 797	326 948 972	189 228 854	3 007 376 268

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Project Components by Year -- Totals Including Contingencies							
(LBP)				**Totals Including Contingencies**			
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
1. enhancing competitiveness of smallholder dairy production	2 034 168 688	1 319 653 886	1 302 335 656	1 278 367 017	1 305 725 966	1 333 675 335	8 573 926 549
2. Improving small-scale value addition and access to market	737 728 088	1 314 558 852	1 100 547 185	933 624 897	955 203 893	502 293 590	5 543 956 504
3. Project Management and Support	1 090 103 001	812 598 276	571 762 998	584 132 713	596 771 425	856 588 497	4 511 956 910
Total PROJECT COSTS	3 861 999 777	3 446 811 015	2 974 645 839	2 796 124 626	2 857 701 284	2 692 557 422	18 629 839 963

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Project Components by Year -- Investment/Recurrent Costs							
(LBP)			**Totals Including Contingencies**				
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
A. enhancing competitiveness of smallholder dairy production							
Investment Costs	1 832 901 754	908 345 447	882 060 824	848 929 767	866 925 980	885 307 905	6 224 471 678
Recurrent Costs	201 266 934	411 308 439	420 274 832	429 437 250	438 799 986	448 367 430	2 349 454 872
Subtotal enhancing competitiveness of smallholder dairy production	2 034 168 688	1 319 653 886	1 302 335 656	1 278 367 017	1 305 725 966	1 333 675 335	8 573 926 549
B. Improving small-scale value addition and access to market							
Investment Costs	735 015 827	1 073 463 389	898 900 452	681 855 826	747 579 163	290 117 868	4 426 932 525
Recurrent Costs	2 712 260	241 095 463	201 646 733	251 769 071	207 624 730	212 175 722	1 117 023 979
Subtotal Improving small-scale value addition and access to market	737 728 088	1 314 558 852	1 100 547 185	933 624 897	955 203 893	502 293 590	5 543 956 504
C. Project Management and Support							
Investment Costs	662 522 103	375 680 499	125 303 979	127 923 609	130 598 815	380 234 280	1 802 263 284
Recurrent Costs	427 580 898	436 917 777	446 459 019	456 209 104	466 172 610	476 354 218	2 709 693 625
Subtotal Project Management and Support	1 090 103 001	812 598 276	571 762 998	584 132 713	596 771 425	856 588 497	4 511 956 910
Total PROJECT COSTS	3 861 999 777	3 446 811 015	2 974 645 839	2 796 124 626	2 857 701 284	2 692 557 422	18 629 839 963
Total Investment Costs	3 230 439 684	2 357 489 336	1 906 265 256	1 658 709 202	1 745 103 957	1 555 660 053	12 453 667 487
Total Recurrent Costs	631 560 092	1 089 321 679	1 068 380 583	1 137 415 425	1 112 597 327	1 136 897 370	6 176 172 476

LEBANON									
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)									
Expenditure Accounts by Years -- Base Costs									
(LBP)				**Base Cost**				**Foreign Exchange**	
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**	**%**	**Amount**
I. Investment Costs									
A. Vehicles	649 500 000	72 000 000	-	-	-	-	721 500 000	68.0	490 575 000
B. Equipment and material	1 318 050 000	510 900 000	252 450 000	303 450 000	369 450 000	168 450 000	2 922 750 000	60.0	1 753 650 000
C. Technical Assistance									
1. International Technical Assistance	30 000 000	-	-	-	-	-	30 000 000	100.0	30 000 000
2. National Technical Assistance	430 950 000	949 560 000	949 560 000	683 250 000	683 250 000	683 250 000	4 379 820 000	-	-
Subtotal Technical Assistance	460 950 000	949 560 000	949 560 000	683 250 000	683 250 000	683 250 000	4 409 820 000	0.7	30 000 000
D. Studies	289 500 000	159 000 000	249 000 000	249 000 000	249 000 000	271 500 000	1 467 000 000	-	-
F. Training	297 300 000	488 100 000	281 400 000	236 100 000	215 100 000	201 600 000	1 719 600 000	20.0	343 920 000
Total Investment Costs	3 015 300 000	2 179 560 000	1 732 410 000	1 471 800 000	1 516 800 000	1 324 800 000	11 240 670 000	23.3	2 618 145 000
II. Recurrent Costs									
A. Salaries	309 600 000	476 100 000	476 100 000	476 100 000	476 100 000	476 100 000	2 690 100 000	-	-
B. Incentives	224 625 000	433 050 000	397 875 000	433 050 000	395 250 000	395 250 000	2 279 100 000	-	-
C. Operation and Maintenance	73 500 000	117 000 000	111 000 000	117 000 000	111 000 000	111 000 000	640 500 000	20.0	128 100 000
Total Recurrent Costs	607 725 000	1 026 150 000	984 975 000	1 026 150 000	982 350 000	982 350 000	5 609 700 000	2.3	128 100 000
Total BASELINE COSTS	3 623 025 000	3 205 710 000	2 717 385 000	2 497 950 000	2 499 150 000	2 307 150 000	16 850 370 000	16.3	2 746 245 000
Physical Contingencies	131 392 500	67 350 000	44 692 500	45 277 500	47 227 500	37 627 500	373 567 500	36.4	135 812 250
Price Contingencies	107 582 277	173 751 015	212 568 339	252 897 126	311 323 784	347 779 922	1 405 902 463	8.9	125 319 018
Total PROJECT COSTS	3 861 999 777	3 446 811 015	2 974 645 839	2 796 124 626	2 857 701 284	2 692 557 422	18 629 839 963	16.1	3 007 376 268
Taxes	232 492 230	15 693 830	-	-	-	-	248 186 060	-	-
Foreign Exchange	1 424 359 370	528 751 273	254 370 003	283 717 797	326 948 972	189 228 854	3 007 376 268	-	-

LEBANON							
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Expenditure Accounts by Years -- Totals Including Contingencies							
(LBP)			**Totals Including Contingencies**				
	Yr 1	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Total**
I. Investment Costs							
A. Vehicles	697 396 160	78 469 148	-	-	-	-	775 865 307
B. Equipment and material	1 421 131 415	560 671 040	281 982 660	344 995 892	427 530 556	198 413 935	3 234 725 498
C. Technical Assistance							
1. International Technical Assistance	30 678 375	-	-	-	-	-	30 678 375
2. National Technical Assistance	445 275 640	1 002 710 030	1 024 769 650	753 588 703	770 167 654	787 111 342	4 783 623 019
Subtotal Technical Assistance	475 954 015	1 002 710 030	1 024 769 650	753 588 703	770 167 654	787 111 342	4 814 301 394
D. Studies	314 079 737	176 294 746	282 158 079	288 365 556	294 709 598	328 409 464	1 684 017 180
F. Training	321 878 357	539 344 373	317 354 867	271 759 051	252 696 148	241 725 312	1 944 758 108
Total Investment Costs	3 230 439 684	2 357 489 336	1 906 265 256	1 658 709 202	1 745 103 957	1 555 660 053	12 453 667 487
II. Recurrent Costs							
A. Salaries	319 891 723	502 748 900	513 809 375	525 113 182	536 665 672	548 472 316	2 946 701 168
B. Incentives	232 091 984	457 289 248	429 388 585	477 631 303	445 530 575	455 332 248	2 497 263 942
C. Operation and Maintenance	79 576 385	129 283 531	125 182 623	134 670 940	130 401 081	133 092 806	732 207 366
Total Recurrent Costs	631 560 092	1 089 321 679	1 068 380 583	1 137 415 425	1 112 597 327	1 136 897 370	6 176 172 476
Total PROJECT COSTS	3 861 999 777	3 446 811 015	2 974 645 839	2 796 124 626	2 857 701 284	2 692 557 422	18 629 839 963

LEBANON																		
Harmonized Actions for Livestock Enhanced Production an																		Physical Cont.
Expenditure Accounts Breakdown		**Base Cost**				**Physical Contingencies**				**Price Contingencies**				**Total Incl. Cont.**			**Base Costs +**	**Plus Price**
(LBP)		**Local (Excl.**	**Duties &**			**Local (Excl.**	**Duties &**			**Local (Excl.**	**Duties &**			**Local (Excl.**	**Duties &**		**Price Cont. on**	**Cont. on**
	For. Exch.	**Taxes)**	**Taxes**	**Total**	**For. Exch.**	**Taxes)**	**Taxes**	**Total**	**For. Exch.**	**Taxes)**	**Taxes**	**Total**	**For. Exch.**	**Taxes)**	**Taxes**	**Total**	**Base Costs**	**Physical Cont.**
I. Investment Costs																		
A. Vehicles	490 575 000	-	230 925 000	721 500 000	24 528 750	-	11 546 250	36 075 000	12 575 498	-	5 714 810	18 290 307	527 679 248	-	248 186 060	775 865 307	738 919 340	36 945 967
B. Equipment and material	1 753 650 000	1 169 100 000	-	2 922 750 000	87 682 500	58 455 000	-	146 137 500	83 412 713	82 425 285	-	165 837 998	1 924 745 213	1 309 980 285	-	3 234 725 498	3 080 690 950	154 034 548
C. Technical Assistance																		
1. International Technical Assistance	30 000 000	-	-	30 000 000	-	-	-	-	678 375	-	-	678 375	30 678 375	-	-	30 678 375	30 678 375	-
2. National Technical Assistance	-	4 379 820 000	-	4 379 820 000	-	-	-	-	-	403 803 019	-	403 803 019	-	4 783 623 019	-	4 783 623 019	4 783 623 019	-
Subtotal Technical Assistance	30 000 000	4 379 820 000	-	4 409 820 000	-	-	-	-	678 375	403 803 019	-	404 481 394	30 678 375	4 783 623 019	-	4 814 301 394	4 814 301 394	-
D. Studies	-	1 467 000 000	-	1 467 000 000	-	73 350 000	-	73 350 000	-	143 667 180	-	143 667 180	-	1 684 017 180	-	1 684 017 180	1 603 825 886	80 191 294
F. Training	343 920 000	1 375 680 000	-	1 719 600 000	17 196 000	68 784 000	-	85 980 000	20 060 927	119 117 181	-	139 178 108	381 176 927	1 563 581 181	-	1 944 758 108	1 852 150 579	92 607 529
Total Investment Costs	2 618 145 000	8 391 600 000	230 925 000	11 240 670 000	129 407 250	200 589 000	11 546 250	341 542 500	116 727 512	749 012 665	5 714 810	871 454 987	2 864 279 762	9 341 201 665	248 186 060	12 453 667 487	12 089 888 149	363 779 338
II. Recurrent Costs																		
A. Salaries	-	2 690 100 000	-	2 690 100 000	-	-	-	-	-	256 601 168	-	256 601 168	-	2 946 701 168	-	2 946 701 168	2 946 701 168	-
B. Incentives	-	2 279 100 000	-	2 279 100 000	-	-	-	-	-	218 163 942	-	218 163 942	-	2 497 263 942	-	2 497 263 942	2 497 263 942	-
C. Operation and Maintenance	128 100 000	512 400 000	-	640 500 000	6 405 000	25 620 000	-	32 025 000	8 591 506	51 090 860	-	59 682 366	143 096 506	589 110 860	-	732 207 366	697 340 349	34 867 017
Total Recurrent Costs	128 100 000	5 481 600 000	-	5 609 700 000	6 405 000	25 620 000	-	32 025 000	8 591 506	525 855 970	-	534 447 476	143 096 506	6 033 075 970	-	6 176 172 476	6 141 305 459	34 867 017
Total	2 746 245 000	13 873 200 000	230 925 000	16 850 370 000	135 812 250	226 209 000	11 546 250	373 567 500	125 319 018	1 274 868 635	5 714 810	1 405 902 463	3 007 376 268	15 374 277 635	248 186 060	18 629 839 963	18 231 193 608	398 646 355

C. Detailed Base Costs (USD)

LEBANON																
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)																
Table 1. C1: Enhancing competitiveness of smallholder dairy production:																
Detailed Costs																
(US$)					Quantities								Base Cost			
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**	**Unit Cost**	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																
A. Extension																
1. logistical support																
vehicles for extension	Unit	5	-	-	-	-	-	5	24,000	120 000	-	-	-	-	-	120 000
vehicles for supervision (National level)	Unit	1	-	-	-	-	-	1	25,000	25 000	-	-	-	-	-	25 000
equipment for extension	LS	31	-	-	-	-	-	31	7,000	217 000	-	-	-	-	-	217 000
Subtotal logistical support										362 000	-	-	-	-	-	362 000
2. Preparation and production of training and learning materials																
development of extension and training material (incl. graphic design)	LS	-	1	-	-	-	-	1	17,000	-	17 000	-	-	-	-	17 000
production of extension and training material	Unit	5 000	-	-	-	-	-	5 000	5	25 000	-	-	-	-	-	25 000
Subtotal Preparation and production of training and learning materials										25 000	17 000	-	-	-	-	42 000
3. refresher training of AC staff on methodological and technical aspects	LS	1	1	1	-	-	-	3	30,000	30 000	30 000	30 000	-	-	-	90 000
4. subcontracting NGOs for additional extension service delivery	LS per province	-	7	7	7	7	7	35	19,000	-	133 000	133 000	133 000	133 000	133 000	665 000
Subtotal Extension										417 000	180 000	163 000	133 000	133 000	133 000	1 159 000
B. TVET																
1. Selection of TVET participants	5	-	1	1	1	1	1	5	5,000	-	5 000	5 000	5 000	5 000	5 000	25 000
2. Support to development of specialized TVET dairy curricula	LS	-	1	-	-	-	-	1	10,000	-	10 000	-	-	-	-	10 000
Subtotal TVET										-	15 000	5 000	5 000	5 000	5 000	35 000
C. Animal health																
1. Revamping the national surveillance system and animal health database																
International consultancy for system design	LS	1	-	-	-	-	-	1	20,000	20 000	-	-	-	-	-	20 000
National consultancy for implementation support	LS	-	1	1	1	1	1	5	9,000	-	9 000	9 000	9 000	9 000	9 000	45 000
re-vamping of softw are	LS	1	-	-	-	-	-	1	20,000	20 000	-	-	-	-	-	20 000
Server	server	1	-	-	-	-	-	1	12,000	12 000	-	-	-	-	-	12 000
Computer sets	computers	20	-	-	-	-	-	20	1,700	34 000	-	-	-	-	-	34 000
Vehicles for surveillance and vaccination	vehicle	10	-	-	-	-	-	10	24,000	240 000	-	-	-	-	-	240 000
data entry & maintainance of the system	perso-month	-	12	12	12	12	12	60	1,000	-	12 000	12 000	12 000	12 000	12 000	60 000
Ear tags	unit	100 000	25 000	25 000	25 000	25 000	25 000	225 000	1	70 000	17 500	17 500	17 500	17 500	17 500	157 500
Subtotal Revamping the national surveillance system and animal health database										396 000	38 500	38 500	38 500	38 500	38 500	588 500
2. Providing laboratory kits for surveillance																
post vaccination sero monitoring kits	LS	1	1	1	1	1	1	6	38,000	38 000	38 000	38 000	38 000	38 000	38 000	228 000
sero surveillance kits and sample collection equipement	LS	1	1	1	1	1	1	6	39,000	39 000	39 000	39 000	39 000	39 000	39 000	234 000
Subtotal Providing laboratory kits for surveillance										77 000	77 000	77 000	77 000	77 000	77 000	462 000
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases																
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	man day	2 700	2 700	2 700	2 700	2 700	2 700	16 200	40	108 000	108 000	108 000	108 000	108 000	108 000	648 000
Sanitary mandate for surveillance and vaccination- contracting veterinarians	man day	2 700	2 700	2 700	2 700	2 700	2 700	16 200	55	148 500	148 500	148 500	148 500	148 500	148 500	891 000
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases										256 500	256 500	256 500	256 500	256 500	256 500	1 539 000
Subtotal Animal health										729 500	372 000	372 000	372 000	372 000	372 000	2 589 500
Total Investment Costs										1 146 500	567 000	540 000	510 000	510 000	510 000	3 783 500
II. Recurrent Costs																
A. strengthening Agricultural Centers' specialized human resources																
Contracted livestock extension agents	pers-year	5	10	10	10	10	10	55	15,000	75 000	150 000	150 000	150 000	150 000	150 000	825 000
B. Improving the animal health status of the dairy herd and flock																
1. Salary drivers	pers-month	60	120	120	120	120	120	660	600	36 000	72 000	72 000	72 000	72 000	72 000	396 000
2. Running costs vehicles	vehicle month	60	120	120	120	120	120	660	300	18 000	36 000	36 000	36 000	36 000	36 000	198 000
Subtotal Improving the animal health status of the dairy herd and flock										54 000	108 000	108 000	108 000	108 000	108 000	594 000
Total Recurrent Costs										129 000	258 000	258 000	258 000	258 000	258 000	1 419 000
Total										1 275 500	825 000	798 000	768 000	768 000	768 000	5 202 500

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs

(US$)		Quantities							Base Cost							
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**	**Unit Cost**	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																
A. Supporting aggregation and value addition																
1. On farm dairy processing																
a. Production of training material (incl. graphic design)	LS	1	-	-	-	-	-	1	9,500	9 500	-	-	-	-	-	9 500
b. Printing of training material	copies	1 400	-	-	-	-	-	1 400	10	14 000	-	-	-	-	-	14 000
c. Equipment for training and demonstration purposes /a	Unit	12	12	-	-	-	-	24	2,000	24 000	24 000	-	-	-	-	48 000
d. Thermometer	Ea	1 000	1 000	1 000	1 000	1 000	1 000	6 000	5	5 000	5 000	5 000	5 000	5 000	5 000	30 000
e. Milk cans /b	Units	1 500	1 500	-	-	-	-	3 000	100	150 000	150 000	-	-	-	-	300 000
f. Cheese press	Units	-	-	50	150	300	-	500	300	-	-	15 000	45 000	90 000	-	150 000
g. Dairy culture	Pouch	-	300	300	400	450	500	1 950	20	-	6 000	6 000	8 000	9 000	10 000	39 000
h. Training equipment kit	LS	7	-	-	-	-	-	7	600	4 200	-	-	-	-	-	4 200
i. Supplies for training	LS	-	14	14	14	14	14	70	200	-	2 800	2 800	2 800	2 800	2 800	14 000
j. Lactoscan /c	Ea	7	-	-	-	-	-	7	1,200	8 400	-	-	-	-	-	8 400
k. pH/EC meter /d	Ea	7	-	-	-	-	-	7	180	1 260	-	-	-	-	-	1 260
l. Training of trainers																
Honorarium	day	7	-	7	-	-	-	14	300	2 100	-	2 100	-	-	-	4 200
m. Training of Households processors																
Trainers fees (household producers)	days	-	98	98	98	98	98	490	300	-	29 400	29 400	29 400	29 400	29 400	147 000
n. Coaching and mentoring																
coach/trainer fees	days	-	150	150	150	150	150	750	300	-	45 000	45 000	45 000	45 000	45 000	225 000
o. Training of trainers																
Honorarium	day	7	-	7	-	-	-	14	300	2 100	-	2 100	-	-	-	4 200
Subtotal On farm dairy processing										220 560	262 200	107 400	135 200	181 200	92 200	998 760
2. Off farm dairy processing /e																
a. Preparation and production of training and learning materials																
Development of training material	LS	1	-	-	-	-	-	1	10,000	10 000	-	-	-	-	-	10 000
Printing of training material	copies	1 000	-	-	-	-	-	1 000	8	8 000	-	-	-	-	-	8 000
Supplies for training	LS	-	8	-	8	-	-	16	250	-	2 000	-	2 000	-	-	4 000
Subtotal Preparation and production of training and learning materials										18 000	2 000	-	2 000	-	-	22 000
b. Equipment for processing units																
Lactoscan	Ea	80	-	-	-	-	-	80	1,200	96 000	-	-	-	-	-	96 000
pH/EC meter /f	Ea	80	-	-	-	-	-	80	200	16 000	-	-	-	-	-	16 000
Thermometer	Ea	80	-	-	-	-	-	80	3	240	-	-	-	-	-	240
Dairy culture	Box	60	-	-	-	-	-	60	100	6 000	-	-	-	-	-	6 000
Subtotal Equipment for processing units										118 240	-	-	-	-	-	118 240
c. Coaching and mentoring																
coach/trainer fees	days	-	80	80	80	80	80	400	250	-	20 000	20 000	20 000	20 000	20 000	100 000
d. Training of small and mid size processors																
Trainers fees (processors)	days	-	56	-	56	-	-	112	250	-	14 000	-	14 000	-	-	28 000
Subtotal Off farm dairy processing										136 240	36 000	20 000	36 000	20 000	20 000	268 240
3. Supporting access to market																
a. Development of a quality label for Lebanese cottage dairy products	LS	-	-	1	1	1	-	3	45,000	-	-	45 000	45 000	45 000	-	135 000
b. Support product aggregation through improved operationality of cooperatives																
Training of cooperatives	training session	-	5	5	5	5	5	25	5,000	-	25 000	25 000	25 000	25 000	25 000	125 000
coaching of cooperatives for management and access to market	LS	-	1	1	1	1	1	5	5,000	-	5 000	5 000	5 000	5 000	5 000	25 000
Subtotal Support product aggregation through improved operationality of cooperatives										-	30 000	30 000	30 000	30 000	30 000	150 000
Subtotal Supporting access to market										-	30 000	75 000	75 000	75 000	30 000	285 000
4. Renew able energy applied to the dairy sectors /g	LS	-	-	1	1	1	-	3	100,000	-	-	100 000	100 000	100 000	-	300 000
Subtotal Supporting aggregation and value addition										356 800	328 200	302 400	346 200	376 200	142 200	1 852 000

B. Improvement of access to Rural Finance																	
1. Sustainable dairy loan product(s)																	
Facilitated Dairy Market and Inclusive Finance Workshop	LS	-	1	-	-	-	-	1	20,000	-	20 000	-	-	-	-	20 000
Technical Assistance	TA	-	2	2	-	-	-	4	75,000	-	150 000	150 000	-	-	-	300 000
Subtotal Sustainable dairy loan product(s)										-	170 000	150 000	-	-	-	320 000
2. Smallholder financial literacy																
Development of Financial Literacy module for extension w orkers	LS	-	1	-	-	-	-	1	15,000	-	15 000	-	-	-	-	15 000
Piloting of Financial Literacy module for extension w orkers	LS	-	1	-	-	-	-	1	13,000	-	13 000	-	-	-	-	13 000
Training of Trainers and extensionists on financial literacy	LS	-	-	1	-	-	-	1	10,000	-	-	10 000	-	-	-	10 000
Subtotal Smallholder financial literacy										-	28 000	10 000	-	-	-	38 000
3. Rural Finance Intelligence																
a. Assessment of inclusive rural finance																
Research	LS	1	-	-	-	-	-	1	35,000	35 000	-	-	-	-	-	35 000
Production	LS	-	1	-	-	-	-	1	7,000	-	7 000	-	-	-	-	7 000
Distribution	LS	-	1	-	-	-	-	1	10,000	-	10 000	-	-	-	-	10 000
Subtotal Assessment of inclusive rural finance										35 000	17 000	-	-	-	-	52 000
b. Assessment of smallholder dairy financing																
Research	LS	-	1	-	-	-	-	1	20,000	-	20 000	-	-	-	-	20 000
Production	LS	-	1	-	-	-	-	1	7,000	-	7 000	-	-	-	-	7 000
Distribution	LS	-	1	-	-	-	-	1	10,000	-	10 000	-	-	-	-	10 000
Subtotal Assessment of smallholder dairy financing										-	37 000	-	-	-	-	37 000
Subtotal Rural Finance Intelligence										35 000	54 000	-	-	-	-	89 000
4. Rural finance management /h	LS									15 800	27 540	27 540	-	-	-	70 880
Subtotal Improvement of access to Rural Finance										50 800	279 540	187 540	-	-	-	517 880
C. Supporting a dairy stakeholder platform for inclusive policy dialogue																
Initial national w orkshop	LS w orkshop	1	-	-	-	-	-	1	40,000	40 000	-	-	-	-	-	40 000
meetings of national platform	meeting	7	21	21	21	21	21	112	1,000	7 000	21 000	21 000	21 000	21 000	21 000	112 000
meetings of regional platform /i	LS study	-	1	1	1	1	-	4	30,000	-	30 000	30 000	30 000	30 000	-	120 000
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue										47 000	51 000	51 000	51 000	51 000	21 000	272 000
Total Investment Costs										454 600	658 740	540 940	397 200	427 200	163 200	2 641 880
II. Recurrent Costs																
A. Supporting aggregation and value addition																
1. On farm dairy processing																
a. Coaching and mentoring																
Perdiem and transport of coaches/trainers	month	-	150	150	150	150	150	750	50	-	7 500	7 500	7 500	7 500	7 500	37 500
b. Training of Households processors																
Perdiem and transport of participants	day/paticipant	-	2 000	2 000	2 000	2 000	2 000	10 000	50	-	100 000	100 000	100 000	100 000	100 000	500 000
Perdiem and transport of trainers	days	-	80	80	80	80	80	400	50	-	4 000	4 000	4 000	4 000	4 000	20 000
Renting facility	LS	-	14	14	14	14	14	70	500	-	7 000	7 000	7 000	7 000	7 000	35 000
Subtotal Training of Households processors										-	111 000	111 000	111 000	111 000	111 000	555 000
c. Training of trainers																
Perdiem	day	7	-	7	-	-	-	14	250	1 750	-	1 750	-	-	-	3 500
Subtotal On farm dairy processing										1 750	118 500	120 250	118 500	118 500	118 500	596 000
2. Off farm dairy processing																
a. Coaching and mentoring																
Perdiem and transport for follow up and monitoring	month	-	80	80	80	80	80	400	50	-	4 000	4 000	4 000	4 000	4 000	20 000
b. Training of small and mid size processors																
Perdiem and transport of participants	day/paticipant	-	560	-	560	-	-	1 120	40	-	22 400	-	22 400	-	-	44 800
Perdiem and transport of trainers	days	-	56	-	56	-	-	112	50	-	2 800	-	2 800	-	-	5 600
Renting facility	LS	-	8	-	8	-	-	16	500	-	4 000	-	4 000	-	-	8 000
Subtotal Training of small and mid size processors										-	29 200	-	29 200	-	-	58 400
Subtotal Off farm dairy processing										-	33 200	4 000	33 200	4 000	4 000	78 400
Total Recurrent Costs										1 750	151 700	124 250	151 700	122 500	122 500	674 400
Total										456 350	810 440	665 190	548 900	549 700	285 700	3 316 280

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Table 3. C3: Project management and support
Detailed Costs

(US$)		Quantities							Base Cost						
	Unit	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Total	Unit Cost	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Total
I. Investment Costs																
A. Project Management Unit																
Office Refurbishing	Office	1	-	-	-	-	-	1	20,000	20 000	-	-	-	-	-	20 000
Office Furniture	person	1	-	-	-	-	-	1	15,000	15 000	-	-	-	-	-	15 000
Computers	No	5	5	-	-	-	-	10	900	4 500	4 500	-	-	-	-	9 000
Accounting softw are	LS	1	-	-	-	-	-	1	25,000	25 000	-	-	-	-	-	25 000
Other Office Equipment	Office	4	2	-	-	-	-	6	400	1 600	800	-	-	-	-	2 400
4WD Vehicles	No	2	2	-	-	-	-	4	24,000	48 000	48 000	-	-	-	-	96 000
Subtotal Project Management Unit										114 100	53 300	-	-	-	-	167 400
B. M&E and Gender related activities																
1. M&E																
Baseline Survey	survey	1	-	-	-	-	-	1	50,000	50 000	-	-	-	-	-	50 000
Review of Poverty, targeting and gender Strategy	study	1	-	-	-	-	-	1	40,000	40 000	-	-	-	-	-	40 000
Technical assistance	pers/month	1	-	-	-	-	-	1	15,000	15 000	-	-	-	-	-	15 000
Completion Survey	survey	-	-	-	-	-	1	1	50,000	-	-	-	-	-	50 000	50 000
Final evaluation	evaluation	-	-	-	-	-	1	1	95,000	-	-	-	-	-	95 000	95 000
Annual M&E activities	LS	1	1	1	1	1	1	6	15,000	15 000	15 000	15 000	15 000	15 000	15 000	90 000
Training /a	LS	1	1	1	1	1	-	5	9,000	9 000	9 000	9 000	9 000	9 000	-	45 000
Subtotal M&E										129 000	24 000	24 000	24 000	24 000	160 000	385 000
2. Poverty and Gender Targeting Exercise																
Workshop /b	w orkshop	1	-	-	-	-	-	1	5,000	5 000	-	-	-	-	-	5 000
Tablets (android)	LS	10	-	-	-	-	-	10	500	5 000	-	-	-	-	-	5 000
Field w ork and Data Analysis (Senior researchers)	person months	2	-	-	-	-	-	2	2,000	4 000	-	-	-	-	-	4 000
Field w ork and Data Analysis (junior researchers)	person months	4	-	-	-	-	-	4	500	2 000	-	-	-	-	-	2 000
Subtotal Poverty and Gender Targeting Exercise										16 000	-	-	-	-	-	16 000
Subtotal M&E and Gender related activities										145 000	24 000	24 000	24 000	24 000	160 000	401 000
C. Improving access to employment in agriculture and agro-processing /c	LS									150 000	150 000	50 000	50 000	50 000	50 000	500 000
Total Investment Costs										409 100	227 300	74 000	74 000	74 000	210 000	1 068 400
II. Recurrent Costs																
A. Project Coordination Unit Staff																
1. Project Director	year	1	1	1	1	1	1	6	48,000	48 000	48 000	48 000	48 000	48 000	48 000	288 000
2. Monitoring & Evaluation Officer	year	1	1	1	1	1	1	6	15,000	15 000	15 000	15 000	15 000	15 000	15 000	90 000
3. Procurement Officer	year	1	1	1	1	1	1	6	24,000	24 000	24 000	24 000	24 000	24 000	24 000	144 000
4. Financial Manager	year	1	1	1	1	1	1	6	18,000	18 000	18 000	18 000	18 000	18 000	18 000	108 000
5. Accountant	year	1	1	1	1	1	1	6	12,000	12 000	12 000	12 000	12 000	12 000	12 000	72 000
6. Administration Assistant	year	1	1	1	1	1	1	6	12,000	12 000	12 000	12 000	12 000	12 000	12 000	72 000
7. Drivers	year	2	2	2	2	2	2	12	7,200	14 400	14 400	14 400	14 400	14 400	14 400	86 400
8. Incentives for ARD staff	year	6	6	6	6	6	6	36	5,000	30 000	30 000	30 000	30 000	30 000	30 000	180 000
Subtotal Project Coordination Unit Staff										173 400	173 400	173 400	173 400	173 400	173 400	1 040 400
B. PMU Operating Expenses																
Vehicles	Year	4	4	4	4	4	4	24	4,000	16 000	16 000	16 000	16 000	16 000	16 000	96 000
Office O&M	Year	1	1	1	1	1	1	6	15,000	15 000	15 000	15 000	15 000	15 000	15 000	90 000
Field Allow ances	staff day	1 000	1 000	1 000	1 000	1 000	1 000	6 000	70	70 000	70 000	70 000	70 000	70 000	70 000	420 000
Subtotal PMU Operating Expenses										101 000	101 000	101 000	101 000	101 000	101 000	606 000
Total Recurrent Costs										274 400	274 400	274 400	274 400	274 400	274 400	1 646 400
Total										683 500	501 700	348 400	348 400	348 400	484 400	2 714 800

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E

D. Detailed Base Costs (LBP million)

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)																	
Table 1. C1: Enhancing competitiveness of smallholder dairy production:																	
Detailed Costs																	
(LBP '000)					Quantities								Base Cost				
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Unit Cost**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																
A. Extension																
1. logistical support																
vehicles for extension	Unit	5	-	-	-	-	-	5	36,000.0	180 000	-	-	-	-	-	180 000
vehicles for supervision (National level)	Unit	1	-	-	-	-	-	1	37,500.0	37 500	-	-	-	-	-	37 500
equipment for extension	LS	31	-	-	-	-	-	31	10,500.0	325 500	-	-	-	-	-	325 500
Subtotal logistical support										543 000	-	-	-	-	-	543 000
2. Preparation and production of training and learning materials																
development of extension and training material (incl. graphic design)	LS	-	1	-	-	-	-	1	25,500.0	-	25 500	-	-	-	-	25 500
production of extension and training material	Unit	5 000	-	-	-	-	-	5 000	7.5	37 500	-	-	-	-	-	37 500
Subtotal Preparation and production of training and learning materials										37 500	25 500	-	-	-	-	63 000
3. refresher training of AC staff on methodological and technical aspects	LS	1	1	1	-	-	-	3	45,000.0	45 000	45 000	45 000	-	-	-	135 000
4. subcontracting NGOs for additional extension service delivery	LS per province	-	7	7	7	7	7	35	28,500.0	-	199 500	199 500	199 500	199 500	199 500	997 500
Subtotal Extension										625 500	270 000	244 500	199 500	199 500	199 500	1 738 500
B. TVET																
1. Selection of TVET participants	5	-	1	1	1	1	1	5	7,500.0	-	7 500	7 500	7 500	7 500	7 500	37 500
2. Support to development of specialized TVET dairy curricula	LS	-	1	-	-	-	-	1	15,000.0	-	15 000	-	-	-	-	15 000
Subtotal TVET										-	22 500	7 500	7 500	7 500	7 500	52 500
C. Animal health																
1. Revamping the national surveillance system and animal health database																
International consultancy for system design	LS	1	-	-	-	-	-	1	30,000.0	30 000	-	-	-	-	-	30 000
National consultancy for implementation support	LS	-	1	1	1	1	1	5	13,500.0	-	13 500	13 500	13 500	13 500	13 500	67 500
re-vamping of softw are	LS	1	-	-	-	-	-	1	30,000.0	30 000	-	-	-	-	-	30 000
Server	server	1	-	-	-	-	-	1	18,000.0	18 000	-	-	-	-	-	18 000
Computer sets	computers	20	-	-	-	-	-	20	2,550.0	51 000	-	-	-	-	-	51 000
Vehicles for surveillance and vaccination	vehicle	10	-	-	-	-	-	10	36,000.0	360 000	-	-	-	-	-	360 000
data entry & maintainance of the system	perso-month	-	12	12	12	12	12	60	1,500.0	-	18 000	18 000	18 000	18 000	18 000	90 000
Ear tags	unit	100 000	25 000	25 000	25 000	25 000	25 000	225 000	1.1	105 000	26 250	26 250	26 250	26 250	26 250	236 250
Subtotal Revamping the national surveillance system and animal health database										594 000	57 750	57 750	57 750	57 750	57 750	882 750
2. Providing laboratory kits for surveillance																
post vaccination sero monitoring kits	LS	1	1	1	1	1	1	6	57,000.0	57 000	57 000	57 000	57 000	57 000	57 000	342 000
sero surveillance kits and sample collection equipement	LS	1	1	1	1	1	1	6	58,500.0	58 500	58 500	58 500	58 500	58 500	58 500	351 000
Subtotal Providing laboratory kits for surveillance										115 500	115 500	115 500	115 500	115 500	115 500	693 000
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases																
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	man day	2 700	2 700	2 700	2 700	2 700	2 700	16 200	60.0	162 000	162 000	162 000	162 000	162 000	162 000	972 000
Sanitary mandate for surveillance and vaccination- contracting veterinarians	man day	2 700	2 700	2 700	2 700	2 700	2 700	16 200	82.5	222 750	222 750	222 750	222 750	222 750	222 750	1 336 500
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases										384 750	384 750	384 750	384 750	384 750	384 750	2 308 500
Subtotal Animal health										1 094 250	558 000	558 000	558 000	558 000	558 000	3 884 250
Total Investment Costs										1 719 750	850 500	810 000	765 000	765 000	765 000	5 675 250
II. Recurrent Costs																
A. strengthening Agricultural Centers' specialized human resources																
Contracted livestock extension agents	pers-year	5	10	10	10	10	10	55	22,500.0	112 500	225 000	225 000	225 000	225 000	225 000	1 237 500
B. Improving the animal health status of the dairy herd and flock																
1. Salary drivers	pers-month	60	120	120	120	120	120	660	900.0	54 000	108 000	108 000	108 000	108 000	108 000	594 000
2. Running costs vehicles	vehicle month	60	120	120	120	120	120	660	450.0	27 000	54 000	54 000	54 000	54 000	54 000	297 000
Subtotal Improving the animal health status of the dairy herd and flock										81 000	162 000	162 000	162 000	162 000	162 000	891 000
Total Recurrent Costs										193 500	387 000	387 000	387 000	387 000	387 000	2 128 500
Total										1 913 250	1 237 500	1 197 000	1 152 000	1 152 000	1 152 000	7 803 750

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Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs
(LBP '000)

		Quantities								Base Cost						
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Unit Cost**	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																
A. Supporting aggregation and value addition																
1. On farm dairy processing																
a. Production of training material (incl. graphic design)	LS	1	-	-	-	-	-	1	14,250.0	14 250	-	-	-	-	-	14 250
b. Printing of training material	copies	1 400	-	-	-	-	-	1 400	15.0	21 000	-	-	-	-	-	21 000
c. Equipment for training and demonstration purposes /a	Unit	12	12	-	-	-	-	24	3,000.0	36 000	36 000	-	-	-	-	72 000
d. Thermometer	Ea	1 000	1 000	1 000	1 000	1 000	1 000	6 000	7.5	7 500	7 500	7 500	7 500	7 500	7 500	45 000
e. Milk cans /b	Units	1 500	1 500	-	-	-	-	3 000	150.0	225 000	225 000	-	-	-	-	450 000
f. Cheese press	Units	-	-	50	150	300	-	500	450.0	-	-	22 500	67 500	135 000	-	225 000
g. Dairy culture	Pouch	-	300	300	400	450	500	1 950	30.0	-	9 000	9 000	12 000	13 500	15 000	58 500
h. Training equipment kit	LS	7	-	-	-	-	-	7	900.0	6 300	-	-	-	-	-	6 300
i. Supplies for training	LS	-	14	14	14	14	14	70	300.0	-	4 200	4 200	4 200	4 200	4 200	21 000
j. Lactoscan /c	Ea	7	-	-	-	-	-	7	1,800.0	12 600	-	-	-	-	-	12 600
k. pH/EC meter /d	Ea	7	-	-	-	-	-	7	270.0	1 890	-	-	-	-	-	1 890
l. Training of trainers																
Honorarium	day	7	-	7	-	-	-	14	450.0	3 150	-	3 150	-	-	-	6 300
m. Training of Households processors																
Trainers fees (household producers)	days	-	98	98	98	98	98	490	450.0	-	44 100	44 100	44 100	44 100	44 100	220 500
n. Coaching and mentoring																
coach/trainer fees	days	-	150	150	150	150	150	750	450.0	-	67 500	67 500	67 500	67 500	67 500	337 500
o. Training of trainers																
Honorarium	day	7	-	7	-	-	-	14	450.0	3 150	-	3 150	-	-	-	6 300
Subtotal On farm dairy processing										330 840	393 300	161 100	202 800	271 800	138 300	1 498 140
2. Off farm dairy processing /e																
a. Preparation and production of training and learning materials																
Development of training material	LS	1	-	-	-	-	-	1	15,000.0	15 000	-	-	-	-	-	15 000
Printing of training material	copies	1 000	-	-	-	-	-	1 000	12.0	12 000	-	-	-	-	-	12 000
Supplies for training	LS	-	8	-	8	-	-	16	375.0	-	3 000	-	3 000	-	-	6 000
Subtotal Preparation and production of training and learning materials										27 000	3 000	-	3 000	-	-	33 000
b. Equipment for processing units																
Lactoscan	Ea	80	-	-	-	-	-	80	1,800.0	144 000	-	-	-	-	-	144 000
pH/EC meter /f	Ea	80	-	-	-	-	-	80	300.0	24 000	-	-	-	-	-	24 000
Thermometer	Ea	80	-	-	-	-	-	80	4.5	360	-	-	-	-	-	360
Dairy culture	Box	60	-	-	-	-	-	60	150.0	9 000	-	-	-	-	-	9 000
Subtotal Equipment for processing units										177 360	-	-	-	-	-	177 360
c. Coaching and mentoring																
coach/trainer fees	days	-	80	80	80	80	80	400	375.0	-	30 000	30 000	30 000	30 000	30 000	150 000
d. Training of small and mid size processors																
Trainers fees (processors)	days	-	56	-	56	-	-	112	375.0	-	21 000	-	21 000	-	-	42 000
Subtotal Off farm dairy processing										204 360	54 000	30 000	54 000	30 000	30 000	402 360
3. Supporting access to market																
a. Development of a quality label for Lebanese cottage dairy products	LS	-	-	1	1	1	-	3	67,500.0	-	-	67 500	67 500	67 500	-	202 500
b. Support product aggregation through improved operationality of cooperatives																
Training of cooperatives	training session	-	5	5	5	5	5	25	7,500.0	-	37 500	37 500	37 500	37 500	37 500	187 500
coaching of cooperatives for management and access to market	LS	-	1	1	1	1	1	5	7,500.0	-	7 500	7 500	7 500	7 500	7 500	37 500
Subtotal Support product aggregation through improved operationality of cooperatives										-	45 000	45 000	45 000	45 000	45 000	225 000
Subtotal Supporting access to market										-	45 000	112 500	112 500	112 500	45 000	427 500
4. Renew able energy applied to the dairy sectors /g	LS	-	-	1	1	1	-	3	150,000.0	-	-	150 000	150 000	150 000	-	450 000
Subtotal Supporting aggregation and value addition										535 200	492 300	453 600	519 300	564 300	213 300	2 778 000

B. Improvement of access to Rural Finance																	
1. Sustainable dairy loan product(s)																	
Facilitated Dairy Market and Inclusive Finance Workshop	LS	-	1	-	-	-	-	1	30,000.0	-	30 000	-	-	-	-	30 000
Technical Assistance	TA	-	2	2	-	-	-	4	112,500.0	-	225 000	225 000	-	-	-	450 000
Subtotal Sustainable dairy loan product(s)										-	255 000	225 000	-	-	-	480 000
2. Smallholder financial literacy																
Development of Financial Literacy module for extension w orkers	LS	-	1	-	-	-	-	1	22,500.0	-	22 500	-	-	-	-	22 500
Piloting of Financial Literacy module for extension w orkers	LS	-	1	-	-	-	-	1	19,500.0	-	19 500	-	-	-	-	19 500
Training of Trainers and extensionists on financial literacy	LS	-	-	1	-	-	-	1	15,000.0	-	-	15 000	-	-	-	15 000
Subtotal Smallholder financial literacy										-	42 000	15 000	-	-	-	57 000
3. Rural Finance Intelligence																
a. Assessment of inclusive rural finance																
Research	LS	1	-	-	-	-	-	1	52,500.0	52 500	-	-	-	-	-	52 500
Production	LS	-	1	-	-	-	-	1	10,500.0	-	10 500	-	-	-	-	10 500
Distribution	LS	-	1	-	-	-	-	1	15,000.0	-	15 000	-	-	-	-	15 000
Subtotal Assessment of inclusive rural finance										52 500	25 500	-	-	-	-	78 000
b. Assessment of smallholder dairy financing																
Research	LS	-	1	-	-	-	-	1	30,000.0	-	30 000	-	-	-	-	30 000
Production	LS	-	1	-	-	-	-	1	10,500.0	-	10 500	-	-	-	-	10 500
Distribution	LS	-	1	-	-	-	-	1	15,000.0	-	15 000	-	-	-	-	15 000
Subtotal Assessment of smallholder dairy financing										-	55 500	-	-	-	-	55 500
Subtotal Rural Finance Intelligence										52 500	81 000	-	-	-	-	133 500
4. Rural finance management /h	LS									23 700	41 310	41 310	-	-	-	106 320
Subtotal Improvement of access to Rural Finance										76 200	419 310	281 310	-	-	-	776 820
C. Supporting a dairy stakeholder platform for inclusive policy dialogue																
Initial national w orkshop	LS w orkshop	1	-	-	-	-	-	1	60,000.0	60 000	-	-	-	-	-	60 000
meetings of national platform	meeting	7	21	21	21	21	21	112	1,500.0	10 500	31 500	31 500	31 500	31 500	31 500	168 000
meetings of regional platform /i	LS study	-	1	1	1	1	-	4	45,000.0	-	45 000	45 000	45 000	45 000	-	180 000
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue										70 500	76 500	76 500	76 500	76 500	31 500	408 000
Total Investment Costs										681 900	988 110	811 410	595 800	640 800	244 800	3 962 820
II. Recurrent Costs																
A. Supporting aggregation and value addition																
1. On farm dairy processing																
a. Coaching and mentoring																
Perdiem and transport of coaches/trainers	month	-	150	150	150	150	150	750	75.0	-	11 250	11 250	11 250	11 250	11 250	56 250
b. Training of Households processors																
Perdiem and transport of participants	day/paticipant	-	2 000	2 000	2 000	2 000	2 000	10 000	75.0	-	150 000	150 000	150 000	150 000	150 000	750 000
Perdiem and transport of trainers	days	-	80	80	80	80	80	400	75.0	-	6 000	6 000	6 000	6 000	6 000	30 000
Renting facility	LS	-	14	14	14	14	14	70	750.0	-	10 500	10 500	10 500	10 500	10 500	52 500
Subtotal Training of Households processors										-	166 500	166 500	166 500	166 500	166 500	832 500
c. Training of trainers																
Perdiem	day	7	-	7	-	-	-	14	375.0	2 625	-	2 625	-	-	-	5 250
Subtotal On farm dairy processing										2 625	177 750	180 375	177 750	177 750	177 750	894 000
2. Off farm dairy processing																
a. Coaching and mentoring																
Perdiem and transport for follow up and monitoring	month	-	80	80	80	80	80	400	75.0	-	6 000	6 000	6 000	6 000	6 000	30 000
b. Training of small and mid size processors																
Perdiem and transport of participants	day/paticipant	-	560	-	560	-	-	1 120	60.0	-	33 600	-	33 600	-	-	67 200
Perdiem and transport of trainers	days	-	56	-	56	-	-	112	75.0	-	4 200	-	4 200	-	-	8 400
Renting facility	LS	-	8	-	8	-	-	16	750.0	-	6 000	-	6 000	-	-	12 000
Subtotal Training of small and mid size processors										-	43 800	-	43 800	-	-	87 600
Subtotal Off farm dairy processing										-	49 800	6 000	49 800	6 000	6 000	117 600
Total Recurrent Costs										2 625	227 550	186 375	227 550	183 750	183 750	1 011 600
Total										684 525	1 215 660	997 785	823 350	824 550	428 550	4 974 420

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 3. C3: Project management and support
Detailed Costs
(LBP '000)

		Quantities								Base Cost						
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**	**Unit Cost**	**Year 1**	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																
A. Project Management Unit																
Office Refurbishing	Office	1	-	-	-	-	-	1	30,000.0	30 000	-	-	-	-	-	30 000
Office Furniture	person	1	-	-	-	-	-	1	22,500.0	22 500	-	-	-	-	-	22 500
Computers	No	5	5	-	-	-	-	10	1,350.0	6 750	6 750	-	-	-	-	13 500
Accounting softw are	LS	1	-	-	-	-	-	1	37,500.0	37 500	-	-	-	-	-	37 500
Other Office Equipment	Office	4	2	-	-	-	-	6	600.0	2 400	1 200	-	-	-	-	3 600
4WD Vehicles	No	2	2	-	-	-	-	4	36,000.0	72 000	72 000	-	-	-	-	144 000
Subtotal Project Management Unit										171 150	79 950	-	-	-	-	251 100
B. M&E and Gender related activities																
1. M&E																
Baseline Survey	survey	1	-	-	-	-	-	1	75,000.0	75 000	-	-	-	-	-	75 000
Review of Poverty, targeting and gender Strategy	study	1	-	-	-	-	-	1	60,000.0	60 000	-	-	-	-	-	60 000
Technical assistance	pers/month	1	-	-	-	-	-	1	22,500.0	22 500	-	-	-	-	-	22 500
Completion Survey	survey	-	-	-	-	-	1	1	75,000.0	-	-	-	-	-	75 000	75 000
Final evaluation	evaluation	-	-	-	-	-	1	1	142,500.0	-	-	-	-	-	142 500	142 500
Annual M&E activities	LS	1	1	1	1	1	1	6	22,500.0	22 500	22 500	22 500	22 500	22 500	22 500	135 000
Training /a	LS	1	1	1	1	1	-	5	13,500.0	13 500	13 500	13 500	13 500	13 500	-	67 500
Subtotal M&E										193 500	36 000	36 000	36 000	36 000	240 000	577 500
2. Poverty and Gender Targeting Exercise																
Workshop /b	w orkshop	1	-	-	-	-	-	1	7,500.0	7 500	-	-	-	-	-	7 500
Tablets (android)	LS	10	-	-	-	-	-	10	750.0	7 500	-	-	-	-	-	7 500
Field w ork and Data Analysis (Senior researchers)	person months	2	-	-	-	-	-	2	3,000.0	6 000	-	-	-	-	-	6 000
Field w ork and Data Analysis (junior researchers)	person months	4	-	-	-	-	-	4	750.0	3 000	-	-	-	-	-	3 000
Subtotal Poverty and Gender Targeting Exercise										24 000	-	-	-	-	-	24 000
Subtotal M&E and Gender related activities										217 500	36 000	36 000	36 000	36 000	240 000	601 500
C. Improving access to employment in agriculture and agro-processing /c	LS									225 000	225 000	75 000	75 000	75 000	75 000	750 000
Total Investment Costs										613 650	340 950	111 000	111 000	111 000	315 000	1 602 600
II. Recurrent Costs																
A. Project Coordination Unit Staff																
1. Project Director	year	1	1	1	1	1	1	6	72,000.0	72 000	72 000	72 000	72 000	72 000	72 000	432 000
2. Monitoring & Evaluation Officer	year	1	1	1	1	1	1	6	22,500.0	22 500	22 500	22 500	22 500	22 500	22 500	135 000
3. Procurement Officer	year	1	1	1	1	1	1	6	36,000.0	36 000	36 000	36 000	36 000	36 000	36 000	216 000
4. Financial Manager	year	1	1	1	1	1	1	6	27,000.0	27 000	27 000	27 000	27 000	27 000	27 000	162 000
5. Accountant	year	1	1	1	1	1	1	6	18,000.0	18 000	18 000	18 000	18 000	18 000	18 000	108 000
6. Administration Assistant	year	1	1	1	1	1	1	6	18,000.0	18 000	18 000	18 000	18 000	18 000	18 000	108 000
7. Drivers	year	2	2	2	2	2	2	12	10,800.0	21 600	21 600	21 600	21 600	21 600	21 600	129 600
8. Incentives for ARD staff	year	6	6	6	6	6	6	36	7,500.0	45 000	45 000	45 000	45 000	45 000	45 000	270 000
Subtotal Project Coordination Unit Staff										260 100	260 100	260 100	260 100	260 100	260 100	1 560 600
B. PMU Operating Expenses																
Vehicles	Year	4	4	4	4	4	4	24	6,000.0	24 000	24 000	24 000	24 000	24 000	24 000	144 000
Office O&M	Year	1	1	1	1	1	1	6	22,500.0	22 500	22 500	22 500	22 500	22 500	22 500	135 000
Field Allow ances	staff day	1 000	1 000	1 000	1 000	1 000	1 000	6 000	105.0	105 000	105 000	105 000	105 000	105 000	105 000	630 000
Subtotal PMU Operating Expenses										151 500	151 500	151 500	151 500	151 500	151 500	909 000
Total Recurrent Costs										411 600	411 600	411 600	411 600	411 600	411 600	2 469 600
Total										1 025 250	752 550	522 600	522 600	522 600	726 600	4 072 200

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E.

E. Detailed Total Costs (USD million)

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Table 1. C1: Enhancing competitiveness of smallholder dairy production:							
Detailed Costs							
(US$)	**Totals Including Contingencies**						
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Extension							
1. logistical support							
vehicles for extension	128 849	-	-	-	-	-	128 849
vehicles for supervision (National level)	26 844	-	-	-	-	-	26 844
equipment for extension	233 971	-	-	-	-	-	233 971
Subtotal logistical support	389 664	-	-	-	-	-	389 664
2. Preparation and production of training and learning materials							
development of extension and training material (incl. graphic design)	-	18 656	-	-	-	-	18 656
production of extension and training material	26 955	-	-	-	-	-	26 955
Subtotal Preparation and production of training and learning materials	26 955	18 656	-	-	-	-	45 611
3. refresher training of AC staff on methodological and technical aspects	32 480	33 150	33 833	-	-	-	99 463
4. subcontracting NGOs for additional extension service delivery	-	140 444	143 534	146 692	149 919	153 217	733 807
Subtotal Extension	449 099	192 250	177 367	146 692	149 919	153 217	1 268 545
B. TVET							
1. Selection of TVET participants	-	5 525	5 639	5 755	5 874	5 995	28 788
2. Support to development of specialized TVET dairy curricula	-	11 050	-	-	-	-	11 050
Subtotal TVET	-	16 575	5 639	5 755	5 874	5 995	39 838
C. Animal health							
1. Revamping the national surveillance system and animal health database							
International consultancy for system design	20 452	-	-	-	-	-	20 452
National consultancy for implementation support	-	9 504	9 713	9 927	10 145	10 368	49 656
re-vamping of softw are	21 564	-	-	-	-	-	21 564
Server	12 938	-	-	-	-	-	12 938
Computer sets	36 659	-	-	-	-	-	36 659
Vehicles for surveillance and vaccination	257 698	-	-	-	-	-	257 698
data entry & maintainance of the system	-	12 672	12 950	13 235	13 527	13 824	66 208
Ear tags	75 475	19 205	19 547	19 896	20 251	20 613	174 987
Subtotal Revamping the national surveillance system and animal health database	424 787	41 380	42 211	43 058	43 923	44 805	640 163
2. Providing laboratory kits for surveillance							
post vaccination sero monitoring kits	40 972	41 702	42 445	43 203	43 974	44 759	257 055
sero surveillance kits and sample collection equipement	42 050	42 799	43 562	44 340	45 131	45 937	263 820
Subtotal Providing laboratory kits for surveillance	83 022	84 501	86 008	87 542	89 105	90 697	520 875
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases							
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	111 590	114 045	116 554	119 118	121 739	124 417	707 464
Sanitary mandate for surveillance and vaccination- contracting veterinarians	153 436	156 812	160 262	163 788	167 391	171 074	972 763
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases	265 027	270 857	276 816	282 906	289 130	295 491	1 680 226
Subtotal Animal health	772 835	396 739	405 034	413 506	422 158	430 993	2 841 265
Total Investment Costs	1 221 935	605 564	588 041	565 953	577 951	590 205	4 149 648
II. Recurrent Costs							
A. strengthening Agricultural Centers' specialized human resources							
Contracted livestock extension agents	77 493	158 396	161 881	165 442	169 082	172 802	905 095
B. Improving the animal health status of the dairy herd and flock							
1. Salary drivers	37 197	76 030	77 703	79 412	81 159	82 945	434 446
2. Running costs vehicles	19 488	39 780	40 600	41 437	42 292	43 165	226 762
Subtotal Improving the animal health status of the dairy herd and flock	56 685	115 810	118 303	120 849	123 452	126 110	661 208
Total Recurrent Costs	134 178	274 206	280 183	286 291	292 533	298 912	1 566 303
Total	1 356 112	879 769	868 224	852 245	870 484	889 117	5 715 951

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs

(US$)	Totals Including Contingencies						
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Supporting aggregation and value addition							
1. On farm dairy processing							
a. Production of training material (incl. graphic design)	10 243	-	-	-	-	-	10 243
b. Printing of training material	15 095	-	-	-	-	-	15 095
c. Equipment for training and demonstration purposes /a	25 877	26 338	-	-	-	-	52 215
d. Thermometer	5 391	5 487	5 585	5 685	5 786	5 889	33 823
e. Milk cans /b	161 731	164 613	-	-	-	-	326 344
f. Cheese press	-	-	16 755	51 161	104 149	-	172 065
g. Dairy culture	-	6 585	6 702	9 095	10 415	11 779	44 575
h. Training equipment kit	4 528	-	-	-	-	-	4 528
i. Supplies for training	-	3 073	3 128	3 183	3 240	3 298	15 922
j. Lactoscan /c	9 057	-	-	-	-	-	9 057
k. pH/EC meter /d	1 359	-	-	-	-	-	1 359
l. Training of trainers							
Honorarium	2 274	-	2 368	-	-	-	4 642
m. Training of Households processors							
Trainers fees (household producers)	-	32 487	33 156	33 840	34 539	35 252	169 274
n. Coaching and mentoring							
coach/trainer fees	-	47 519	48 564	49 633	50 725	51 840	248 281
o. Training of trainers							
Honorarium	2 274	-	2 368	-	-	-	4 642
Subtotal On farm dairy processing	237 828	286 101	118 626	152 597	208 853	108 058	1 112 064
2. Off farm dairy processing /e							
a. Preparation and production of training and learning materials							
Development of training material	10 782	-	-	-	-	-	10 782
Printing of training material	8 626	-	-	-	-	-	8 626
Supplies for training	-	2 195	-	2 274	-	-	4 469
Subtotal Preparation and production of training and learning materials	19 408	2 195	-	2 274	-	-	23 876
b. Equipment for processing units							
Lactoscan	103 508	-	-	-	-	-	103 508
pH/EC meter /f	17 251	-	-	-	-	-	17 251
Thermometer	259	-	-	-	-	-	259
Dairy culture	6 469	-	-	-	-	-	6 469
Subtotal Equipment for processing units	127 487	-	-	-	-	-	127 487
c. Coaching and mentoring							
coach/trainer fees	-	22 100	22 555	23 021	23 496	23 981	115 152
d. Training of small and mid size processors							
Trainers fees (processors)	-	15 470	-	16 114	-	-	31 584
Subtotal Off farm dairy processing	146 895	39 764	22 555	41 409	23 496	23 981	298 100
3. Supporting access to market							
a. Development of a quality label for Lebanese cottage dairy products	-	-	50 264	51 161	52 074	-	153 500
b. Support product aggregation through improved operationality of cooperatives							
Training of cooperatives	-	27 625	28 194	28 776	29 370	29 976	143 940
coaching of cooperatives for management and access to market	-	5 525	5 639	5 755	5 874	5 995	28 788
Subtotal Support product aggregation through improved operationality of cooperatives	-	33 150	33 833	34 531	35 244	35 971	172 728
Subtotal Supporting access to market	-	33 150	84 097	85 692	87 318	35 971	326 228
4. Renewable energy applied to the dairy sectors /g	-	-	113 316	115 809	118 357	-	347 483
Subtotal Supporting aggregation and value addition	384 723	359 015	338 596	395 508	438 024	168 010	2 083 875

B. Improvement of access to Rural Finance							
1. Sustainable dairy loan product(s)							
Facilitated Dairy Market and Inclusive Finance Workshop	-	22 175	-	-	-	-	22 175
Technical Assistance	-	158 396	161 881	-	-	-	320 277
Subtotal Sustainable dairy loan product(s)	-	180 571	161 881	-	-	-	342 452
2. Smallholder financial literacy							
Development of Financial Literacy module for extension w orkers	-	16 575	-	-	-	-	16 575
Piloting of Financial Literacy module for extension w orkers	-	14 365	-	-	-	-	14 365
Training of Trainers and extensionists on financial literacy	-	-	11 278	-	-	-	11 278
Subtotal Smallholder financial literacy	-	30 940	11 278	-	-	-	42 217
3. Rural Finance Intelligence							
a. Assessment of inclusive rural finance							
Research	37 972	-	-	-	-	-	37 972
Production	-	7 682	-	-	-	-	7 682
Distribution	-	10 974	-	-	-	-	10 974
Subtotal Assessment of inclusive rural finance	37 972	18 656	-	-	-	-	56 628
b. Assessment of smallholder dairy financing							
Research	-	22 175	-	-	-	-	22 175
Production	-	7 682	-	-	-	-	7 682
Distribution	-	10 974	-	-	-	-	10 974
Subtotal Assessment of smallholder dairy financing	-	40 832	-	-	-	-	40 832
Subtotal Rural Finance Intelligence	37 972	59 488	-	-	-	-	97 459
4. Rural finance management /h	16 325	29 082	29 721	-	-	-	75 128
Subtotal Improvement of access to Rural Finance	54 297	300 080	202 880	-	-	-	557 257
C. Supporting a dairy stakeholder platform for inclusive policy dialogue							
Initial national w orkshop	43 396	-	-	-	-	-	43 396
meetings of national platform	7 594	23 284	23 796	24 320	24 855	25 402	129 252
meetings of regional platform /i	-	33 263	33 995	34 743	35 507	-	137 508
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	50 990	56 547	57 791	59 063	60 362	25 402	310 156
Total Investment Costs	490 011	715 642	599 267	454 571	498 386	193 412	2 951 288
II. Recurrent Costs							
A. Supporting aggregation and value addition							
1. On farm dairy processing							
a. Coaching and mentoring							
Perdiem and transport of coaches/trainers	-	7 920	8 094	8 272	8 454	8 640	41 380
b. Training of Households processors							
Perdiem and transport of participants	-	105 597	107 920	110 295	112 721	115 201	551 735
Perdiem and transport of trainers	-	4 224	4 317	4 412	4 509	4 608	22 069
Renting facility	-	7 735	7 894	8 057	8 223	8 393	40 303
Subtotal Training of Households processors	-	117 556	120 132	122 764	125 454	128 202	614 107
c. Training of trainers							
Perdiem	1 808	-	1 889	-	-	-	3 697
Subtotal On farm dairy processing	1 808	125 476	130 114	131 036	133 908	136 842	659 184
2. Off farm dairy processing							
a. Coaching and mentoring							
Perdiem and transport for follow up and monitoring	-	4 224	4 317	4 412	4 509	4 608	22 069
b. Training of small and mid size processors							
Perdiem and transport of participants	-	23 654	-	24 706	-	-	48 360
Perdiem and transport of trainers	-	2 957	-	3 088	-	-	6 045
Renting facility	-	4 420	-	4 604	-	-	9 024
Subtotal Training of small and mid size processors	-	31 030	-	32 398	-	-	63 429
Subtotal Off farm dairy processing	-	35 254	4 317	36 810	4 509	4 608	85 498
Total Recurrent Costs	1 808	160 730	134 431	167 846	138 416	141 450	744 683
Total	491 819	876 373	733 698	622 417	636 803	334 862	3 695 971

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 3. C3: Project management and support
Detailed Costs

(US$)	Totals Including Contingencies						
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Project Management Unit							
Office Refurbishing	21 564	-	-	-	-	-	21 564
Office Furniture	16 173	-	-	-	-	-	16 173
Computers	4 852	4 938	-	-	-	-	9 790
Accounting softw are	26 955	-	-	-	-	-	26 955
Other Office Equipment	1 725	878	-	-	-	-	2 603
4WD Vehicles	51 540	52 313	-	-	-	-	103 852
Subtotal Project Management Unit	122 809	58 129	-	-	-	-	180 938
B. M&E and Gender related activities							
1. M&E							
Baseline Survey	54 245	-	-	-	-	-	54 245
Review of Poverty, targeting and gender Strategy	43 396	-	-	-	-	-	43 396
Technical assistance	15 499	-	-	-	-	-	15 499
Completion Survey	-	-	-	-	-	60 481	60 481
Final evaluation	-	-	-	-	-	114 913	114 913
Annual M&E activities	16 274	16 632	16 997	17 371	17 754	18 144	103 172
Training /a	9 744	9 945	10 150	10 359	10 573	-	50 771
Subtotal M&E	139 158	26 576	27 147	27 731	28 327	193 538	442 477
2. Poverty and Gender Targeting Exercise							
Workshop /b	5 413	-	-	-	-	-	5 413
Tablets (android)	5 391	-	-	-	-	-	5 391
Field w ork and Data Analysis (Senior researchers)	4 340	-	-	-	-	-	4 340
Field w ork and Data Analysis (junior researchers)	2 170	-	-	-	-	-	2 170
Subtotal Poverty and Gender Targeting Exercise	17 314	-	-	-	-	-	17 314
Subtotal M&E and Gender related activities	156 471	26 576	27 147	27 731	28 327	193 538	459 790
C. Improving access to employment in agriculture and agro-processing /c	162 401	165 748	56 389	57 552	58 739	59 952	560 780
Total Investment Costs	441 681	250 454	83 536	85 282	87 066	253 490	1 201 509
II. Recurrent Costs							
A. Project Coordination Unit Staff							
1. Project Director	49 596	50 687	51 802	52 941	54 106	55 297	314 428
2. Monitoring & Evaluation Officer	15 499	15 840	16 188	16 544	16 908	17 280	98 259
3. Procurement Officer	24 798	25 343	25 901	26 471	27 053	27 648	157 214
4. Financial Manager	18 598	19 008	19 426	19 853	20 290	20 736	117 911
5. Accountant	12 399	12 672	12 950	13 235	13 527	13 824	78 607
6. Administration Assistant	12 399	12 672	12 950	13 235	13 527	13 824	78 607
7. Drivers	14 879	15 206	15 541	15 882	16 232	16 589	94 328
8. Incentives for ARD staff	30 997	31 679	32 376	33 088	33 816	34 560	196 518
Subtotal Project Coordination Unit Staff	179 164	183 106	187 134	191 251	195 459	199 759	1 135 872
B. PMU Operating Expenses							
Vehicles	17 323	17 680	18 044	18 417	18 797	19 185	109 445
Office O&M	16 240	16 575	16 917	17 266	17 622	17 986	102 604
Field Allow ances	72 327	73 918	75 544	77 206	78 905	80 641	458 541
Subtotal PMU Operating Expenses	105 890	108 173	110 505	112 888	115 323	117 811	670 590
Total Recurrent Costs	285 054	291 279	297 639	304 139	310 782	317 569	1 806 462
Total	726 735	541 732	381 175	389 422	397 848	571 059	3 007 971

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E.

F. Detailed Total Costs (LBP million)

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Table 1. C1: Enhancing competitiveness of smallholder dairy production:							
Detailed Costs							
(LBP '000)	**Totals Including Contingencies**						
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Extension							
1. logistical support							
vehicles for extension	193 274	-	-	-	-	-	193 274
vehicles for supervision (National level)	40 265	-	-	-	-	-	40 265
equipment for extension	350 957	-	-	-	-	-	350 957
Subtotal logistical support	584 496	-	-	-	-	-	584 496
2. Preparation and production of training and learning materials							
development of extension and training material (incl. graphic design)	-	27 984	-	-	-	-	27 984
production of extension and training material	40 433	-	-	-	-	-	40 433
Subtotal Preparation and production of training and learning materials	40 433	27 984	-	-	-	-	68 417
3. refresher training of AC staff on methodological and technical aspects	48 720	49 724	50 750	-	-	-	149 194
4. subcontracting NGOs for additional extension service delivery	-	210 667	215 301	220 038	224 879	229 826	1 100 711
Subtotal Extension	673 649	288 375	266 051	220 038	224 879	229 826	1 902 818
B. TVET							
1. Selection of TVET participants	-	8 287	8 458	8 633	8 811	8 993	43 182
2. Support to development of specialized TVET dairy curricula	-	16 575	-	-	-	-	16 575
Subtotal TVET	-	24 862	8 458	8 633	8 811	8 993	59 757
C. Animal health							
1. Revamping the national surveillance system and animal health database							
International consultancy for system design	30 678	-	-	-	-	-	30 678
National consultancy for implementation support	-	14 256	14 569	14 890	15 217	15 552	74 484
re-vamping of softw are	32 346	-	-	-	-	-	32 346
Server	19 408	-	-	-	-	-	19 408
Computer sets	54 989	-	-	-	-	-	54 989
Vehicles for surveillance and vaccination	386 548	-	-	-	-	-	386 548
data entry & maintainance of the system	-	19 008	19 426	19 853	20 290	20 736	99 312
Ear tags	113 212	28 807	29 321	29 844	30 377	30 919	262 480
Subtotal Revamping the national surveillance system and animal health database	637 180	62 070	63 316	64 587	65 884	67 208	960 245
2. Providing laboratory kits for surveillance							
post vaccination sero monitoring kits	61 458	62 553	63 668	64 804	65 961	67 139	385 583
sero surveillance kits and sample collection equipement	63 075	64 199	65 344	66 509	67 697	68 906	395 730
Subtotal Providing laboratory kits for surveillance	124 533	126 752	129 012	131 313	133 658	136 045	781 312
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases							
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	167 385	171 068	174 831	178 677	182 608	186 626	1 061 196
Sanitary mandate for surveillance and vaccination- contracting veterinarians	230 155	235 218	240 393	245 681	251 086	256 610	1 459 144
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases	397 540	406 286	415 224	424 359	433 695	443 236	2 520 340
Subtotal Animal health	1 159 253	595 108	607 551	620 259	633 236	646 489	4 261 897
Total Investment Costs	1 832 902	908 345	882 061	848 930	866 926	885 308	6 224 472
II. Recurrent Costs							
A. strengthening Agricultural Centers' specialized human resources							
Contracted livestock extension agents	116 240	237 594	242 821	248 163	253 623	259 202	1 357 643
B. Improving the animal health status of the dairy herd and flock							
1. Salary drivers	55 795	114 045	116 554	119 118	121 739	124 417	651 669
2. Running costs vehicles	29 232	59 669	60 900	62 156	63 438	64 748	340 143
Subtotal Improving the animal health status of the dairy herd and flock	85 027	173 714	177 454	181 274	185 177	189 165	991 812
Total Recurrent Costs	201 267	411 308	420 275	429 437	438 800	448 367	2 349 455
Total	2 034 169	1 319 654	1 302 336	1 278 367	1 305 726	1 333 675	8 573 927

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)							
Table 2. C2: Improving small-scale value addition and access to market							
Detailed Costs							
(LBP '000)			**Totals Including Contingencies**				
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Supporting aggregation and value addition							
1. On farm dairy processing							
a. Production of training material (incl. graphic design)	15 364	-	-	-	-	-	15 364
b. Printing of training material	22 642	-	-	-	-	-	22 642
c. Equipment for training and demonstration purposes /a	38 815	39 507	-	-	-	-	78 323
d. Thermometer	8 087	8 231	8 377	8 527	8 679	8 834	50 735
e. Milk cans /b	242 597	246 919	-	-	-	-	489 516
f. Cheese press	-	-	25 132	76 742	156 223	-	258 097
g. Dairy culture	-	9 877	10 053	13 643	15 622	17 668	66 863
h. Training equipment kit	6 793	-	-	-	-	-	6 793
i. Supplies for training	-	4 609	4 691	4 775	4 860	4 947	23 883
j. Lactoscan /c	13 585	-	-	-	-	-	13 585
k. pH/EC meter /d	2 038	-	-	-	-	-	2 038
l. Training of trainers							
Honorarium	3 410	-	3 552	-	-	-	6 963
m. Training of Households processors							
Trainers fees (household producers)	-	48 730	49 735	50 761	51 808	52 877	253 911
n. Coaching and mentoring							
coach/trainer fees	-	71 278	72 846	74 449	76 087	77 761	372 421
o. Training of trainers							
Honorarium	3 410	-	3 552	-	-	-	6 963
Subtotal On farm dairy processing	356 742	429 151	177 940	228 896	313 280	162 088	1 668 096
2. Off farm dairy processing /e							
a. Preparation and production of training and learning materials							
Development of training material	16 173	-	-	-	-	-	16 173
Printing of training material	12 938	-	-	-	-	-	12 938
Supplies for training	-	3 292	-	3 411	-	-	6 703
Subtotal Preparation and production of training and learning materials	29 112	3 292	-	3 411	-	-	35 815
b. Equipment for processing units							
Lactoscan	155 262	-	-	-	-	-	155 262
pH/EC meter /f	25 877	-	-	-	-	-	25 877
Thermometer	388	-	-	-	-	-	388
Dairy culture	9 704	-	-	-	-	-	9 704
Subtotal Equipment for processing units	191 231	-	-	-	-	-	191 231
c. Coaching and mentoring							
coach/trainer fees	-	33 150	33 833	34 531	35 244	35 971	172 728
d. Training of small and mid size processors							
Trainers fees (processors)	-	23 205	-	24 172	-	-	47 376
Subtotal Off farm dairy processing	220 342	59 647	33 833	62 113	35 244	35 971	447 150
3. Supporting access to market							
a. Development of a quality label for Lebanese cottage dairy products	-	-	75 396	76 742	78 112	-	230 250
b. Support product aggregation through improved operationality of cooperatives							
Training of cooperatives	-	41 437	42 291	43 164	44 054	44 964	215 910
coaching of cooperatives for management and access to market	-	8 287	8 458	8 633	8 811	8 993	43 182
Subtotal Support product aggregation through improved operationality of cooperatives	-	49 724	50 750	51 797	52 865	53 957	259 093
Subtotal Supporting access to market	-	49 724	126 146	128 538	130 977	53 957	489 342
4. Renew able energy applied to the dairy sectors /g	-	-	169 975	173 714	177 536	-	521 225
Subtotal Supporting aggregation and value addition	577 085	538 522	507 894	593 262	657 036	252 015	3 125 813

B. Improvement of access to Rural Finance							
1. Sustainable dairy loan product(s)							
Facilitated Dairy Market and Inclusive Finance Workshop	-	33 263	-	-	-	-	33 263
Technical Assistance	-	237 594	242 821	-	-	-	480 415
Subtotal Sustainable dairy loan product(s)	-	270 857	242 821	-	-	-	513 678
2. Smallholder financial literacy							
Development of Financial Literacy module for extension w orkers	-	24 862	-	-	-	-	24 862
Piloting of Financial Literacy module for extension w orkers	-	21 547	-	-	-	-	21 547
Training of Trainers and extensionists on financial literacy	-	-	16 917	-	-	-	16 917
Subtotal Smallholder financial literacy	-	46 409	16 917	-	-	-	63 326
3. Rural Finance Intelligence							
a. Assessment of inclusive rural finance							
Research	56 957	-	-	-	-	-	56 957
Production	-	11 523	-	-	-	-	11 523
Distribution	-	16 461	-	-	-	-	16 461
Subtotal Assessment of inclusive rural finance	56 957	27 984	-	-	-	-	84 942
b. Assessment of smallholder dairy financing							
Research	-	33 263	-	-	-	-	33 263
Production	-	11 523	-	-	-	-	11 523
Distribution	-	16 461	-	-	-	-	16 461
Subtotal Assessment of smallholder dairy financing	-	61 247	-	-	-	-	61 247
Subtotal Rural Finance Intelligence	56 957	89 231	-	-	-	-	146 189
4. Rural finance management /h	24 488	43 622	44 582	-	-	-	112 692
Subtotal Improvement of access to Rural Finance	81 445	450 120	304 320	-	-	-	835 885
C. Supporting a dairy stakeholder platform for inclusive policy dialogue							
Initial national w orkshop	65 094	-	-	-	-	-	65 094
meetings of national platform	11 391	34 926	35 695	36 480	37 283	38 103	193 878
meetings of regional platform /i	-	49 895	50 992	52 114	53 261	-	206 262
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	76 486	84 821	86 687	88 594	90 543	38 103	465 234
Total Investment Costs	735 016	1 073 463	898 900	681 856	747 579	290 118	4 426 933
II. Recurrent Costs							
A. Supporting aggregation and value addition							
1. On farm dairy processing							
a. Coaching and mentoring							
Perdiem and transport of coaches/trainers	-	11 880	12 141	12 408	12 681	12 960	62 070
b. Training of Households processors							
Perdiem and transport of participants	-	158 396	161 881	165 442	169 082	172 802	827 602
Perdiem and transport of trainers	-	6 336	6 475	6 618	6 763	6 912	33 104
Renting facility	-	11 602	11 842	12 086	12 335	12 590	60 455
Subtotal Training of Households processors	-	176 334	180 198	184 146	188 180	192 304	921 161
c. Training of trainers							
Perdiem	2 712	-	2 833	-	-	-	5 545
Subtotal On farm dairy processing	2 712	188 214	195 172	196 554	200 861	205 264	988 777
2. Off farm dairy processing							
a. Coaching and mentoring							
Perdiem and transport for follow up and monitoring	-	6 336	6 475	6 618	6 763	6 912	33 104
b. Training of small and mid size processors							
Perdiem and transport of participants	-	35 481	-	37 059	-	-	72 540
Perdiem and transport of trainers	-	4 435	-	4 632	-	-	9 067
Renting facility	-	6 630	-	6 906	-	-	13 536
Subtotal Training of small and mid size processors	-	46 546	-	48 598	-	-	95 143
Subtotal Off farm dairy processing	-	52 882	6 475	55 215	6 763	6 912	128 247
Total Recurrent Costs	2 712	241 095	201 647	251 769	207 625	212 176	1 117 024
Total	737 728	1 314 559	1 100 547	933 625	955 204	502 294	5 543 957

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 3. C3: Project management and support
Detailed Costs
(LBP '000)

	Totals Including Contingencies						
	Year 1	**Year 2**	**Year 3**	**Year4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs							
A. Project Management Unit							
Office Refurbishing	32 346	-	-	-	-	-	32 346
Office Furniture	24 260	-	-	-	-	-	24 260
Computers	7 278	7 408	-	-	-	-	14 685
Accounting softw are	40 433	-	-	-	-	-	40 433
Other Office Equipment	2 588	1 317	-	-	-	-	3 905
4WD Vehicles	77 310	78 469	-	-	-	-	155 779
Subtotal Project Management Unit	184 214	87 194	-	-	-	-	271 407
B. M&E and Gender related activities							
1. M&E							
Baseline Survey	81 368	-	-	-	-	-	81 368
Review of Poverty, targeting and gender Strategy	65 094	-	-	-	-	-	65 094
Technical assistance	23 248	-	-	-	-	-	23 248
Completion Survey	-	-	-	-	-	90 721	90 721
Final evaluation	-	-	-	-	-	172 370	172 370
Annual M&E activities	24 410	24 947	25 496	26 057	26 630	27 216	154 758
Training /a	14 616	14 917	15 225	15 539	15 860	-	76 157
Subtotal M&E	208 736	39 865	40 721	41 596	42 490	290 307	663 715
2. Poverty and Gender Targeting Exercise							
Workshop /b	8 120	-	-	-	-	-	8 120
Tablets (android)	8 087	-	-	-	-	-	8 087
Field w ork and Data Analysis (Senior researchers)	6 509	-	-	-	-	-	6 509
Field w ork and Data Analysis (junior researchers)	3 255	-	-	-	-	-	3 255
Subtotal Poverty and Gender Targeting Exercise	25 971	-	-	-	-	-	25 971
Subtotal M&E and Gender related activities	234 707	39 865	40 721	41 596	42 490	290 307	689 686
C. Improving access to employment in agriculture and agro-processing /c	243 601	248 622	84 583	86 328	88 109	89 928	841 170
Total Investment Costs	662 522	375 680	125 304	127 924	130 599	380 234	1 802 263
II. Recurrent Costs							
A. Project Coordination Unit Staff							
1. Project Director	74 393	76 030	77 703	79 412	81 159	82 945	471 642
2. Monitoring & Evaluation Officer	23 248	23 759	24 282	24 816	25 362	25 920	147 388
3. Procurement Officer	37 197	38 015	38 851	39 706	40 580	41 472	235 821
4. Financial Manager	27 898	28 511	29 139	29 780	30 435	31 104	176 866
5. Accountant	18 598	19 008	19 426	19 853	20 290	20 736	117 911
6. Administration Assistant	18 598	19 008	19 426	19 853	20 290	20 736	117 911
7. Drivers	22 318	22 809	23 311	23 824	24 348	24 883	141 493
8. Incentives for ARD staff	46 496	47 519	48 564	49 633	50 725	51 840	294 777
Subtotal Project Coordination Unit Staff	268 746	274 659	280 701	286 877	293 188	299 638	1 703 808
B. PMU Operating Expenses							
Vehicles	25 984	26 520	27 067	27 625	28 195	28 777	164 167
Office O&M	24 360	24 862	25 375	25 898	26 433	26 978	153 906
Field Allow ances	108 490	110 877	113 316	115 809	118 357	120 961	687 812
Subtotal PMU Operating Expenses	158 835	162 259	165 758	169 333	172 985	176 716	1 005 885
Total Recurrent Costs	427 581	436 918	446 459	456 209	466 173	476 354	2 709 694
Total	1 090 103	812 598	571 763	584 133	596 771	856 588	4 511 957

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E

G. Project Financing (USD million)

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)																					
Table 1. C1: Enhancing competitiveness of smallholder dairy production:																					
Detailed Costs										**Expenditures by Financiers**											
(US$)			**IFAD LOAN**							**The Government**								**FARMS**			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																					
A. Extension																					
1. logistical support																					
vehicles for extension	83 752	-	-	-	-	-	83 752	45 097	-	-	-	-	-	45 097	-	-	-	-	-	-	-
vehicles for supervision (National level)	17 448	-	-	-	-	-	17 448	9 395	-	-	-	-	-	9 395	-	-	-	-	-	-	-
equipment for extension	233 971	-	-	-	-	-	233 971	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal logistical support	335 171	-	-	-	-	-	335 171	54 492	-	-	-	-	-	54 492	-	-	-	-	-	-	-
2. Preparation and production of training and learning materials																					
development of extension and training material (incl. graphic design)	-	18 656	-	-	-	-	18 656	-	-	-	-	-	-	-	-	-	-	-	-	-	-
production of extension and training material	26 955	-	-	-	-	-	26 955	0	-	-	-	-	-	0	-	-	-	-	-	-	-
Subtotal Preparation and production of training and learning materials	26 955	18 656	-	-	-	-	45 611	0	-	-	-	-	-	0	-	-	-	-	-	-	-
3. refresher training of AC staff on methodological and technical aspects	32 480	33 150	33 833	-	-	-	99 463	-	-	0	-	-	-	0	-	-	-	-	-	-	-
4. subcontracting NGOs for additional extension service delivery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140 444	143 534	146 692	149 919	153 217	733 807
Subtotal Extension	394 607	51 806	33 833	-	-	-	480 246	54 492	-	0	-	-	-	54 492	-	140 444	143 534	146 692	149 919	153 217	733 807
B. TVET																					
1. Selection of TVET participants	-	-	-	-	-	-	-	-	0	-	-	-	-	0	-	5 525	5 639	5 755	5 874	5 995	28 788
2. Support to development of specialized TVET dairy curricula	-	-	-	-	-	-	-	-	0	-	-	-	-	0	-	11 050	-	-	-	-	11 050
Subtotal TVET	-	-	-	-	-	-	-	-	0	-	-	-	-	0	-	16 575	5 639	5 755	5 874	5 995	39 838
C. Animal health																					
1. Revamping the national surveillance system and animal health database																					
International consultancy for system design	20 452	-	-	-	-	-	20 452	-	-	-	-	-	-	-	-	-	-	-	-	-	-
National consultancy for implementation support	-	9 504	9 713	9 927	10 145	10 368	49 656	-	-	-	-	-	-	-	-	-	-	-	-	-	-
re-vamping of softw are	21 564	-	-	-	-	-	21 564	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Server	12 938	-	-	-	-	-	12 938	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computer sets	36 659	-	-	-	-	-	36 659	0	-	-	-	-	-	0	-	-	-	-	-	-	-
Vehicles for surveillance and vaccination	167 504	-	-	-	-	-	167 504	90 194	-	-	-	-	-	90 194	-	-	-	-	-	-	-
data entry & maintainance of the system	-	12 672	12 950	13 235	13 527	13 824	66 208	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ear tags	-	-	-	-	-	-	-	0	0	-0	-	0	-	0	75 475	19 205	19 547	19 896	20 251	20 613	174 987
Subtotal Revamping the national surveillance system and animal health database	259 118	22 175	22 663	23 162	23 671	24 192	374 982	90 194	0	-0	-	0	-	90 194	75 475	19 205	19 547	19 896	20 251	20 613	174 987
2. Providing laboratory kits for surveillance																					
post vaccination sero monitoring kits	-	-	-	-	-	-	-	-	-	0	-0	-	-	-	40 972	41 702	42 445	43 203	43 974	44 759	257 055
sero surveillance kits and sample collection equipement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42 050	42 799	43 562	44 340	45 131	45 937	263 820
Subtotal Providing laboratory kits for surveillance	-	-	-	-	-	-	-	-	-	0	-0	-	-	-	83 022	84 501	86 008	87 542	89 105	90 697	520 875
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases																					
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111 590	114 045	116 554	119 118	121 739	124 417	707 464
Sanitary mandate for surveillance and vaccination- contracting veterinarians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	153 436	156 812	160 262	163 788	167 391	171 074	972 763
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	265 027	270 857	276 816	282 906	289 130	295 491	1 680 226
Subtotal Animal health	259 118	22 175	22 663	23 162	23 671	24 192	374 982	90 194	0	0	-0	0	-	90 194	423 523	374 563	382 371	390 344	398 486	406 800	2 376 088
Total Investment Costs	653 725	73 981	56 496	23 162	23 671	24 192	855 228	144 687	0	0	-0	0	-	144 687	423 523	531 582	531 544	542 791	554 279	566 013	3 149 733
II. Recurrent Costs																					
A. strengthening Agricultural Centers' specialized human resources																					
Contracted livestock extension agents	77 493	158 396	161 881	165 442	169 082	172 802	905 095	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Improving the animal health status of the dairy herd and flock																					
1. Salary drivers	-	-	-	-	-	-	-	37 197	76 030	77 703	79 412	81 159	82 945	434 446	-	-	-	-	-	-	-
2. Running costs vehicles	-	-	-	-	-	-	-	19 488	39 780	40 600	41 437	42 292	43 165	226 762	-	-	-	-	-	-	-
Subtotal Improving the animal health status of the dairy herd and flock	-	-	-	-	-	-	-	56 685	115 810	118 303	120 849	123 452	126 110	661 208	-	-	-	-	-	-	-
Total Recurrent Costs	77 493	158 396	161 881	165 442	169 082	172 802	905 095	56 685	115 810	118 303	120 849	123 452	126 110	661 208	-	-	-	-	-	-	-
Total	731 218	232 377	218 377	188 604	192 753	196 994	1 760 323	201 372	115 810	118 303	120 849	123 452	126 110	805 895	423 523	531 582	531 544	542 791	554 279	566 013	3 149 733

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market

Detailed Costs																Expenditures by Financiers						
(US$)				IFAD LOAN							IFAD GRANT					The Government						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
I. Investment Costs																						
A. Supporting aggregation and value addition																						
1. On farm dairy processing																						
a. Production of training material (incl. graphic design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
b. Printing of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
c. Equipment for training and demonstration purposes /a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	0
d. Thermometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	0	-0	0	-	-
e. Milk cans /b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	0
f. Cheese press	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	0	-	0
g. Dairy culture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-0	0	-	0
h. Training equipment kit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
i. Supplies for training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	0	0	0	-0	0
j. Lactoscan /c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
k. pH/EC meter /d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
l. Training of trainers																						
Honorarium	2 274	-	2 368	-	-	-	4 642	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m. Training of Households processors																						
Trainers fees (household producers)	-	32 487	33 156	33 840	34 539	35 252	169 274	-	-	-	-	-	-	-	-	-	-	-	-	0	0
n. Coaching and mentoring																						
coach/trainer fees	-	47 519	48 564	49 633	50 725	51 840	248 281	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o. Training of trainers																						
Honorarium	2 274	-	2 368	-	-	-	4 642	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	4 547	80 005	86 457	83 473	85 263	87 092	426 838	-	-	-	-	-	-	-	0	0	0	-0	0	0	0
2. Off farm dairy processing /e																						
a. Preparation and production of training and learning materials																						
Development of training material	10 782	-	-	-	-	-	10 782	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Printing of training material	8 626	-	-	-	-	-	8 626	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Supplies for training	-	2 195	-	2 274	-	-	4 469	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Preparation and production of training and learning materials	19 408	2 195	-	2 274	-	-	23 876	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Equipment for processing units																						
Lactoscan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH/EC meter /f	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
Thermometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
Dairy culture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Equipment for processing units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
c. Coaching and mentoring																						
coach/trainer fees	-	22 100	22 555	23 021	23 496	23 981	115 152	-	-	-	-	-	-	-	-	0	-	-	-	-	0
d. Training of small and mid size processors																						
Trainers fees (processors)	-	15 470	-	16 114	-	-	31 584	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	19 408	39 764	22 555	41 409	23 496	23 981	170 613	-	-	-	-	-	-	-	-0	0	-	-	-	-	0
3. Supporting access to market																						
a. Development of a quality label for Lebanese cottage dairy products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	0	-	-
b. Support product aggregation through improved operationality of cooperatives																						
Training of cooperatives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
coaching of cooperatives for management and access to market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	0
Subtotal Support product aggregation through improved operationality of cooperatives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	-	-	0
Subtotal Supporting access to market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	-	0
4. Renew able energy applied to the dairy sectors /g	-	-	113 316	115 809	118 357	-	347 483	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting aggregation and value addition	23 955	119 770	222 329	240 691	227 116	111 073	944 934	-	-	-	-	-	-	-	-0	0	0	-0	0	0	0

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs

(US$)	FARMS							Beneficiaries						
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**
I. Investment Costs														
A. Supporting aggregation and value addition														
1. On farm dairy processing														
a. Production of training material (incl. graphic design)	8 194	-	-	-	-	-	8 194	2 049	-	-	-	-	-	2 049
b. Printing of training material	12 076	-	-	-	-	-	12 076	3 019	-	-	-	-	-	3 019
c. Equipment for training and demonstration purposes /a	25 877	26 338	-	-	-	-	52 215	-	-	-	-	-	-	-
d. Thermometer	4 313	4 390	4 468	4 548	4 629	4 712	27 058	1 078	1 097	1 117	1 137	1 157	1 178	6 765
e. Milk cans /b	129 385	131 690	-	-	-	-	261 075	32 346	32 923	-	-	-	-	65 269
f. Cheese press	-	-	13 404	40 929	83 319	-	137 652	-	-	3 351	10 232	20 830	-	34 413
g. Dairy culture	-	5 268	5 362	7 276	8 332	9 423	35 660	-	1 317	1 340	1 819	2 083	2 356	8 915
h. Training equipment kit	4 528	-	-	-	-	-	4 528	-	-	-	-	-	-	-
i. Supplies for training	-	2 458	2 502	2 547	2 592	2 638	12 738	-	615	626	637	648	660	3 184
j. Lactoscan /c	7 246	-	-	-	-	-	7 246	1 811	-	-	-	-	-	1 811
k. pH/EC meter /d	1 087	-	-	-	-	-	1 087	272	-	-	-	-	-	272
l. Training of trainers														
Honorarium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m. Training of Households processors														
Trainers fees (household producers)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n. Coaching and mentoring														
coach/trainer fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o. Training of trainers														
Honorarium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	192 706	170 144	25 735	55 299	98 872	16 773	559 529	40 575	35 951	6 434	13 825	24 718	4 193	125 696
2. Off farm dairy processing /e														
a. Preparation and production of training and learning materials														
Development of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Printing of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Supplies for training	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Preparation and production of training and learning materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Equipment for processing units														
Lactoscan	82 806	-	-	-	-	-	82 806	20 702	-	-	-	-	-	20 702
pH/EC meter /f	13 801	-	-	-	-	-	13 801	3 450	-	-	-	-	-	3 450
Thermometer	207	-	-	-	-	-	207	52	-	-	-	-	-	52
Dairy culture	5 175	-	-	-	-	-	5 175	1 294	-	-	-	-	-	1 294
Subtotal Equipment for processing units	101 990	-	-	-	-	-	101 990	25 497	-	-	-	-	-	25 497
c. Coaching and mentoring														
coach/trainer fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d. Training of small and mid size processors														
Trainers fees (processors)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	101 990	-	-	-	-	-	101 990	25 497	-	-	-	-	-	25 497
3. Supporting access to market														
a. Development of a quality label for Lebanese cottage dairy products	-	-	50 264	51 161	52 074	-	153 500	-	-	-	-	-	-	-
b. Support product aggregation through improved operationality of cooperatives														
Training of cooperatives	-	27 625	28 194	28 776	29 370	29 976	143 940	-	-	-	-	-	-	-
coaching of cooperatives for management and access to market	-	5 525	5 639	5 755	5 874	5 995	28 788	-	-	-	-	-	-	-
Subtotal Support product aggregation through improved operationality of cooperatives	-	33 150	33 833	34 531	35 244	35 971	172 728	-	-	-	-	-	-	-
Subtotal Supporting access to market	-	33 150	84 097	85 692	87 318	35 971	326 228	-	-	-	-	-	-	-
4. Renew able energy applied to the dairy sectors /g	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting aggregation and value addition	294 696	203 293	109 833	140 991	186 190	52 744	987 747	66 073	35 951	6 434	13 825	24 718	4 193	151 194

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market

Detailed Costs	IFAD LOAN							IFAD GRANT							Expenditures by Financiers: The Government						
(US$)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
B. Improvement of access to Rural Finance																					
1. Sustainable dairy loan product(s)																					
Facilitated Dairy Market and Inclusive Finance Workshop	-	22 175	-	-	-	-	22 175	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Sustainable dairy loan product(s)	-	22 175	-	-	-	-	22 175	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Smallholder financial literacy																					
Development of Financial Literacy module for extension w orkers	-	16 575	-	-	-	-	16 575	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piloting of Financial Literacy module for extension w orkers	-	14 365	-	-	-	-	14 365	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Training of Trainers and extensionists on financial literacy	-	-	11 278	-	-	-	11 278	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Smallholder financial literacy	-	30 940	11 278	-	-	-	42 217	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Rural Finance Intelligence																					
a. Assessment of inclusive rural finance																					
Research	37 972	-	-	-	-	-	37 972	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	7 682	-	-	-	-	7 682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	10 974	-	-	-	-	10 974	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of inclusive rural finance	37 972	18 656	-	-	-	-	56 628	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Assessment of smallholder dairy financing																					
Research	-	22 175	-	-	-	-	22 175	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	7 682	-	-	-	-	7 682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	10 974	-	-	-	-	10 974	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of smallholder dairy financing	-	40 832	-	-	-	-	40 832	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Rural Finance Intelligence	37 972	59 488	-	-	-	-	97 459	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Rural finance management /h	16 325	29 082	29 721	-	-	-	75 128	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Improvement of access to Rural Finance	54 297	141 684	40 999	-	-	-	236 980	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. Supporting a dairy stakeholder platform for inclusive policy dialogue																					
Initial national w orkshop	-	-	-	-	-	-	-	43 396	-	-	-	-	-	43 396	-	-	-	-	-	-	-
meetings of national platform	-	-	-	-	-	-	-	7 594	23 284	23 796	24 320	24 855	25 402	129 252	-	-	-	-	-	-	-
meetings of regional platform /i	-	-	-	-	-	-	-	-	33 263	33 995	34 743	35 507	-	137 508	-	-	-	-	-	-	-
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	-	-	-	-	-	-	50 990	56 547	57 791	59 063	60 362	25 402	310 156	-	-	-	-	-	-	-
Total Investment Costs	78 252	261 454	263 328	240 691	227 116	111 073	1 181 915	50 990	56 547	57 791	59 063	60 362	25 402	310 156	-0	0	0	-0	0	0	0
II. Recurrent Costs																					
A. Supporting aggregation and value addition																					
1. On farm dairy processing																					
a. Coaching and mentoring																					
Perdiem and transport of coaches/trainers	-	7 920	8 094	8 272	8 454	8 640	41 380	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of Households processors																					
Perdiem and transport of participants	-	105 597	107 920	110 295	112 721	115 201	551 735	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	4 224	4 317	4 412	4 509	4 608	22 069	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	7 735	7 894	8 057	8 223	8 393	40 303	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Subtotal Training of Households processors	-	117 556	120 132	122 764	125 454	128 202	614 107	-	-	-	-	-	-	-	-	-	-	-	0	0	0
c. Training of trainers																					
Perdiem	1 808	-	1 889	-	-	-	3 697	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	1 808	125 476	130 114	131 036	133 908	136 842	659 184	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2. Off farm dairy processing																					
a. Coaching and mentoring																					
Perdiem and transport for follow up and monitoring	-	4 224	4 317	4 412	4 509	4 608	22 069	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of small and mid size processors																					
Perdiem and transport of participants	-	23 654	-	24 706	-	-	48 360	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	2 957	-	3 088	-	-	6 045	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	4 420	-	4 604	-	-	9 024	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Subtotal Training of small and mid size processors	-	31 030	-	32 398	-	-	63 429	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Subtotal Off farm dairy processing	-	35 254	4 317	36 810	4 509	4 608	85 498	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Total Recurrent Costs	1 808	160 730	134 431	167 846	138 416	141 450	744 683	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Total	80 060	422 184	397 759	408 537	365 533	252 523	1 926 597	50 990	56 547	57 791	59 063	60 362	25 402	310 156	-0	0	0	-0	0	0	0

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs

(US$)	FARMS							Beneficiaries						
	2000	2001	2002	2003	2004	2005	Total	2000	2001	2002	2003	2004	2005	Total
B. Improvement of access to Rural Finance														
1. Sustainable dairy loan product(s)														
Facilitated Dairy Market and Inclusive Finance Workshop	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Assistance	-	158 396	161 881	-	-	-	320 277	-	-	-	-	-	-	-
Subtotal Sustainable dairy loan product(s)	-	158 396	161 881	-	-	-	320 277	-	-	-	-	-	-	-
2. Smallholder financial literacy														
Development of Financial Literacy module for extension workers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piloting of Financial Literacy module for extension workers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Training of Trainers and extensionists on financial literacy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Smallholder financial literacy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Rural Finance Intelligence														
a. Assessment of inclusive rural finance														
Research	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of inclusive rural finance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Assessment of smallholder dairy financing														
Research	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of smallholder dairy financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Rural Finance Intelligence	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Rural finance management /h	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Improvement of access to Rural Finance	-	158 396	161 881	-	-	-	320 277	-	-	-	-	-	-	-
C. Supporting a dairy stakeholder platform for inclusive policy dialogue														
Initial national workshop	-	-	-	-	-	-	-	-	-	-	-	-	-	-
meetings of national platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-
meetings of regional platform /i	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Investment Costs	294 696	361 689	271 713	140 991	186 190	52 744	1 308 024	66 073	35 951	6 434	13 825	24 718	4 193	151 194
II. Recurrent Costs														
A. Supporting aggregation and value addition														
1. On farm dairy processing														
a. Coaching and mentoring														
Perdiem and transport of coaches/trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of Households processors														
Perdiem and transport of participants	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of Households processors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c. Training of trainers														
Perdiem	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Off farm dairy processing														
a. Coaching and mentoring														
Perdiem and transport for follow up and monitoring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of small and mid size processors														
Perdiem and transport of participants	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of small and mid size processors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recurrent Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	294 696	361 689	271 713	140 991	186 190	52 744	1 308 024	66 073	35 951	6 434	13 825	24 718	4 193	151 194

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final workshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Table 3. C3: Project management and support

Detailed Costs	**Expenditures by Financiers**																			
(US$)	**IFAD LOAN**							**IFAD GRANT**							**The Government**						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																					
A. Project Management Unit																					
Office Refurbishing	21 564	-	-	-	-	-	21 564	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Furniture	16 173	-	-	-	-	-	16 173	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computers	4 852	4 938	-	-	-	-	9 790	-	-	-	-	-	-	-	0	-	-	-	-	-	0
Accounting softw are	26 955	-	-	-	-	-	26 955	-	-	-	-	-	-	-	0	-	-	-	-	-	0
Other Office Equipment	1 725	878	-	-	-	-	2 603	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4WD Vehicles	41 232	41 850	-	-	-	-	83 082	-	-	-	-	-	-	-	10 308	10 463	-	-	-	-	20 770
Subtotal Project Management Unit	112 501	47 667	-	-	-	-	160 168	-	-	-	-	-	-	-	10 308	10 463	-	-	-	-	20 770
B. M&E and Gender related activities																					
1. M&E																					
Baseline Survey	-	-	-	-	-	-	-	54 245	-	-	-	-	-	54 245	-	-	-	-	-	-	-
Review of Poverty, targeting and gender Strategy	-	-	-	-	-	-	-	43 396	-	-	-	-	-	43 396	-	-	-	-	-	-	-
Technical assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Completion Survey	-	-	-	-	-	-	-	-	-	-	-	-	60 481	60 481	-	-	-	-	-	-	-
Final evaluation	-	-	-	-	-	114 913	114 913	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual M&E activities	-	-	-	-	-	-	-	16 274	16 632	16 997	17 371	17 754	18 144	103 172	-	-	-	-	-	-	-
Training /a	9 744	9 945	10 150	10 359	10 573	-	50 771	-	-	-	-	-	-	-	-	-0	-	-	0	-	0
Subtotal M&E	9 744	9 945	10 150	10 359	10 573	114 913	165 684	113 915	16 632	16 997	17 371	17 754	78 625	261 294	-	-0	-	-	0	-	0
2. Poverty and Gender Targeting Exercise																					
Workshop /b	5 413	-	-	-	-	-	5 413	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tablets (android)	5 391	-	-	-	-	-	5 391	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field w ork and Data Analysis (Senior researchers)	4 340	-	-	-	-	-	4 340	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field w ork and Data Analysis (junior researchers)	2 170	-	-	-	-	-	2 170	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Poverty and Gender Targeting Exercise	17 314	-	-	-	-	-	17 314	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal M&E and Gender related activities	27 058	9 945	10 150	10 359	10 573	114 913	182 998	113 915	16 632	16 997	17 371	17 754	78 625	261 294	-	-0	-	-	0	-	0
C. Improving access to employment in agriculture and agro-processing /c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	-	0	-	-	0
Total Investment Costs	139 559	57 611	10 150	10 359	10 573	114 913	343 166	113 915	16 632	16 997	17 371	17 754	78 625	261 294	10 308	10 463	-	0	0	-	20 770
II. Recurrent Costs																					
A. Project Coordination Unit Staff																					
1. Project Director	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49 596	50 687	51 802	52 941	54 106	55 297	314 428
2. Monitoring & Evaluation Officer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15 499	15 840	16 188	16 544	16 908	17 280	98 259
3. Procurement Officer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24 798	25 343	25 901	26 471	27 053	27 648	157 214
4. Financial Manager	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18 598	19 008	19 426	19 853	20 290	20 736	117 911
5. Accountant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12 399	12 672	12 950	13 235	13 527	13 824	78 607
6. Administration Assistant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12 399	12 672	12 950	13 235	13 527	13 824	78 607
7. Drivers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14 879	15 206	15 541	15 882	16 232	16 589	94 328
8. Incentives for ARD staff	30 997	31 679	32 376	33 088	33 816	34 560	196 518	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Project Coordination Unit Staff	30 997	31 679	32 376	33 088	33 816	34 560	196 518	-	-	-	-	-	-	-	148 167	151 427	154 758	158 163	161 642	165 198	939 355
B. PMU Operating Expenses																					
Vehicles	17 323	17 680	18 044	18 417	18 797	19 185	109 445	-	-	-	-	-	-	-	-	-	0	0	0	-	0
Office O&M	16 240	16 575	16 917	17 266	17 622	17 986	102 604	-	-	-	-	-	-	-	-	-	0	-	-	-	0
Field Allow ances	72 327	73 918	75 544	77 206	78 905	80 641	458 541	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal PMU Operating Expenses	105 890	108 173	110 505	112 888	115 323	117 811	670 590	-	-	-	-	-	-	-	-	-	0	0	0	-	0
Total Recurrent Costs	136 887	139 852	142 881	145 977	149 140	152 371	867 108	-	-	-	-	-	-	-	148 167	151 427	154 758	158 163	161 642	165 198	939 355
Total	276 446	197 463	153 031	156 336	159 713	267 284	1 210 274	113 915	16 632	16 997	17 371	17 754	78 625	261 294	158 475	161 889	154 758	158 163	161 642	165 198	960 125

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E

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Harmonized Actions for Livestock Enhanced Production and Processing (HALE							
Table 3. C3: Project management and support							
Detailed Costs							
(US$)				FARMS			
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**
I. Investment Costs							
A. Project Management Unit							
Office Refurbishing	-	-	-	-	-	-	-
Office Furniture	-	-	-	-	-	-	-
Computers	-	-	-	-	-	-	-
Accounting softw are	-	-	-	-	-	-	-
Other Office Equipment	-	-	-	-	-	-	-
4WD Vehicles	-	-	-	-	-	-	-
Subtotal Project Management Unit	-	-	-	-	-	-	-
B. M&E and Gender related activities							
1. M&E							
Baseline Survey	-	-	-	-	-	-	-
Review of Poverty, targeting and gender Strategy	-	-	-	-	-	-	-
Technical assistance	15 499	-	-	-	-	-	15 499
Completion Survey	-	-	-	-	-	-	-
Final evaluation	-	-	-	-	-	-	-
Annual M&E activities	-	-	-	-	-	-	-
Training /a	-	-	-	-	-	-	-
Subtotal M&E	15 499	-	-	-	-	-	15 499
2. Poverty and Gender Targeting Exercise							
Workshop /b	-	-	-	-	-	-	-
Tablets (android)	-	-	-	-	-	-	-
Field w ork and Data Analysis (Senior researchers)	-	-	-	-	-	-	-
Field w ork and Data Analysis (junior researchers)	-	-	-	-	-	-	-
Subtotal Poverty and Gender Targeting Exercise	-	-	-	-	-	-	-
Subtotal M&E and Gender related activities	15 499	-	-	-	-	-	15 499
C. Improving access to employment in agriculture and agro-processing /c	162 401	165 748	56 389	57 552	58 739	59 952	560 780
Total Investment Costs	177 899	165 748	56 389	57 552	58 739	59 952	576 279
II. Recurrent Costs							
A. Project Coordination Unit Staff							
1. Project Director	-	-	-	-	-	-	-
2. Monitoring & Evaluation Officer	-	-	-	-	-	-	-
3. Procurement Officer	-	-	-	-	-	-	-
4. Financial Manager	-	-	-	-	-	-	-
5. Accountant	-	-	-	-	-	-	-
6. Administration Assistant	-	-	-	-	-	-	-
7. Drivers	-	-	-	-	-	-	-
8. Incentives for ARD staff	-	-	-	-	-	-	-
Subtotal Project Coordination Unit Staff	-	-	-	-	-	-	-
B. PMU Operating Expenses							
Vehicles	-	-	-	-	-	-	-
Office O&M	-	-	-	-	-	-	-
Field Allow ances	-	-	-	-	-	-	-
Subtotal PMU Operating Expenses	-	-	-	-	-	-	-
Total Recurrent Costs	-	-	-	-	-	-	-
Total	177 899	165 748	56 389	57 552	58 739	59 952	576 279
\a loan							
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology							
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E							

H. Project Financing (LBP million)

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)																					
Table 1. C1: Enhancing competitiveness of smallholder dairy production:																					
Detailed Costs										**Expenditures by Financiers**											
(LBP '000)				**IFAD LOAN**								**The Government**						**FARMS**			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
I. Investment Costs																					
A. Extension																					
1. logistical support																					
vehicles for extension	125 628	-	-	-	-	-	125 628	67 646	-	-	-	-	-	67 646	-	-	-	-	-	-	-
vehicles for supervision (National level)	26 172	-	-	-	-	-	26 172	14 093	-	-	-	-	-	14 093	-	-	-	-	-	-	-
equipment for extension	350 957	-	-	-	-	-	350 957	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal logistical support	502 757	-	-	-	-	-	502 757	81 739	-	-	-	-	-	81 739	-	-	-	-	-	-	-
2. Preparation and production of training and learning materials																					
development of extension and training material (incl. graphic design)	-	27 984	-	-	-	-	27 984	-	-	-	-	-	-	-	-	-	-	-	-	-	-
production of extension and training material	40 433	-	-	-	-	-	40 433	0	-	-	-	-	-	0	-	-	-	-	-	-	-
Subtotal Preparation and production of training and learning materials	40 433	27 984	-	-	-	-	68 417	0	-	-	-	-	-	0	-	-	-	-	-	-	-
3. refresher training of AC staff on methodological and technical aspects	48 720	49 724	50 750	-	-	-	149 194	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. subcontracting NGOs for additional extension service delivery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210 667	215 301	220 038	224 879	229 826	1 100 711
Subtotal Extension	591 910	77 709	50 750	-	-	-	720 368	81 739	-	-	-	-	-	81 739	-	210 667	215 301	220 038	224 879	229 826	1 100 711
B. TVET																					
1. Selection of TVET participants	-	-	-	-	-	-	-	-	0	-	0	0	-	0	-	8 287	8 458	8 633	8 811	8 993	43 182
2. Support to development of specialized TVET dairy curricula	-	-	-	-	-	-	-	-	0	-	-	-	-	0	-	16 575	-	-	-	-	16 575
Subtotal TVET	-	-	-	-	-	-	-	-	0	-	0	0	-	0	-	24 862	8 458	8 633	8 811	8 993	59 757
C. Animal health																					
1. Revamping the national surveillance system and animal health database																					
International consultancy for system design	30 678	-	-	-	-	-	30 678	-	-	-	-	-	-	-	-	-	-	-	-	-	-
National consultancy for implementation support	-	14 256	14 569	14 890	15 217	15 552	74 484	-	-	-	-	-	-	-	-	-	-	-	-	-	-
re-vamping of softw are	32 346	-	-	-	-	-	32 346	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Server	19 408	-	-	-	-	-	19 408	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computer sets	54 989	-	-	-	-	-	54 989	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vehicles for surveillance and vaccination	251 256	-	-	-	-	-	251 256	135 292	-	-	-	-	-	135 292	-	-	-	-	-	-	-
data entry & maintainance of the system	-	19 008	19 426	19 853	20 290	20 736	99 312	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ear tags	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113 212	28 807	29 321	29 844	30 377	30 919	262 480
Subtotal Revamping the national surveillance system and animal health database	388 677	33 263	33 995	34 743	35 507	36 288	562 473	135 292	-	-	-	-	-	135 292	113 212	28 807	29 321	29 844	30 377	30 919	262 480
2. Providing laboratory kits for surveillance																					
post vaccination sero monitoring kits	-	-	-	-	-	-	-	-	-	0	-	0	-	0	61 458	62 553	63 668	64 804	65 961	67 139	385 583
sero surveillance kits and sample collection equipement	-	-	-	-	-	-	-	0	-	-	-	-	-	0	63 075	64 199	65 344	66 509	67 697	68 906	395 730
Subtotal Providing laboratory kits for surveillance	-	-	-	-	-	-	-	0	-	0	-	0	-	0	124 533	126 752	129 012	131 313	133 658	136 045	781 312
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases																					
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	167 385	171 068	174 831	178 677	182 608	186 626	1 061 196
Sanitary mandate for surveillance and vaccination- contracting veterinarians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230 155	235 218	240 393	245 681	251 086	256 610	1 459 144
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	397 540	406 286	415 224	424 359	433 695	443 236	2 520 340
Subtotal Animal health	388 677	33 263	33 995	34 743	35 507	36 288	562 473	135 292	-	0	-	0	-	135 292	635 285	561 845	573 557	585 516	597 729	610 201	3 564 132
Total Investment Costs	980 587	110 972	84 745	34 743	35 507	36 288	1 282 842	217 030	0	0	0	0	-	217 030	635 285	797 374	797 316	814 187	831 419	849 020	4 724 600
II. Recurrent Costs																					
A. strengthening Agricultural Centers' specialized human resources																					
Contracted livestock extension agents	116 240	237 594	242 821	248 163	253 623	259 202	1 357 643	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Improving the animal health status of the dairy herd and flock																					
1. Salary drivers	-	-	-	-	-	-	-	55 795	114 045	116 554	119 118	121 739	124 417	651 669	-	-	-	-	-	-	-
2. Running costs vehicles	-	-	-	-	-	-	-	29 232	59 669	60 900	62 156	63 438	64 748	340 143	-	-	-	-	-	-	-
Subtotal Improving the animal health status of the dairy herd and flock	-	-	-	-	-	-	-	85 027	173 714	177 454	181 274	185 177	189 165	991 812	-	-	-	-	-	-	-
Total Recurrent Costs	116 240	237 594	242 821	248 163	253 623	259 202	1 357 643	85 027	173 714	177 454	181 274	185 177	189 165	991 812	-	-	-	-	-	-	-
Total	1 096 827	348 566	327 566	282 906	289 130	295 491	2 640 485	302 058	173 714	177 454	181 274	185 177	189 165	1 208 842	635 285	797 374	797 316	814 187	831 419	849 020	4 724 600

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market

Detailed Costs																	Expenditures by Financiers				
(LBP '000)	IFAD LOAN							IFAD GRANT							The Government						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
I. Investment Costs																					
A. Supporting aggregation and value addition																					
1. On farm dairy processing																					
a. Production of training material (incl. graphic design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Printing of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
c. Equipment for training and demonstration purposes /a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-0
d. Thermometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	-0	0	0	0
e. Milk cans /b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	-	-	-	-	-
f. Cheese press	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-0	-0	-	-0
g. Dairy culture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-0	0	0	0	0
h. Training equipment kit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
i. Supplies for training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-0	0	-0	-0
j. Lactoscan /c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
k. pH/EC meter /d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
l. Training of trainers																					
Honorarium	3 410	-	3 552	-	-	-	6 963	-	-	-	-	-	-	-	0	-	-	-	-	-	0
m. Training of Households processors																					
Trainers fees (household producers)	-	48 730	49 735	50 761	51 808	52 877	253 911	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n. Coaching and mentoring																					
coach/trainer fees	-	71 278	72 846	74 449	76 087	77 761	372 421	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o. Training of trainers																					
Honorarium	3 410	-	3 552	-	-	-	6 963	-	-	-	-	-	-	-	0	-	-	-	-	-	0
Subtotal On farm dairy processing	6 821	120 008	129 686	125 210	127 895	130 638	640 257	-	-	-	-	-	-	-	0	-0	-0	-0	0	0	-0
2. Off farm dairy processing /e																					
a. Preparation and production of training and learning materials																					
Development of training material	16 173	-	-	-	-	-	16 173	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Printing of training material	12 938	-	-	-	-	-	12 938	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Supplies for training	-	3 292	-	3 411	-	-	6 703	-	-	-	-	-	-	-	-	0	-	0	-	-	0
Subtotal Preparation and production of training and learning materials	29 112	3 292	-	3 411	-	-	35 815	-	-	-	-	-	-	-	-	0	-	0	-	-	0
b. Equipment for processing units																					
Lactoscan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
pH/EC meter /f	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0
Thermometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
Dairy culture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
Subtotal Equipment for processing units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	-0
c. Coaching and mentoring																					
coach/trainer fees	-	33 150	33 833	34 531	35 244	35 971	172 728	-	-	-	-	-	-	-	-	0	-	0	0	-	0
d. Training of small and mid size processors																					
Trainers fees (processors)	-	23 205	-	24 172	-	-	47 376	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	29 112	59 647	33 833	62 113	35 244	35 971	255 919	-	-	-	-	-	-	-	-0	0	-	0	0	-	0
3. Supporting access to market																					
a. Development of a quality label for Lebanese cottage dairy products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Support product aggregation through improved operationality of cooperatives																					
Training of cooperatives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
coaching of cooperatives for management and access to market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
Subtotal Support product aggregation through improved operationality of cooperatives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
Subtotal Supporting access to market	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
4. Renewable energy applied to the dairy sectors /g	-	-	169 975	173 714	177 536	-	521 225	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting aggregation and value addition	35 932	179 655	333 494	361 037	340 674	166 609	1 417 402	-	-	-	-	-	-	-	0	-0	-0	-0	0	0	0
B. Improvement of access to Rural Finance																					
1. Sustainable dairy loan product(s)																					
Facilitated Dairy Market and Inclusive Finance Workshop	-	33 263	-	-	-	-	33 263	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Sustainable dairy loan product(s)	-	33 263	-	-	-	-	33 263	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Smallholder financial literacy																					
Development of Financial Literacy module for extension workers	-	24 862	-	-	-	-	24 862	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piloting of Financial Literacy module for extension workers	-	21 547	-	-	-	-	21 547	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Training of Trainers and extensionists on financial literacy	-	-	16 917	-	-	-	16 917	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Smallholder financial literacy	-	46 409	16 917	-	-	-	63 326	-	-	-	-	-	-	-	-	-	-	-	-	-	-

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs

(LBP '000)	FARMS							Beneficiaries						
	2000	2001	2002	2003	2004	2005	Total	2000	2001	2002	2003	2004	2005	Total
I. Investment Costs														
A. Supporting aggregation and value addition														
1. On farm dairy processing														
a. Production of training material (incl. graphic design)	12 292	-	-	-	-	-	12 292	3 073	-	-	-	-	-	3 073
b. Printing of training material	18 114	-	-	-	-	-	18 114	4 528	-	-	-	-	-	4 528
c. Equipment for training and demonstration purposes /a	38 815	39 507	-	-	-	-	78 323	-	-	-	-	-	-	-
d. Thermometer	6 469	6 585	6 702	6 821	6 943	7 067	40 588	1 617	1 646	1 675	1 705	1 736	1 767	10 147
e. Milk cans /b	194 077	197 535	-	-	-	-	391 613	48 519	49 384	-	-	-	-	97 903
f. Cheese press	-	-	20 106	61 393	124 978	-	206 477	-	-	5 026	15 348	31 245	-	51 619
g. Dairy culture	-	7 901	8 042	10 914	12 498	14 135	53 490	-	1 975	2 011	2 729	3 124	3 534	13 373
h. Training equipment kit	6 793	-	-	-	-	-	6 793	-	-	-	-	-	-	-
i. Supplies for training	-	3 687	3 753	3 820	3 888	3 958	19 106	-	922	938	955	972	989	4 777
j. Lactoscan /c	10 868	-	-	-	-	-	10 868	2 717	-	-	-	-	-	2 717
k. pH/EC meter /d	1 630	-	-	-	-	-	1 630	408	-	-	-	-	-	408
l. Training of trainers														
Honorarium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m. Training of Households processors														
Trainers fees (household producers)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n. Coaching and mentoring														
coach/trainer fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o. Training of trainers														
Honorarium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	289 059	255 216	38 603	82 949	148 308	25 160	839 294	60 863	53 927	9 651	20 737	37 077	6 290	188 545
2. Off farm dairy processing /e														
a. Preparation and production of training and learning materials														
Development of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Printing of training material	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Supplies for training	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Preparation and production of training and learning materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Equipment for processing units														
Lactoscan	124 210	-	-	-	-	-	124 210	31 052	-	-	-	-	-	31 052
pH/EC meter /f	20 702	-	-	-	-	-	20 702	5 175	-	-	-	-	-	5 175
Thermometer	311	-	-	-	-	-	311	78	-	-	-	-	-	78
Dairy culture	7 763	-	-	-	-	-	7 763	1 941	-	-	-	-	-	1 941
Subtotal Equipment for processing units	152 985	-	-	-	-	-	152 985	38 246	-	-	-	-	-	38 246
c. Coaching and mentoring														
coach/trainer fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d. Training of small and mid size processors														
Trainers fees (processors)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	152 985	-	-	-	-	-	152 985	38 246	-	-	-	-	-	38 246
3. Supporting access to market														
a. Development of a quality label for Lebanese cottage dairy products	-	-	75 396	76 742	78 112	-	230 250	-	-	-	-	-	-	-
b. Support product aggregation through improved operationality of cooperatives														
Training of cooperatives	-	41 437	42 291	43 164	44 054	44 964	215 910	-	-	-	-	-	-	-
coaching of cooperatives for management and access to market	-	8 287	8 458	8 633	8 811	8 993	43 182	-	-	-	-	-	-	-
Subtotal Support product aggregation through improved operationality of cooperatives	-	49 724	50 750	51 797	52 865	53 957	259 093	-	-	-	-	-	-	-
Subtotal Supporting access to market	-	49 724	126 146	128 538	130 977	53 957	489 342	-	-	-	-	-	-	-
4. Renew able energy applied to the dairy sectors /g	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting aggregation and value addition	442 044	304 940	164 749	211 487	279 285	79 116	1 481 621	99 109	53 927	9 651	20 737	37 077	6 290	226 791
B. Improvement of access to Rural Finance														
1. Sustainable dairy loan product(s)														
Facilitated Dairy Market and Inclusive Finance Workshop	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Assistance	-	237 594	242 821	-	-	-	480 415	-	-	-	-	-	-	-
Subtotal Sustainable dairy loan product(s)	-	237 594	242 821	-	-	-	480 415	-	-	-	-	-	-	-
2. Smallholder financial literacy														
Development of Financial Literacy module for extension w orkers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piloting of Financial Literacy module for extension w orkers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Training of Trainers and extensionists on financial literacy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Smallholder financial literacy	-	-	-	-	-	-	-	-	-	-	-	-	-	-

LEBANON
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market

Detailed Costs	IFAD LOAN							IFAD GRANT							Expenditures by Financiers: The Government						
(LBP '000)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
3. Rural Finance Intelligence																					
a. Assessment of inclusive rural finance																					
Research	56 957	-	-	-	-	-	56 957	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	11 523	-	-	-	-	11 523	-	-	-	-	-	-	-	-	0	-	-	-	-	0
Distribution	-	16 461	-	-	-	-	16 461	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of inclusive rural finance	56 957	27 984	-	-	-	-	84 942	-	-	-	-	-	-	-	-	0	-	-	-	-	0
b. Assessment of smallholder dairy financing																					
Research	-	33 263	-	-	-	-	33 263	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	11 523	-	-	-	-	11 523	-	-	-	-	-	-	-	-	0	-	-	-	-	0
Distribution	-	16 461	-	-	-	-	16 461	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of smallholder dairy financing	-	61 247	-	-	-	-	61 247	-	-	-	-	-	-	-	-	0	-	-	-	-	0
Subtotal Rural Finance Intelligence	56 957	89 231	-	-	-	-	146 189	-	-	-	-	-	-	-	-	0	-	-	-	-	0
4. Rural finance management /h	24 488	43 622	44 582	-	-	-	112 692	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Improvement of access to Rural Finance	81 445	212 526	61 499	-	-	-	355 470	-	-	-	-	-	-	-	-	0	-	-	-	-	0
C. Supporting a dairy stakeholder platform for inclusive policy dialogue																					
Initial national w orkshop	-	-	-	-	-	-	-	65 094	-	-	-	-	-	65 094	-	-	-	-	-	-	-
meetings of national platform	-	-	-	-	-	-	-	11 391	34 926	35 695	36 480	37 283	38 103	193 878	-	-	-	-	-	-	-
meetings of regional platform /i	-	-	-	-	-	-	-	-	49 895	50 992	52 114	53 261	-	206 262	-	-	-	-	-	-	-
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	-	-	-	-	-	-	76 486	84 821	86 687	88 594	90 543	38 103	465 234	-	-	-	-	-	-	-
Total Investment Costs	117 378	392 181	394 992	361 037	340 674	166 609	1 772 872	76 486	84 821	86 687	88 594	90 543	38 103	465 234	0	-0	-0	-0	0	0	0
II. Recurrent Costs																					
A. Supporting aggregation and value addition																					
1. On farm dairy processing																					
a. Coaching and mentoring																					
Perdiem and transport of coaches/trainers	-	11 880	12 141	12 408	12 681	12 960	62 070	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of Households processors																					
Perdiem and transport of participants	-	158 396	161 881	165 442	169 082	172 802	827 602	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	6 336	6 475	6 618	6 763	6 912	33 104	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	11 602	11 842	12 086	12 335	12 590	60 455	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of Households processors	-	176 334	180 198	184 146	188 180	192 304	921 161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c. Training of trainers																					
Perdiem	2 712	-	2 833	-	-	-	5 545	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	2 712	188 214	195 172	196 554	200 861	205 264	988 777	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Off farm dairy processing																					
a. Coaching and mentoring																					
Perdiem and transport for follow up and monitoring	-	6 336	6 475	6 618	6 763	6 912	33 104	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of small and mid size processors																					
Perdiem and transport of participants	-	35 481	-	37 059	-	-	72 540	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	4 435	-	4 632	-	-	9 067	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	6 630	-	6 906	-	-	13 536	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of small and mid size processors	-	46 546	-	48 598	-	-	95 143	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	-	52 882	6 475	55 215	6 763	6 912	128 247	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recurrent Costs	2 712	241 095	201 647	251 769	207 625	212 176	1 117 024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	120 090	633 277	596 639	612 806	548 299	378 785	2 889 896	76 486	84 821	86 687	88 594	90 543	38 103	465 234	0	-0	-0	-0	0	0	0

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

BANON
rmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
ble 2. C2: Improving small-scale value addition and access to market

tailed Costs																	Expenditures by Financiers						
3P '000)				IFAD LOAN							IFAD GRANT						The Government						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
3. Rural Finance Intelligence																							
a. Assessment of inclusive rural finance																							
Research	56 957	-	-	-	-	-	56 957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	11 523	-	-	-	-	11 523	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
Distribution	-	16 461	-	-	-	-	16 461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of inclusive rural finance	56 957	27 984	-	-	-	-	84 942	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
b. Assessment of smallholder dairy financing																							
Research	-	33 263	-	-	-	-	33 263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	11 523	-	-	-	-	11 523	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
Distribution	-	16 461	-	-	-	-	16 461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of smallholder dairy financing	-	61 247	-	-	-	-	61 247	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
Subtotal Rural Finance Intelligence	56 957	89 231	-	-	-	-	146 189	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
4. Rural finance management /h	24 488	43 622	44 582	-	-	-	112 692	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Improvement of access to Rural Finance	81 445	212 526	61 499	-	-	-	355 470	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	0
C. Supporting a dairy stakeholder platform for inclusive policy dialogue																							
Initial national w orkshop	-	-	-	-	-	-	-	65 094	-	-	-	-	-	65 094	-	-	-	-	-	-	-	-	-
meetings of national platform	-	-	-	-	-	-	-	11 391	34 926	35 695	36 480	37 283	38 103	193 878	-	-	-	-	-	-	-	-	-
meetings of regional platform /i	-	-	-	-	-	-	-	-	49 895	50 992	52 114	53 261	-	206 262	-	-	-	-	-	-	-	-	-
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	-	-	-	-	-	-	76 486	84 821	86 687	88 594	90 543	38 103	465 234	-	-	-	-	-	-	-	-	-
otal Investment Costs	117 378	392 181	394 992	361 037	340 674	166 609	1 772 872	76 486	84 821	86 687	88 594	90 543	38 103	465 234	0	-0	-0	-0	0	0	0	0	0
Recurrent Costs																							
A. Supporting aggregation and value addition																							
1. On farm dairy processing																							
a. Coaching and mentoring																							
Perdiem and transport of coaches/trainers	-	11 880	12 141	12 408	12 681	12 960	62 070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of Households processors																							
Perdiem and transport of participants	-	158 396	161 881	165 442	169 082	172 802	827 602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	6 336	6 475	6 618	6 763	6 912	33 104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	11 602	11 842	12 086	12 335	12 590	60 455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of Households processors	-	176 334	180 198	184 146	188 180	192 304	921 161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c. Training of trainers																							
Perdiem	2 712	-	2 833	-	-	-	5 545	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	2 712	188 214	195 172	196 554	200 861	205 264	988 777	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Off farm dairy processing																							
a. Coaching and mentoring																							
Perdiem and transport for follow up and monitoring	-	6 336	6 475	6 618	6 763	6 912	33 104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of small and mid size processors																							
Perdiem and transport of participants	-	35 481	-	37 059	-	-	72 540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	4 435	-	4 632	-	-	9 067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	6 630	-	6 906	-	-	13 536	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of small and mid size processors	-	46 546	-	48 598	-	-	95 143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	-	52 882	6 475	55 215	6 763	6 912	128 247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
otal Recurrent Costs	2 712	241 095	201 647	251 769	207 625	212 176	1 117 024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tal	120 090	633 277	596 639	612 806	548 299	378 785	2 889 896	76 486	84 821	86 687	88 594	90 543	38 103	465 234	0	-0	-0	-0	0	0	0	0	0

Equipments bought in different centers and localities of the project. !!!!!
40 l capacity
for training purposes.
for demonstration and training purposes.
Small and mid size processors
or demonstration and training purposes
Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
Third Party PMU Support.
Three per year.

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Table 2. C2: Improving small-scale value addition and access to market
Detailed Costs
(LBP '000)

	FARMS							Beneficiaries						
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**
3. Rural Finance Intelligence														
a. Assessment of inclusive rural finance														
Research	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of inclusive rural finance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Assessment of smallholder dairy financing														
Research	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Assessment of smallholder dairy financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Rural Finance Intelligence	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Rural finance management /h	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Improvement of access to Rural Finance	-	237 594	242 821	-	-	-	480 415	-	-	-	-	-	-	-
C. Supporting a dairy stakeholder platform for inclusive policy dialogue														
Initial national w orkshop	-	-	-	-	-	-	-	-	-	-	-	-	-	-
meetings of national platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-
meetings of regional platform /i	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Investment Costs	442 044	542 534	407 570	211 487	279 285	79 116	1 962 036	99 109	53 927	9 651	20 737	37 077	6 290	226 791
II. Recurrent Costs														
A. Supporting aggregation and value addition														
1. On farm dairy processing														
a. Coaching and mentoring														
Perdiem and transport of coaches/trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of Households processors														
Perdiem and transport of participants	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of Households processors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c. Training of trainers														
Perdiem	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal On farm dairy processing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Off farm dairy processing														
a. Coaching and mentoring														
Perdiem and transport for follow up and monitoring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Training of small and mid size processors														
Perdiem and transport of participants	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perdiem and transport of trainers	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renting facility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Training of small and mid size processors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Off farm dairy processing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Recurrent Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	442 044	542 534	407 570	211 487	279 285	79 116	1 962 036	99 109	53 927	9 651	20 737	37 077	6 290	226 791

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Table 3. C3: Project management and support

Detailed Costs	Expenditures by Financiers																			
(LBP '000)	IFAD LOAN							IFAD GRANT							The Government					
	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Total	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Total
I. Investment Costs																					
A. Project Management Unit																					
Office Refurbishing	32 346	-	-	-	-	-	32 346	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Furniture	24 260	-	-	-	-	-	24 260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computers	7 278	7 408	-	-	-	-	14 685	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounting software	40 433	-	-	-	-	-	40 433	-	-	-	-	-	-	-	0	-	-	-	-	-	0
Other Office Equipment	2 588	1 317	-	-	-	-	3 905	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4WD Vehicles	61 848	62 775	-	-	-	-	124 623	-	-	-	-	-	-	-	15 462	15 694	-	-	-	-	31 156
Subtotal Project Management Unit	168 752	71 500	-	-	-	-	240 252	-	-	-	-	-	-	-	15 462	15 694	-	-	-	-	31 156
B. M&E and Gender related activities																					
1. M&E																					
Baseline Survey	-	-	-	-	-	-	-	81 368	-	-	-	-	-	81 368	-	-	-	-	-	-	-
Review of Poverty, targeting and gender Strategy	-	-	-	-	-	-	-	65 094	-	-	-	-	-	65 094	-	-	-	-	-	-	-
Technical assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Completion Survey	-	-	-	-	-	-	-	-	-	-	-	-	90 721	90 721	-	-	-	-	-	-	-
Final evaluation	-	-	-	-	-	172 370	172 370	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual M&E activities	-	-	-	-	-	-	-	24 410	24 947	25 496	26 057	26 630	27 216	154 758	-	-	-	-	-	-	-
Training /a	14 616	14 917	15 225	15 539	15 860	-	76 157	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Subtotal M&E	14 616	14 917	15 225	15 539	15 860	172 370	248 526	170 872	24 947	25 496	26 057	26 630	117 937	391 941	-	-	-	-	0	-	0
2. Poverty and Gender Targeting Exercise																					
Workshop /b	8 120	-	-	-	-	-	8 120	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tablets (android)	8 087	-	-	-	-	-	8 087	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field work and Data Analysis (Senior researchers)	6 509	-	-	-	-	-	6 509	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field work and Data Analysis (junior researchers)	3 255	-	-	-	-	-	3 255	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Poverty and Gender Targeting Exercise	25 971	-	-	-	-	-	25 971	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal M&E and Gender related activities	40 587	14 917	15 225	15 539	15 860	172 370	274 497	170 872	24 947	25 496	26 057	26 630	117 937	391 941	-	-	-	-	0	-	0
C. Improving access to employment in agriculture and agro-processing /c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Total Investment Costs	209 339	86 417	15 225	15 539	15 860	172 370	514 749	170 872	24 947	25 496	26 057	26 630	117 937	391 941	15 462	15 694	-	-	0	-	31 156
II. Recurrent Costs																					
A. Project Coordination Unit Staff																					
1. Project Director	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74 393	76 030	77 703	79 412	81 159	82 945	471 642
2. Monitoring & Evaluation Officer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23 248	23 759	24 282	24 816	25 362	25 920	147 388
3. Procurement Officer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37 197	38 015	38 851	39 706	40 580	41 472	235 821
4. Financial Manager	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27 898	28 511	29 139	29 780	30 435	31 104	176 866
5. Accountant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18 598	19 008	19 426	19 853	20 290	20 736	117 911
6. Administration Assistant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18 598	19 008	19 426	19 853	20 290	20 736	117 911
7. Drivers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22 318	22 809	23 311	23 824	24 348	24 883	141 493
8. Incentives for ARD staff	46 496	47 519	48 564	49 633	50 725	51 840	294 777	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Project Coordination Unit Staff	46 496	47 519	48 564	49 633	50 725	51 840	294 777	-	-	-	-	-	-	-	222 250	227 140	232 137	237 244	242 463	247 798	1 409 032
B. PMU Operating Expenses																					
Vehicles	25 984	26 520	27 067	27 625	28 195	28 777	164 167	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office O&M	24 360	24 862	25 375	25 898	26 433	26 978	153 906	-	-	-	-	-	-	-	-	-	-	0	-	-	0
Field Allowances	108 490	110 877	113 316	115 809	118 357	120 961	687 812	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal PMU Operating Expenses	158 835	162 259	165 758	169 333	172 985	176 716	1 005 885	-	-	-	-	-	-	-	-	-	-	0	-	-	0
Total Recurrent Costs	205 331	209 778	214 322	218 965	223 709	228 557	1 300 662	-	-	-	-	-	-	-	222 250	227 140	232 137	237 244	242 463	247 798	1 409 032
Total	414 669	296 195	229 547	234 504	239 569	400 926	1 815 411	170 872	24 947	25 496	26 057	26 630	117 937	391 941	237 712	242 834	232 137	237 244	242 463	247 798	1 440 188

\a loan
\b Senior researchers will train Junior researchers. 4 day workshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E.

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Table 3. C3: Project management and support
Detailed Costs

(LBP '000)				FARMS			
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**Total**
I. Investment Costs							
A. Project Management Unit							
Office Refurbishing	-	-	-	-	-	-	-
Office Furniture	-	-	-	-	-	-	-
Computers	-	-	-	-	-	-	-
Accounting softw are	-	-	-	-	-	-	-
Other Office Equipment	-	-	-	-	-	-	-
4WD Vehicles	-	-	-	-	-	-	-
Subtotal Project Management Unit	-	-	-	-	-	-	-
B. M&E and Gender related activities							
1. M&E							
Baseline Survey	-	-	-	-	-	-	-
Review of Poverty, targeting and gender Strategy	-	-	-	-	-	-	-
Technical assistance	23 248	-	-	-	-	-	23 248
Completion Survey	-	-	-	-	-	-	-
Final evaluation	-	-	-	-	-	-	-
Annual M&E activities	-	-	-	-	-	-	-
Training /a	-	-	-	-	-	-	-
Subtotal M&E	23 248	-	-	-	-	-	23 248
2. Poverty and Gender Targeting Exercise							
Workshop /b	-	-	-	-	-	-	-
Tablets (android)	-	-	-	-	-	-	-
Field w ork and Data Analysis (Senior researchers)	-	-	-	-	-	-	-
Field w ork and Data Analysis (junior researchers)	-	-	-	-	-	-	-
Subtotal Poverty and Gender Targeting Exercise	-	-	-	-	-	-	-
Subtotal M&E and Gender related activities	23 248	-	-	-	-	-	23 248
C. Improving access to employment in agriculture and agro-processing /c	243 601	248 622	84 583	86 328	88 109	89 928	841 170
Total Investment Costs	266 849	248 622	84 583	86 328	88 109	89 928	864 418
II. Recurrent Costs							
A. Project Coordination Unit Staff							
1. Project Director	-	-	-	-	-	-	-
2. Monitoring & Evaluation Officer	-	-	-	-	-	-	-
3. Procurement Officer	-	-	-	-	-	-	-
4. Financial Manager	-	-	-	-	-	-	-
5. Accountant	-	-	-	-	-	-	-
6. Administration Assistant	-	-	-	-	-	-	-
7. Drivers	-	-	-	-	-	-	-
8. Incentives for ARD staff	-	-	-	-	-	-	-
Subtotal Project Coordination Unit Staff	-	-	-	-	-	-	-
B. PMU Operating Expenses							
Vehicles	-	-	-	-	-	-	-
Office O&M	-	-	-	-	-	-	-
Field Allow ances	-	-	-	-	-	-	-
Subtotal PMU Operating Expenses	-	-	-	-	-	-	-
Total Recurrent Costs	-	-	-	-	-	-	-
Total	266 849	248 622	84 583	86 328	88 109	89 928	864 418

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E.

I. Parameters

LEBANON													
Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)					Parameters (in %)								
Table 1. C1: Enhancing competitiveness of smallholder dairy production:	Breakdown of Totals Incl. Cont. (US$)				Phy.			Summary Divisions					
Detailed Costs		Local (Excl.	Duties &		Cont.	For.	Gross		Expenditure		Other Accounts		
	For. Exch.	Taxes)	Taxes	Total	Rate	Exch.	Tax Rate	Component	Account	Disb. Acct.	Fin. Rule	Proc. Acct.	Proc. Method
I. Investment Costs													
A. Extension													
1. logistical support													
vehicles for extension	83 752	-	45 097	128 849	5.0	65.0	35.0	PRODUCTION	VEHICLE_EA	VEH_DA	I_LOAN (100%)	VE_PA	LCB_PM (100%)
vehicles for supervision (National level)	17 448	-	9 395	26 844	5.0	65.0	35.0	PRODUCTION	VEHICLE_EA	VEH_DA	I_LOAN (100%)	VE_PA	LCB_PM (100%)
equipment for extension	139 801	94 170	-	233 971	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Subtotal logistical support	241 002	94 170	54 492	389 664									
2. Preparation and production of training and learning materials													
development of extension and training material (incl. graphic design)	11 116	7 540	-	18 656	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (50%), INTL_SHOPPING_PM (20%), LCL_SHOPPING_PM (30%)
production of extension and training material	16 106	10 849	-	26 955	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (50%), INTL_SHOPPING_PM (20%), LCL_SHOPPING_PM (30%)
Subtotal Preparation and production of training and learning materials	27 223	18 389	-	45 611									
3. refresher training of AC staff on methodological and technical aspects	19 619	79 844	-	99 463	5.0	20.0	0.0	PRODUCTION	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	CON_SRVCS_PM (100%)
4. subcontracting NGOs for additional extension service delivery	-	733 807	-	733 807	0.0	0.0	0.0	PRODUCTION	NTA_EA	TA_DA	FARMS (100%)	LTA_PA	CON_SRVCS_PM (100%)
Subtotal Extension	287 843	926 210	54 492	1 268 545									
B. TVET													
1. Selection of TVET participants	5 615	23 173	-	28 788	5.0	20.0	0.0	PRODUCTION	TRAINING	TRAIN_DA	FARMS (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
2. Support to development of specialized TVET dairy curricula	2 180	8 870	-	11 050	5.0	20.0	0.0	PRODUCTION	TRAINING	TRAIN_DA	FARMS (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Subtotal TVET	7 795	32 043	-	39 838									
C. Animal health													
1. Revamping the national surveillance system and animal health database													
International consultancy for system design	20 452	-	-	20 452	0.0	100.0	0.0	PRODUCTION	ITA_EA	TA_DA	I_LOAN (100%)	ITA_PA	CON_SRVCS_PM (100%)
National consultancy for implementation support	-	49 656	-	49 656	0.0	0.0	0.0	PRODUCTION	NTA_EA	TA_DA	I_LOAN (100%)	LTA_PA	CON_SRVCS_PM (100%)
re-vamping of softw are	12 885	8 679	-	21 564	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Server	7 731	5 208	-	12 938	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Computer sets	21 904	14 755	-	36 659	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Vehicles for surveillance and vaccination	167 504	-	90 194	257 698	5.0	65.0	35.0	PRODUCTION	VEHICLE_EA	VEH_DA	I_LOAN (100%)	VE_PA	ICB_PM (100%)
data entry & maintainance of the system	-	66 208	-	66 208	0.0	0.0	0.0	PRODUCTION	NTA_EA	TA_DA	I_LOAN (100%)	LTA_PA	CON_SRVCS_PM (100%)
Ear tags	104 057	70 930	-	174 987	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
Subtotal Revamping the national surveillance system and animal health database	334 533	215 436	90 194	640 163									
2. Providing laboratory kits for surveillance													
post vaccination sero monitoring kits	152 508	104 547	-	257 055	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
sero surveillance kits and sample collection equipement	156 521	107 299	-	263 820	5.0	60.0	0.0	PRODUCTION	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
Subtotal Providing laboratory kits for surveillance	309 029	211 846	-	520 875									
3. Support contracting of private veterinary practitioners for surveillance and control of public good diseases													
Sanitary mandate for surveillance and vaccination- contracting para veterinarians	-	707 464	-	707 464	0.0	0.0	0.0	PRODUCTION	NTA_EA	TA_DA	FARMS (100%)	LTA_PA	CON_SRVCS_PM (100%)
Sanitary mandate for surveillance and vaccination- contracting veterinarians	-	972 763	-	972 763	0.0	0.0	0.0	PRODUCTION	NTA_EA	TA_DA	FARMS (100%)	LTA_PA	CON_SRVCS_PM (100%)
Subtotal Support contracting of private veterinary practitioners for surveillance and control of public good diseases	-	1 680 226	-	1 680 226									
Subtotal Animal health	643 562	2 107 508	90 194	2 841 265									
Total Investment Costs	939 200	3 065 761	144 687	4 149 648									
II. Recurrent Costs													
A. strengthening Agricultural Centers' specialized human resources													
Contracted livestock extension agents	-	905 095	-	905 095	0.0	0.0	0.0	PRODUCTION	SAL	SAL_DA	I_LOAN (100%)	SAL_PA	NBF_PM (100%)
B. Improving the animal health status of the dairy herd and flock													
1. Salary drivers	-	434 446	-	434 446	0.0	0.0	0.0	PRODUCTION	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
2. Running costs vehicles	44 295	182 467	-	226 762	5.0	20.0	0.0	PRODUCTION	O&M_EA	O&M_DA	GOVT	OM_PA	NBF_PM (100%)
Total Recurrent Costs	44 295	1 522 008	-	1 566 303									
Total	983 495	4 587 769	144 687	5 715 951									

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)					Parameters (in %)								
Table 2. C2: Improving small-scale value addition and access to market	Breakdown of Totals Incl. Cont. (US$)				Phy.			Summary Divisions					
Detailed Costs		Local (Excl.	Duties &		Cont.	For.	Gross		Expenditure		Other Accounts		
	For. Exch.	Taxes)	Taxes	Total	Rate	Exch.	Tax Rate	Component	Account	Disb. Acct.	Fin. Rule	Proc. Acct.	Proc. Method
I. Investment Costs													
A. Supporting aggregation and value addition													
1. On farm dairy processing													
a. Production of training material (incl. graphic design)	6 120	4 123	-	10 243	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
b. Printing of training material	9 019	6 075	-	15 095	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
c. Equipment for training and demonstration purposes /a	31 156	21 059	-	52 215	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
d. Thermometer	20 067	13 756	-	33 823	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
e. Milk cans /b	194 723	131 621	-	326 344	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
f. Cheese press	101 811	70 253	-	172 065	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
g. Dairy culture	26 390	18 186	-	44 575	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
h. Training equipment kit	2 706	1 823	-	4 528	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
i. Supplies for training	9 434	6 488	-	15 922	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
j. Lactoscan /c	5 412	3 645	-	9 057	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
k. pH/EC meter /d	812	547	-	1 359	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
l. Training of trainers													
Honorarium	916	3 726	-	4 642	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
m. Training of Households processors													
Trainers fees (household producers)	33 017	136 256	-	169 274	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
n. Coaching and mentoring													
coach/trainer fees	-	248 281	-	248 281	0.0	0.0	0.0	MARKET	NTA_EA	TA_DA	I_LOAN (100%)	LTA_PA	CON_SRVCS_PM (100%)
o. Training of trainers													
Honorarium	916	3 726	-	4 642	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Subtotal On farm dairy processing	442 498	669 566	-	1 112 064									
2. Off farm dairy processing /e													
a. Preparation and production of training and learning materials													
Development of training material	6 442	4 340	-	10 782	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Printing of training material	5 154	3 472	-	8 626	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Supplies for training	2 655	1 813	-	4 469	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Subtotal Preparation and production of training and learning materials	14 252	9 625	-	23 876									
b. Equipment for processing units													
Lactoscan	61 848	41 660	-	103 508	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
pH/EC meter /f	10 308	6 943	-	17 251	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
Thermometer	155	104	-	259	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
Dairy culture	3 865	2 604	-	6 469	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (80%), BENEF (20%)	EQM_PA	LCB_PM (100%)
Subtotal Equipment for processing units	76 176	51 312	-	127 487									
c. Coaching and mentoring													
coach/trainer fees	22 461	92 691	-	115 152	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
d. Training of small and mid size processors													
Trainers fees (processors)	6 195	25 389	-	31 584	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Subtotal Off farm dairy processing	119 083	179 017	-	298 100									
3. Supporting access to market													
a. Development of a quality label for Lebanese cottage dairy products	90 953	62 547	-	153 500	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
b. Support product aggregation through improved operationality of cooperatives													
Training of cooperatives	28 076	115 864	-	143 940	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	FARMS (100%)	TRAIN_PA	LCB_PM (100%)
coaching of cooperatives for management and access to market	5 615	23 173	-	28 788	5.0	20.0	0.0	MARKET	TRAINING	EQUIP_DA	FARMS (100%)	EQM_PA	LCB_PM (100%)
Subtotal Support product aggregation through improved operationality of cooperatives	33 691	139 037	-	172 728									
Subtotal Supporting access to market	124 644	201 584	-	326 228									
4. Renew able energy applied to the dairy sectors /g	-	347 483	-	347 483	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	NCB_PM (100%)
Subtotal Supporting aggregation and value addition	686 225	1 397 650	-	2 083 875									

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)
Table 2. C2: Improving small-scale value addition and access to market

Detailed Costs	Breakdown of Totals Incl. Cont. (US$)				Parameters (in %)			Summary Divisions		Other Accounts			
	For. Exch.	Local (Excl. Taxes)	Duties & Taxes	Total	Phy. Cont. Rate	For. Exch.	Gross Tax Rate	Component	Expenditure Account	Disb. Acct.	Fin. Rule	Proc. Acct.	Proc. Method
B. Improvement of access to Rural Finance													
1. Sustainable dairy loan product(s)													
Facilitated Dairy Market and Inclusive Finance Workshop	-	22 175	-	22 175	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	NCB_PM (100%)
Technical Assistance	-	320 277	-	320 277	0.0	0.0	0.0	MARKET	NTA_EA	TA_DA	FARMS (100%)	LTA_PA	CON_SRVCS_PM (100%)
Subtotal Sustainable dairy loan product(s)	-	342 452	-	342 452									
2. Smallholder financial literacy													
Development of Financial Literacy module for extension w orkers	3 270	13 305	-	16 575	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Piloting of Financial Literacy module for extension w orkers	2 834	11 531	-	14 365	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Training of Trainers and extensionists on financial literacy	2 212	9 065	-	11 278	5.0	20.0	0.0	MARKET	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Subtotal Smallholder financial literacy	8 316	33 902	-	42 217									
3. Rural Finance Intelligence													
a. Assessment of inclusive rural finance													
Research	-	37 972	-	37 972	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	NCB_PM (100%)
Production	4 577	3 105	-	7 682	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Distribution	6 539	4 435	-	10 974	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Subtotal Assessment of inclusive rural finance	11 116	45 511	-	56 628									
b. Assessment of smallholder dairy financing													
Research	-	22 175	-	22 175	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	NCB_PM (100%)
Production	4 577	3 105	-	7 682	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Distribution	6 539	4 435	-	10 974	5.0	60.0	0.0	MARKET	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Subtotal Assessment of smallholder dairy financing	11 116	29 715	-	40 832									
Subtotal Rural Finance Intelligence	22 233	75 226	-	97 459									
4. Rural finance management /h	-	75 128	-	75 128	0.0	0.0	0.0	MARKET	NTA_EA	TA_DA	I_LOAN (100%)	LTA_PA	DIR_CONTRACT_PM (100%)
Subtotal Improvement of access to Rural Finance	30 548	526 708	-	557 257									
C. Supporting a dairy stakeholder platform for inclusive policy dialogue													
Initial national w orkshop	-	43 396	-	43 396	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
meetings of national platform	-	129 252	-	129 252	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	OTHER_PM (100%)
meetings of regional platform /i	-	137 508	-	137 508	5.0	0.0	0.0	MARKET	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Subtotal Supporting a dairy stakeholder platform for inclusive policy dialogue	-	310 156	-	310 156									
Total Investment Costs	716 773	2 234 515	-	2 951 288									
II. Recurrent Costs													
A. Supporting aggregation and value addition													
1. On farm dairy processing													
a. Coaching and mentoring													
Perdiem and transport of coaches/trainers	-	41 380	-	41 380	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
b. Training of Households processors													
Perdiem and transport of participants	-	551 735	-	551 735	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Perdiem and transport of trainers	-	22 069	-	22 069	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Renting facility	7 861	32 442	-	40 303	5.0	20.0	0.0	MARKET	O&M_EA	O&M_DA	I_LOAN (100%)	OM_PA	DIR_CONTRACT_PM (100%)
Subtotal Training of Households processors	7 861	606 246	-	614 107									
c. Training of trainers													
Perdiem	-	3 697	-	3 697	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Subtotal On farm dairy processing	7 861	651 323	-	659 184									
2. Off farm dairy processing													
a. Coaching and mentoring													
Perdiem and transport for follow up and monitoring	-	22 069	-	22 069	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
b. Training of small and mid size processors													
Perdiem and transport of participants	-	48 360	-	48 360	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Perdiem and transport of trainers	-	6 045	-	6 045	0.0	0.0	0.0	MARKET	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Renting facility	1 770	7 254	-	9 024	5.0	20.0	0.0	MARKET	O&M_EA	O&M_DA	I_LOAN (100%)	OM_PA	DIR_CONTRACT_PM (100%)
Subtotal Training of small and mid size processors	1 770	61 659	-	63 429									
Subtotal Off farm dairy processing	1 770	83 728	-	85 498									
Total Recurrent Costs	9 631	735 051	-	744 683									
Total	726 405	2 969 566	-	3 695 971									

\a Equipments bought in different centers and localities of the project. !!!!!
\b 40 l capacity
\c for training purposes.
\d for demonstration and training purposes.
\e Small and mid size processors
\f for demonstration and training purposes
\g Include staff costs of the selected implementing institution, equipment, travel costs, consultancies, reporting, final w orkshop and KM material on the piloting experience.
\h Third Party PMU Support.
\i Three per year.

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Harmonized Actions for Livestock Enhanced Production and Processing (HALEPP)					Parameters (in %)								
Table 3. C3: Project management and support	Breakdown of Totals Incl. Cont. (US$)				Phy.			Summary Divisions					
Detailed Costs		Local (Excl.	Duties &		Cont.	For.	Gross		Expenditure		Other Accounts		
	For. Exch.	Taxes)	Taxes	Total	Rate	Exch.	Tax Rate	Component	Account	Disb. Acct.	Fin. Rule	Proc. Acct.	Proc. Method
I. Investment Costs													
A. Project Management Unit													
Office Refurbishing	12 885	8 679	-	21 564	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (100%)
Office Furniture	9 664	6 509	-	16 173	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Computers	5 842	3 949	-	9 790	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (100%)
Accounting softw are	16 106	10 849	-	26 955	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (100%)
Other Office Equipment	1 554	1 049	-	2 603	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	NCB_PM (100%)
4WD Vehicles	83 082	-	20 770	103 852	5.0	80.0	20.0	PMU	VEHICLE_EA	VEH_DA	I_LOAN (100%)	VE_PA	ICB_PM (100%)
Subtotal Project Management Unit	129 132	31 035	20 770	180 938									
B. M&E and Gender related activities													
1. M&E													
Baseline Survey	-	54 245	-	54 245	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_GRANT(100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Review of Poverty, targeting and gender Strategy	-	43 396	-	43 396	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Technical assistance	-	15 499	-	15 499	0.0	0.0	0.0	PMU	NTA_EA	TA_DA	FARMS (100%)	LTA_PA	CON_SRVCS_PM (100%)
Completion Survey	-	60 481	-	60 481	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Final evaluation	-	114 913	-	114 913	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Annual M&E activities	-	103 172	-	103 172	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_GRANT (100%)	STUD_PA	OTHER_PM (100%)
Training /a	9 958	40 813	-	50 771	5.0	20.0	0.0	PMU	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Subtotal M&E	9 958	432 519	-	442 477									
2. Poverty and Gender Targeting Exercise													
Workshop /b	1 074	4 340	-	5 413	5.0	20.0	0.0	PMU	TRAINING	TRAIN_DA	I_LOAN (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Tablets (android)	3 221	2 170	-	5 391	5.0	60.0	0.0	PMU	EQUIP_EA	EQUIP_DA	I_LOAN (100%)	EQM_PA	LCB_PM (100%)
Field w ork and Data Analysis (Senior researchers)	-	4 340	-	4 340	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Field w ork and Data Analysis (junior researchers)	-	2 170	-	2 170	5.0	0.0	0.0	PMU	STUDIES_W_EA	STUD_DA	I_LOAN (100%)	STUD_PA	DIR_CONTRACT_PM (100%)
Subtotal Poverty and Gender Targeting Exercise	4 295	13 019	-	17 314									
Subtotal M&E and Gender related activities	14 253	445 538	-	459 790									
C. Improving access to employment in agriculture and agro-processing /c	110 161	450 619	-	560 780	5.0	20.0	0.0	PMU	TRAINING	TRAIN_DA	FARMS (100%)	TRAIN_PA	DIR_CONTRACT_PM (100%)
Total Investment Costs	253 546	927 192	20 770	1 201 509									
II. Recurrent Costs													
A. Project Coordination Unit Staff													
1. Project Director	-	314 428	-	314 428	0.0	0.0	0.0	PMU	PD_EA	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
2. Monitoring & Evaluation Officer	-	98 259	-	98 259	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
3. Procurement Officer	-	157 214	-	157 214	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
4. Financial Manager	-	117 911	-	117 911	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
5. Accountant	-	78 607	-	78 607	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
6. Administration Assistant	-	78 607	-	78 607	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
7. Drivers	-	94 328	-	94 328	0.0	0.0	0.0	PMU	SAL	SAL_DA	GOVT	SAL_PA	NBF_PM (100%)
8. Incentives for ARD staff	-	196 518	-	196 518	0.0	0.0	0.0	PMU	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Subtotal Project Coordination Unit Staff	-	1 135 872	-	1 135 872									
B. PMU Operating Expenses													
Vehicles	21 405	88 040	-	109 445	5.0	20.0	0.0	PMU	O&M_EA	O&M_DA	I_LOAN (100%)	OM_PA	NBF_PM (100%)
Office O&M	20 067	82 537	-	102 604	5.0	20.0	0.0	PMU	O&M_EA	O&M_DA	I_LOAN (100%)	OM_PA	NBF_PM (100%)
Field Allow ances	-	458 541	-	458 541	0.0	0.0	0.0	PMU	PD_EA	STAFF_INCENTIVES_DA	I_LOAN (100%)	INCENTI_PA	NBF_PM (100%)
Total Recurrent Costs	41 471	1 764 991	-	1 806 462									
Total	295 018	2 692 183	20 770	3 007 971									

\a loan
\b Senior researchers w ill train Junior researchers. 4 day w orkshop on methodology
\c Includes the cost of transportation, trainers, materials, operating cost of the 7 vocational schools, M&E

Appendix 10: Economic and financial analysis

I. Financial analysis

1. Both the financial and the economic analyses are based on dairy activity budgets. Eleven models relates to dairy and the support of dairy value chain activity models have been considered in the analysis. Individual livestock budgets have been used to calculate the value of production net of inputs and labor costs. Livestock models included in the analysis encompass sheep, goats, and cows models. Dairy activities could be adopted by smallholder dairy farmers and agro-pastoralists. Eleven models reflects different agro-ecological conditions in Lebanon are analysed:

   - Models 1 (4 cows sell to Hallab) and model 3 (4 cows direct sale). These models represent the most common dairy production system in Lebanon (around 90% of herds), who own between 2 and 5 cows. It is a zero grazing semi intensive production system. In the "without project" situation, animals produce 15 liters of milk per day, in 300 days, and fertility is low (0.83 calving per year). Animals are fed with teben and very high quantities of concentrate (12kg), which generates high feeding costs. In the "with project situation", milk productivity increases (20 kg per day) as well as the fertility (0.92), due to better feeding of animals (more quality fodder, less concentrate), which also reduces the feeding costs. In this system, a substantial part of the milk is consumed by the family. The main investments are the cow shed and the milking machine. The difference between the two sub-models is related to the marketing channel for milk. In the "sell to hallab" sub-system, the milk is sold through middle men, when it is sold directly in the neighborhood in the other system (in reality, most smallholder with 2 to 45 cows sell their milk directly). This has of course an important impact on the price of milk and total income.
   - Models 2 (7 cows sell to Hallab) and Model 4; (7 cows direct sale). These models represent the "better off" category of smallholder farmers who own between 6 and 10 cows. The system is slightly more intensive than the 4 cows model, with a daily production of 17 kg of milk per day and 22 with the project. Other characteristics are similar.
   - Model 5; (50 goats). This model is a traditional sedentary model commonly found in the Bekkaa, in the North and the South. It is integrated with agriculture (valorization of by crop products) and the use of rangelands is limited. Milk productivity is low (0.75 liters in 150 days), and mortality of kids is very high (30%) due enterotoxaemia and pasteurellosis. In the with project situation, mortality of kids is reduced to 10 % through vaccination and preventive health care measures, and better management and animal feeding improves productivity and lactation duration.
   - Model 6; (120 sheep (Awassi), transhumant system); this model is traditional and commonly found in the Bekkaa too. Animals are grazed in the mountains during summer, where a temporary camp is established. Producers have no land and pay a rent for accessing rangelands Animals are kept mostly for meat production and milk productivity is very low (0.5 kg per day during 90 days). Mortality of lambs is very high too for similar sanitary reasons. In the with project situation, the daily production reaches 0.8 per day and the lactation duration is increased (110 days).
   - Model 7 is a combination of Model 3 with 5. Model 7 encompasses a combination of cattle-small ruminant model with 4 cows and 50 small ruminants (50 adult female goats (Baladi). This model aims at showing the complementarity between small ruminants in a sedentary system with cattle.

2. Four processing units models are identified: Model 7 (500 liter off-farm milk processing to yogurt (leben), Model 8 (off-farm 500 liter milk processing to Lebneh), Model 9 (off-farm

5,000 l per day milk processing), and Model 10 (off-farm milk processing into new dairy products-5,000 l daily capacity).

3. In the "with project" situation, per unit livestock technical parameters are assumed to augment due to project interventions at the farm level through the enhancing competitiveness of smallholder dairy production (Extension and animal health). The Milk production is expected to increase by 50% on average. Small ruminant milk production increase characterizes the actual poor level of husbandry. The quantity of milk sold increases in all dairy models (144% for goats, 72% for sheep and 49-58% for cows).

4. All activities developed by HALEPP are expected to increase from the WOP (without project) to the WP (with project) situation. For activity models for dairy/processing units, the impact of improved practices is quite immediate as the actual level of input use is low. These increases are due to factors related to the use of new technology and new agricultural practices. The improvement of productivity in targeted farms helps to improve farmer's income, attenuate poverty risks, creates job opportunities and contributes to household food security. Dairy products have been selected because of their significance in the prevailing agricultural system and their potential for local market.

5. In terms of inputs costs used by farmers, feeding cost feeding cost per cow per year represents one of the main costs. In these five models, the tendency is at an increase for fodder use and a decrease for concentrate by comparing the development period of the WP with the WOP situation (Table 1). Sheep are not using the concentrate and fodder as they are under an extensive livestock management.

Table 1: Feeding costs: comparison of traditional ration and improved ration

	Unit price (LBP)	**Quantity Traditional ration**	**Quantity improved ration**
Teben	**450**	**5**	**5**
Alfalfa hay	500		2
Corn silage	190		8
Concentrate (dairy mix)	**450**	**12**	**5**
Daily cost of ration		7,650	7,020
Number of liters allowed per ration		15	20
Feed cost per liter of milk		510	351

6. The adoption rate in all models follows an S shaped functional form translating the learning curve of the targeted farmers and small/median processors. It is 5% in year 1, 20% in year 2, 55% in year 3, 85% in year 4, 95% in year 5, and 100% in year 6 (table 2). The development period is attained at year 6 for all models. The number of animals and SMEs are presented in Table 2 below.

Table 2: Cumulative number of Households (HH) and units (animals/SMEs)

Model	Adoption rate (%)	Total HH	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-15
			5%	10%	20%	30%	40%	50%	60%	70%	80%
Model 1	4 cows sell to Hallab	720	36	72	144	216	288	360	432	504	576
Model 2	7 cows sell to hallab	480	24	48	96	144	192	240	288	336	304
Model 3	4 cows process direct sale	860	43	86	172	258	344	430	516	602	688
Model 4	7 cows process direct sale	240	12	24	48	72	96	120	144	168	192
Total cattle producers targeted		2,400*	115	230	460	690	920	1,150	1,380	1,610	1,760
Model 5	Sedentary goat producers (70%)	1,120	56	112	224	336	448	560	672	784	896
Model 6	Sheep (20%)	320	16	32	64	96	128	160	192	224	256
Model 7	mixed Model : 50 Goats &	160	8	16	32	48	64	80	96	112	128
	4 cows (M3 B)	100	5	10	20	30	40	50	60	70	80
Total Small ruminants		1,600**	72	144	288	432	576	720	864	1,008	1,280

* Including the 4cows model that is part of the mixed model 7.
** Including the 50 goat model that is part of the mixed model 7.

7. Dairy activities show high financial returns. This is due to a combination of factors including relatively low incidence of diseases at the proposed elevations beside the proposed project activities. Net income per animal per year is around 50% on average. The good results are achieved despite the relatively high cost of inputs including feeding cost per animal and labor costs. All financial indicators at the crop level (FIRR, NPV, and BCR) denote financial feasibility at activity level. The IRR range from 18.3% to 25.7% for the four cows models, and a positive financial net present value (FNPV) ranging between USD 3.9 and 8.2 million.

8. The IRR for the two small ruminant models is 14.7% to 19.8% respectively for goat and sheep models with positive FNPV (USD 0.6 and 1.7 million). The mixed model presents a higher IRR and FNPV (25.2% and USD 16 million). The dairy SMEs models (small and medium processing units) identified are proxies based on the potential of each zone, and mission interviews in the field with small scale investments by rural entrepreneurs and other value chain stakeholders that would allow a better access by project beneficiaries to markets. This includes agribusinesses, cooperatives, and associations. The combined financial indicators of different SMEs (Table 3) present good financial performances in terms of FIRR (15.2%) and positive NPV at an OCC of 9% (USD 7.5 million).

Table 3: Financial analysis of HALEPP dairy models

Item	Models	Total HH per model*	FIRR	NPV ('000 USD)
Model 1	4 cows sell to Hallab	720	18,6%	2,961,9
Model 2	7 cows sell to hallab	480	22,1%	7,040,5
Model 3	4 cows process direct sale	860	24,0%	7,041,6
Model 4	7 cow process direct sale	240	17,1%	4,370,1
Model 5	Sedentary goat producers	1,120	10,0%	2,16
Model 6	Sheep	320	10,0%	0,0973
Model 7	mixed Model (Model 3 /Model 5)	160/100		
Model 8	500 liter yogurt (leben)	48	12,85%	6,932,9
Model 9	500 liter Lebneh	48	15,3%	2,688,1
Model 10	5000 liter	16	14,5%	4,905,4
Model 11	5000 l new dairy products	16	20,2%	6,262,1

*80% of total processing unit from year 9 to 15.

9. **Employment.** Employment is a second development Objective of the HALEPP that aims at increasing employment opportunities of young Lebanese in communities affected by the Syrian crisis and young Syrian refugees living in these communities. This is translates in terms of Outputs by improved access to employment in agriculture and agro-processing. This is in the framework of the FARMS facility to help Lebanon coping with the Syrian crisis in order to create among other things at least 500,000 days of temporary work and at least 20,000 employment opportunities, primarily for youth. The computation of the employment opportunities created per livestock and processing units models developed by HALEPP (Table 4) indicates that around 12600 employment will be created with 85% will be created in the livestock farming system (Models 1 to 7) while 25% will be created through processing models (Models 8 to 11).

Table 4: Employment opportunities created per livestock and processing models

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-15
Model 1	108	216	432	648	864	1,080	1,296	1,512	1,728
Model 2	72	144	288	432	576	720	864	1,008	1,152
Model 3	144	288	576	864	1,152	1,440	1,728	2,016	2,304
Model 4	36	72	144	216	288	360	432	504	576
Model 5	168	336	672	1,008	1,344	1,680	2,016	2,352	2,688
Model 6	48	96	192	576	768	960	1,152	1,344	1,536
Model 7	39	78	156	234	312	390	468	546	594
Model 8	27	108	216	324	432	540	540	540	540
Model 9	27	108	216	324	432	540	540	540	540
Model 10	42	84	168	252	336	420	420	420	420
Model 11	42	84	168	252	336	420	420	420	420
Total employment (cumulative)	753	1614	3,228	5,130	6,840	8,550	9,876	11,202	12,498

II. Economic analysis of the project

10. **Costs-benefit streams.** The objectives of the economic analysis are: (i) to assess the overall programme viability; and (ii) to estimate the programme's impact by calculating the economic rate of return (EIRR) and the economic net present value ((ENPV) . The computation of economic costs is derived from financial project costs, by excluding transfers such as duties, taxes, and price contingencies.

11. The cost-benefit streams were obtained from dairy production in seven governorates of Lebanon: Mount Lebanon, North, Akkar, Bekaa, Baalbek-Hermel, Nabatieh and South. The streams of incremental benefits show highly profitable dairy production especially with higher inputs use, and diversification to more profitable products.

Economic Internal Rate of Return (EIRR)

12. **Assumptions**. The economic analysis consists of aggregating all project costs and projected benefits from the eleven models of dairy and processing units in order to evaluate project

impact. Details of the Economic analysis are presented in Annexes. The following assumptions were used:

i) The analysis is undertaken in constant terms, so that price contingencies were excluded from the economic analysis but physical contingencies were included. Constant exchange rate of LBP 1,500 per USD has been adopted for the 15 life-time of the project. The project benefit stream is assumed to occur with no residual values;

ii) The opportunity cost of capital is assumed at 9%, higher than the 7.08% long maturities deposit rate of 7.08% estimated by the Lebanon Central Bank (LCB) to take into account the country risk and the currency risk on Lebanon.[32] This rate is relaxed in the sensitivity analysis to see the impact on the worthiness of the WSAP;

iii) Post-project completion and recurrent costs are considered as 30% of recurrent cost of year 6. This means that the Government of Lebanon (GoL), targeted seven governorates and municipalities, local institutions and beneficiaries (cooperatives and associations) would take care of the recurrent costs of the project implementation period over the economic life-period of the Project;

iv) Labour cost has been shadow priced to stand for market imperfections. Employment opportunities in the project area are relatively limited; therefore the opportunity cost of farm labor is low. Hence, the related labor financial price is adjusted downward by using a standard conversion factor of 0.75. This factor was used in similar projects and programmes in Lebanon such as HASAD project (2010) and HASAD supplementary fund (2012); and

v) Inputs and outputs are adjusted in the economic analysis by eliminating taxes as transfer payments for tradable items. The flat tax rate applied is 11%.

13. The main sources of quantified benefits of HALEPP are expected to be: i) improved production and productivity of dairy activity models due to the application of improved inputs and improved agricultural practices; ii) an increased proportion of marketed dairy products such as yogurt (leben), lebneh and diversified dairy products (hallumi, baladi, White cheese with herbs). These dairy products are attracting higher prices as a result of the demand by local and urban consumers in different regions of Lebanon.

14. The EIRR on the investments in the HALEPP Project area over 15 years is estimated at 16.2% (Table 5). The Net present value (NPV) of the project is positive (USD 22.2 million) and the Benefit-cost ratio is 3.2. The economic analysis suggests that the HALEPP project is feasible. An estimate made over 20 years economic life time of the project would generate an EIRR greater than that the 15 years period and a higher NPV. With an opportunity cost of capital (OCC) of 10%, the NPV is still positive. All these worthiness indicators establish the economic feasibility of the project. An opportunity cost of farm labor of 0.85 still yields an EIRR.

[32] The LCB used a long-term fixed deposit rate of 7.08% for 7 years, 6.74 % for five years, 6.5% for three years, and 5.35% for one year.

Table 5: Project Economic Cost-benefit streams and EIRR

	Y1	Y2	Y3	Y4	Y5	Y6	EIRR	ENPV
Model 1	- 3 543 721	35 343	215 189	550 239	868 010	1 338 099	24,7%	5,9
Model 2	- 4 007 291	- 333 105	131 654	455 286	920 527	1 288 757	19,9%	4,4
Model 3	- 4 792 770	- 89 315	6 255	294 372	552 063	990 630	11,6%	1,0
Model 4	- 2 105 670	- 42 908	31 410	231 469	559 141	823 996	22,6%	3,0
Model 5	- 2 324 825	- 390 017	- 421 048	- 51 011	764 807	2 073 847	31,5%	9,4
Model 6	- 450 881	7 420	22 587	47 189	82 633	130 513	25,1%	0,9
Model 7	- 831 365	- 65 020	- 59 498	23 376	166 765	399 454	22,9%	1,4
total Livestock	- 18 056 522	- 877 603	- 73 450	1 550 922	3 913 946	7 045 295	22,1%	26,1
Total processing Units	- 365 117	- 1 142 550	- 3 743 650	- 7 543 590	391 706	537 176	19,1%	7,8
Total additional benefit	- 18 421 639	- 2 020 153	- 3 743 650	- 5 992 668	4 305 653	7 582 471		
Economic costs	2 626 925	2 315 010	2 065 075	1 795 485	1 797 585	1 620 135		
Total	**- 21 048 564**	**- 4 335 163**	**- 5 808 725**	**- 7 788 153**	**2 508 068**	**5 962 336**	**16,2%**	**22,2**

15. Table 5 shows that all dairy models depict an EIRR greater than the OCC and a positive ENPV. The later range from 11.6% to 25.1% with an average for all livestock models of 22.1%. The EIRR for processing units is around 19.1% (range from 10.1% to 34.8%).

16. **Sensitivity analysis.** The sensitivity analysis performed shows the robustness of the profitability of the project in case of an increase of costs, or decrease of expected benefits.

17. In terms of a break-even analysis, targeting the EIRR of 9% threshold, cost should increase up to 270% or benefits should drop to 73%. A specific sensitivity was done to assess the change of in the value of price of milk, feed and labor. An increase/decrease of these inputs by 5%, 10% 20% still yield a profitable project. The breakeven analysis shows that the price of milk needs to decrease at least four times in order to have a significant impact on the EIRR (be close to 9%).

18. The broad sensitivity analysis shows the robustness of the project facing an increase in costs or a decrease in cost (Table 6) and even in case of a simultaneous change on both costs and benefits. Table below shows that the critical threshold of 9% (representing the opportunity cost of capital) is not reached when he benefits decrease with 20% or when the costs increase with the same amount.

Table 6: Sensitivity to cost increase and benefit decrease of HALEPP project

	EIRR	NPV (USD Million)
Base	16,20%	22,20
Costs + 5%	16,31%	22,85
Costs + 10%	16,10%	22,33
Costs + 20%	15,69%	21,28
Benefits - 5%	16,30%	21,69
Benefits -10%	16,05%	19,99
Benefits - 20%	15,49%	16,60

19. Moreover, at this level of the analysis, the project is slightly more sensitive to the decrease of the benefits than to the increase of its cots. Using goal seek function, the level of decrease on the benefit should reach more than 70% in order to drop the EIRR less than 9%.

20. The feed cost increase by 10%, 20%, and 30% in feed cost (fodder and concentrate cost) have been tested for livestock models and showed that the project is still worthy and the impact of feed cost rise on project profitability is limited (Table 7).

Table 7: Impact of feed cost rise on EIRR of livestock Models and project profitability

	Base EIRR (%)	Increase of 10%	Increase of 20%	Increase of 50%
Model 1	24.7	24.5	24.3	23.8
Model 2	19.9	19.4	18.8	17.1
Model 3	11.2	10.5	11.9	11.9
Model 4	22.6	22.1	21.5	20.0
Model 5	31.5	21.4	19.3	12.4
Model 6	25.1	25.1	25.1	25.1
Model 7	22.7	15.8	15.5	10.1
EIRR	16.2	16.2	14.4	14.4

21. The risk of delay in benefit was tested for one, two, and three years. The project is still feasible as the EIRR is respectively, 14,9%, 12,9%, and 10,7% (Table 8).

Table 8. Impact of delayed accrual benefits on project worthiness (USD)

Delay In benefit by :		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6+	Year 15	EIRR (%)
one year	total add. benefit	-	- 18 421 639	- 2 020 153	- 3 743 650	- 5 992 668	4 305 653	17 607 455	
	total add. net benefit	- 2 626 925	- 20 736 649	- 4 085 228	- 5 539 135	- 7 790 253	2 685 518	17 283 428	14,9
Two years	total add. benefit	-		- 18 421 639	- 2 020 153	- 3 743 650	- 5 992 668	16 948 004	
	total add. net benefit	- 2 626 925	- 2 315 010	- 20 486 714	- 3 815 638	- 5 541 235	- 7 612 803	16 623 977	12,9
Three years	total add. benefit	-	-	-	- 18 421 639	- 2 020 153	- 3 743 650	13 352 435	
	total add. net benefit	- 2 626 925	- 2 315 010	- 2 065 075	- 20 217 124	- 3 817 738	- 5 363 785	13 028 408	10,7

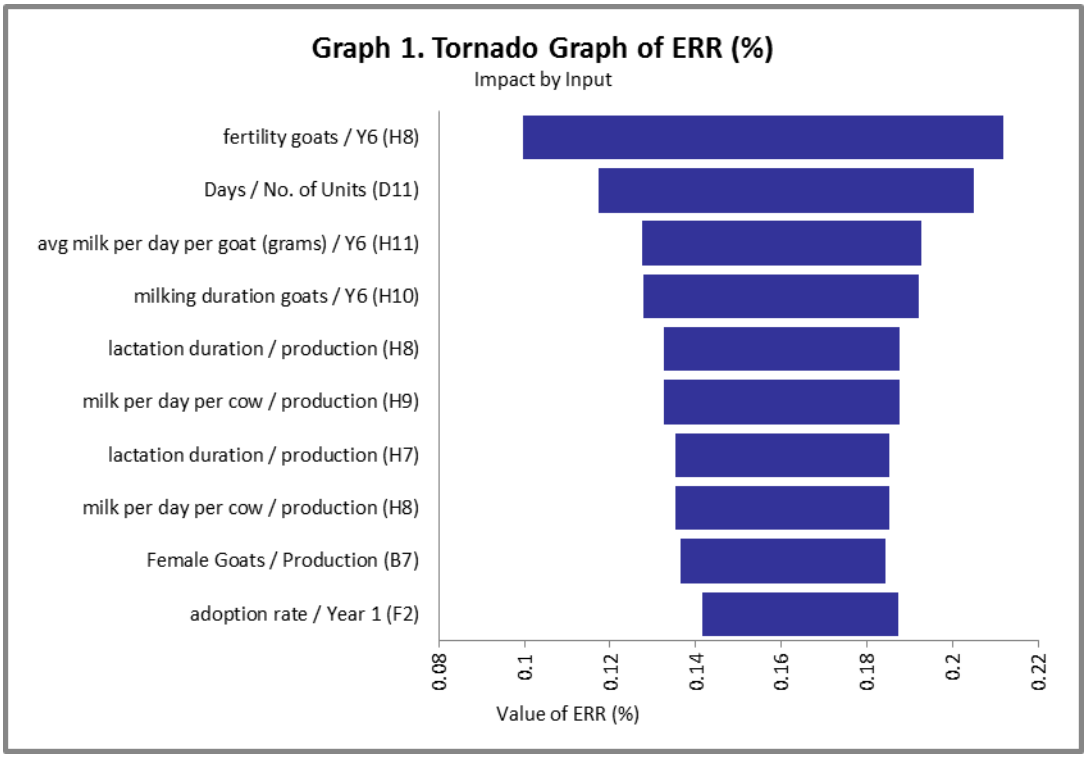
22. The sensitivity tests of the project suggest that the project is robust and worthwhile, especially if we consider the conservative assumptions made in the computation of the benefits. The project therefore has a positive impact on household welfare and allows smallholder dairy producers and processors a higher propensity to participate to its activities. Moreover, the project will have a multiplier effect and higher marketing value added.

23. Going a step further into the sensitivity analysis, we change the costs and the benefits simultaneously in order to see their impact on the overall profitability of the project. Table 9 shows that the project stays economically profitable even in the worst case scenario (Costs + 20% Benefits - 20%) with a strong EIRR 14.51%. But an increase of costs by 30% with a simultaneous decrease in benefits by 20% and more will generate an EIRR less than the OCC.

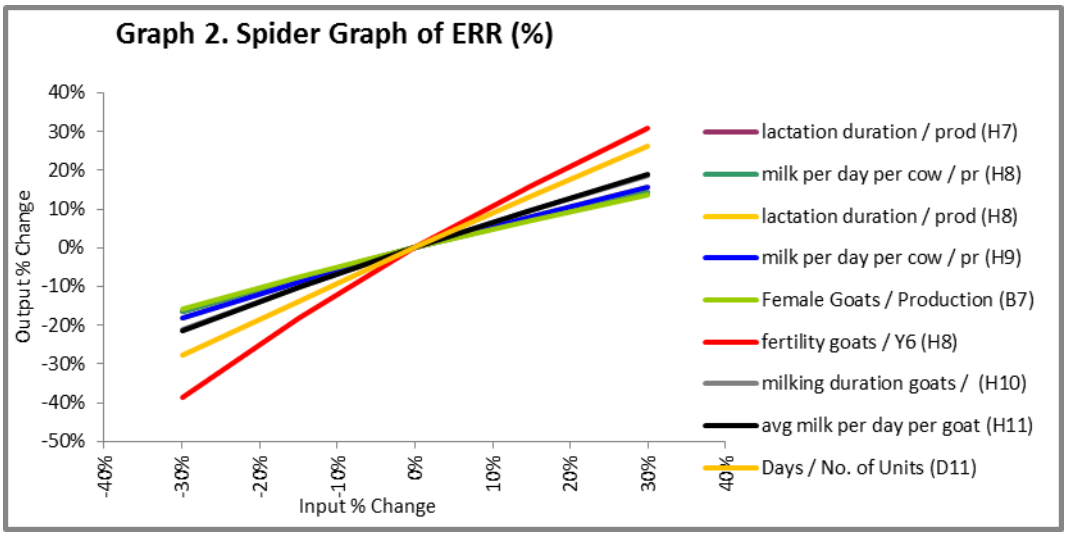
Table 9. Sensitivity to simultaneous cost increase and benefit decrease of HALEPP

	IRR	NPV
Costs + 5% Benefits - 5%	16,08%	21,16
Costs + 10% Benefits - 5%	15,86%	20,63
Costs + 20% Benefits - 5%	15,44%	19,58
Costs + 5% Benefits -10%	15,83%	19,46
Costs + 10% Benefits -10%	15,60%	18,94
Costs + 20% Benefits -10%	15,16%	17,89
Costs + 5% Benefits - 20%	15,24%	16,07
Costs + 10% Benefits - 20%	14,99%	15,55
Costs + 20% Benefits - 20%	14,51%	14,50

24. **Specific Sensitivity Analysis.** Although changing overall costs and benefits of the project in a deterministic environment is useful, it has limited interpretation. Knowing which particular inputs may influence the EIRR has great use to project management. Conducting specific sensitivity analysis using TopRank shows that models M2, M3, M5, and M10 are the most influential models in this project. The rest of the models have a little to no influence on the EIRR.



25. The Tornado graph shows that the bigger the blue bar, the bigger the influence. As we can see that the project depends on the fertility of goats in the Model 5, where a decrease of 30% causes a pivotal drop of the EIRR: from 16.4% to 9.96%. The limitation of the graph above is that it doesn't inform us about the direction of change. The Spider graph below completes the information. Each line represents the direction of change. The positive slope indicates a positive correlation between the inputs and the output numbers.



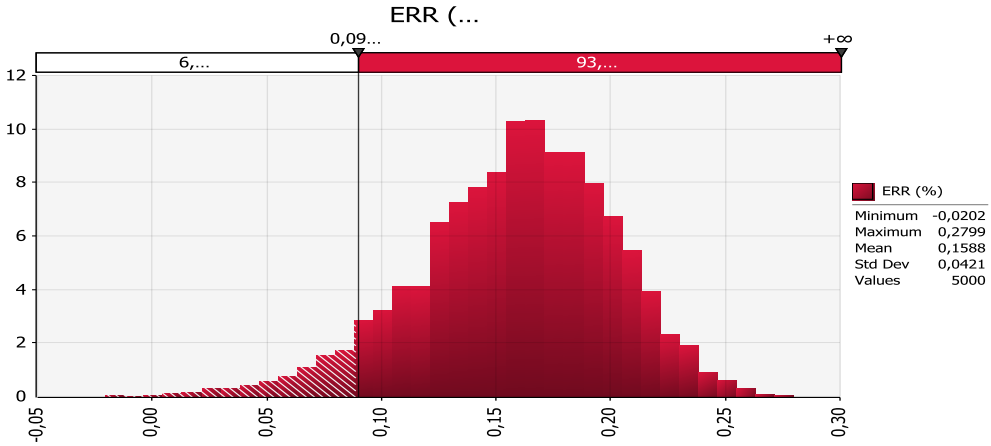
26. For example, Fertility of goats has a positive slope, the increase of the input of 30% causes an increase of the EIRR of 30% bringing to 21,2%.Livestock fertility and lactation are the most influential parameters in the project, and more focus should be drawn to them in order to ensure the profitability of the project. In addition, from the list of the most influential inputs, it

seems that the technical side of production is more influential to deal with markets the uncertainty.

27. **Risk Analysis.** The Monte Carlo Simulation was used to change different inputs at the same time according to their respective probability distribution, resulting to a probability distribution of the desired output (EIRR, ENPV, B/C ratio).

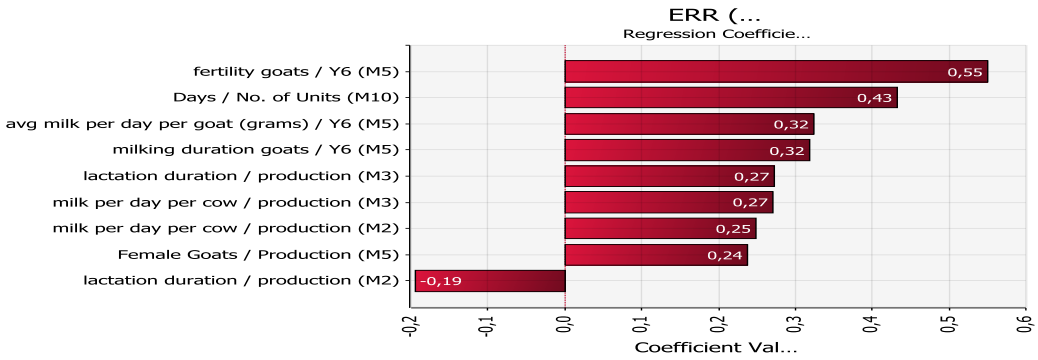
28. The probability distribution of the EIRR (Graph 3) shows that there is 93,6% chance of having a positive EIRR greater than 9%, that in the best case scenario might reach 27,9% where all inputs have a the most desired values. The shape of the curve, skewed to the right, shows that the project have more chances to turn economically viable than not. Within the probabilistic context the most likely value of the EIRR is 15.88%.

Graph 3. Probability distribution of the EIRR of HALEPP project



29. The figure below ranks the inputs based on the impact on the standard deviation of the EIRR.[33] The larger the bar, the more impact is on the viability of the project. For example, a one unit change in the standard deviation of fertility of goats in Model 5 will increase the variability of the EIRR with +0.55.This is particularly useful in evaluating uncertainty. Meaning that these parameters have an inflating effect on the uncertainty in the calculation of EIRR. Having a better measure, may improve our appreciation to risk and the effects of the project.

Graph 4. Regression of EIRR on the most influencing project variables



[33] In other words, how each input affects the distribution of the EIRR. Each variation of one unit of standard deviation of input is shown with the value of the impact on the standard variation of the EIRR.

Annexes

1. Sensitivity analysis
2. Specific Sensitivity Analysis
3. What-if Analysis Summary for Output EIRR (%)
4. Risk Analysis (EIRR and ENPV)
5. Economic analysis models

Annex 1: Sensitivity analysis

NPV

"Variable by Variable" Analysis	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
5% Costs + 5%	2,76	2,43	2,17	1,89	1,89	1,70	0,34	0,34	0,34	0,34	0,34	0,34	0,34	0,34	0,34
10% Costs + 10%	2,89	2,55	2,27	1,98	1,98	1,78	0,36	0,36	0,36	0,36	0,36	0,36	0,36	0,36	0,36
20% Costs + 20%	3,15	2,78	2,48	2,15	2,16	1,94	0,39	0,39	0,39	0,39	0,39	0,39	0,39	0,39	0,39
30% Costs + 30%	3,42	3,01	2,68	2,33	2,34	2,11	0,42	0,42	0,42	0,42	0,42	0,42	0,42	0,42	0,42
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60% Costs + 60%	4,20	3,70	3,30	2,87	2,88	2,59	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,52
90% Costs + 90%	4,99	4,40	3,92	3,41	3,42	3,08	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62	0,62
99% Costs + 99%	5,23	4,61	4,11	3,57	3,58	3,22	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
5% Benefits - 5%	- 17,50	- 1,92	- 3,56	- 5,69	4,09	7,20	11,79	13,28	18,51	14,55	6,24	12,68	16,10	16,73	17,22
10% Benefits -10%	- 16,58	- 1,82	- 3,37	- 5,39	3,88	6,82	11,17	12,58	17,54	13,79	5,91	12,02	15,25	15,85	16,32
20% Benefits - 20%	- 14,74	- 1,62	- 2,99	- 4,79	3,44	6,07	9,93	11,18	15,59	12,26	5,26	10,68	13,56	14,09	14,50
60% Benefits - 60%	- 7,37	- 0,81	- 1,50	- 2,40	1,72	3,03	4,96	5,59	7,80	6,13	2,63	5,34	6,78	7,04	7,25
69% Benefits -65%	- 5,67	- 0,62	- 1,15	- 1,85	1,33	2,34	3,82	4,31	6,00	4,72	2,02	4,11	5,22	5,42	5,58

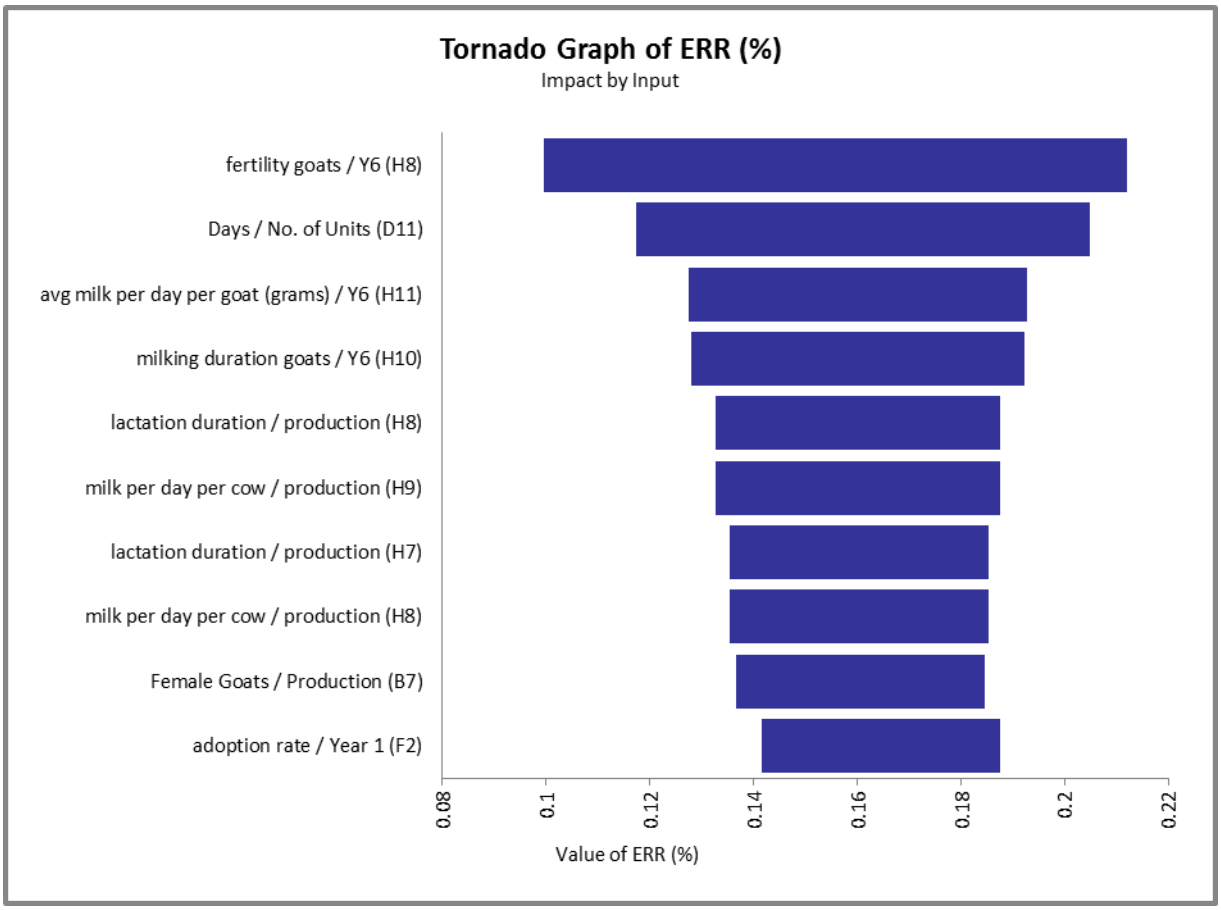
Sensitivity Analysis (variable by variable and "scenario" analysis) of EIRR

OCC=9%	Cash flow	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	ERR
	Costs + 5%	-21,18	-4,45	-5,91	-7,88	2,42	5,88	12,07	13,64	19,15	14,98	6,23	13,01	16,61	17,27	17,79	16,3%
	Costs + 10%	-21,31	-4,57	-6,02	-7,97	2,33	5,80	12,05	13,62	19,13	14,96	6,21	13,00	16,59	17,25	17,77	16,1%
	Costs + 20%	-21,57	-4,80	-6,22	-8,15	2,15	5,64	12,02	13,59	19,10	14,93	6,18	12,96	16,56	17,22	17,74	15,7%
	Costs + 30%	-21,84	-5,03	-6,43	-8,33	1,97	5,48	11,99	13,56	19,07	14,90	6,15	12,93	16,53	17,19	17,71	15,3%
	Costs + 60%	-22,62	-5,72	-7,05	-8,87	1,43	4,99	11,89	13,46	18,97	14,80	6,05	12,83	16,43	17,09	17,61	14,1%
	Costs + 90%	-23,41	-6,42	-7,67	-9,40	0,89	4,50	11,79	13,36	18,87	14,70	5,96	12,74	16,33	16,99	17,51	13,1%
	Costs + 99%	-23,65	-6,63	-7,85	-9,57	0,73	4,36	11,76	13,33	18,84	14,68	5,93	12,71	16,30	16,96	17,48	12,8%
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Benefits - 5%	-20,13	-4,23	-5,62	-7,49	2,29	5,58	11,46	12,96	18,19	14,23	5,92	12,36	15,78	16,40	16,90	16,3%
	Benefits -10%	-19,21	-4,13	-5,43	-7,19	2,08	5,20	10,84	12,26	17,22	13,46	5,59	11,69	14,93	15,52	15,99	16,1%
	Benefits - 20%	-17,36	-3,93	-5,06	-6,59	1,65	4,45	9,60	10,86	15,27	11,93	4,93	10,36	13,23	13,76	14,18	15,5%
	Benefits - 60%	-10,00	-3,12	-3,56	-4,19	-0,08	1,41	4,64	5,27	7,47	5,80	2,30	5,02	6,46	6,72	6,93	11,1%
	Benefits - 65%	-8,30	-2,94	-3,22	-3,64	-0,47	0,72	3,50	3,98	5,68	4,39	1,70	3,79	4,90	5,10	5,26	8,9%
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Costs + 5% Benefits - 5%	-20,26	-4,35	-5,72	-7,58	2,20	5,50	11,45	12,94	18,17	14,21	5,90	12,34	15,76	16,39	16,88	16,1%
	Costs + 10% Benefits - 5%	-20,39	-4,47	-5,83	-7,67	2,11	5,42	11,43	12,92	18,16	14,20	5,89	12,33	15,74	16,37	16,87	15,9%
	Costs + 20% Benefits - 5%	-20,65	-4,70	-6,03	-7,85	1,93	5,26	11,40	12,89	18,12	14,16	5,85	12,30	15,71	16,34	16,83	15,4%
	Costs + 30% Benefits -10%	-21,70	-5,62	-6,86	-8,57	1,21	4,61	11,27	12,76	18,00	14,04	5,72	12,17	15,58	16,21	16,70	13,8%
	costs + 60% & Benedit -59	-22,49	-6,32	-7,48	-9,10	0,67	4,13	11,17	12,66	17,90	13,94	5,63	12,07	15,48	16,11	16,61	12,7%

Sensitivity Analysis of EIRR

Costs + 30%	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	ERR
Costs + 5% Benefits -10%	- 19,34	- 4,25	- 5,54	- 7,28	1,99	5,12	10,83	12,24	17,20	13,45	5,57	11,68	14,91	15,51	15,98	**15,8%**
Costs + 10% Benefits -10%	- 19,47	- 4,36	- 5,64	- 7,37	1,90	5,04	10,81	12,22	17,18	13,43	5,56	11,66	14,90	15,49	15,96	**15,6%**
Costs + 20% Benefits -10%	- 19,73	- 4,60	- 5,85	- 7,55	1,72	4,88	10,78	12,19	17,15	13,40	5,53	11,63	14,86	15,46	15,93	**15,2%**
costs + 30% & Benedit -5%	- 20,78	- 4,83	- 6,05	- 7,73	1,54	4,72	10,75	12,16	17,12	13,37	5,49	11,60	14,83	15,43	15,89	**14,4%**
costs + 90% & Benedit -10%	- 21,57	- 6,22	- 7,29	- 8,80	0,46	3,75	10,55	11,97	16,92	13,17	5,30	11,40	14,64	15,23	15,70	**12,3%**
Costs + 5% Benefits - 20%	- 17,50	- 4,05	- 5,16	- 6,68	1,56	4,36	9,59	10,84	15,25	11,92	4,92	10,34	13,22	13,75	14,16	**15,2%**
Costs + 10% Benefits - 20%	- 17,63	- 4,16	- 5,27	- 6,77	1,47	4,28	9,57	10,83	15,23	11,90	4,90	10,33	13,20	13,73	14,15	**15,0%**
Costs + 20% Benefits - 20%	- 17,89	- 4,39	- 5,47	- 6,95	1,29	4,12	9,54	10,79	15,20	11,87	4,87	10,29	13,17	13,70	14,11	**14,5%**
costs + 60% & Benedit -20%	- 18,94	- 5,32	- 6,30	- 7,67	0,57	3,47	9,41	10,66	15,07	11,74	4,74	10,16	13,04	13,57	13,98	**12,7%**
costs + 90% & Benedit -20%	- 19,96	- 6,22	- 7,10	- 8,37	- 0,13	2,84	9,28	10,54	14,95	11,61	4,61	10,04	12,91	13,44	13,86	**11,1%**
costs + 99% & Benedit -20%	- 19,96	- 6,22	- 7,10	- 8,37	- 0,13	2,84	9,28	10,54	14,95	11,61	4,61	10,04	12,91	13,44	13,86	**11,1%**

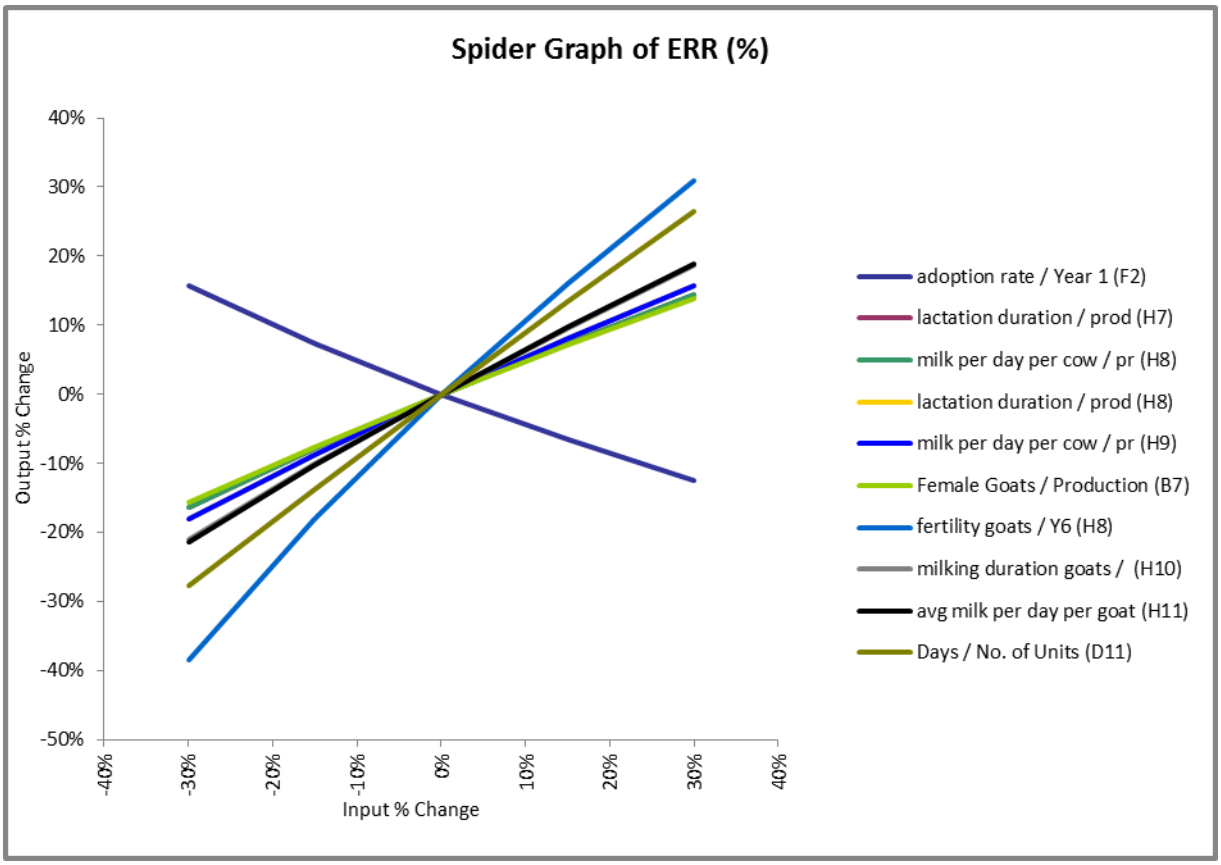
Annex 2: Specific Sensitivity Analysis



1.What-If Analysis Summary for Output EIRR (%)

Top 10 Inputs Ranked By Change in Actual Value

				Minimum			Maximum		
				Output		Input	Output		Input
Rank	Input Name	Worksheet	Cell	Value	Change (%)	Value	Value	Change (%)	Value
1	fertility goats / Y6 (H8)	M5	H8	9,96%	-38,54%	1,05	21,20%	30,83%	1,95
2	Days / No. of Units (D11)	M10	D11	11,72%	-27,65%	210	20,48%	26,42%	390
3	avg milk per day per goat (grams) / Y6 (H11)	M5	H11	12,74%	-21,38%	700	19,26%	18,89%	1300
4	milking duration goats / Y6 (H10)	M5	H10	12,79%	-21,04%	126	19,22%	18,62%	234
5	lactation duration / production (H8)	M3	H8	13,27%	-18,13%	210	18,75%	15,72%	390
6	milk per day per cow / production (H9)	M3	H9	13,27%	-18,13%	14	18,75%	15,72%	26
7	lactation duration / production (H7)	M2	H7	13,54%	-16,43%	210	18,53%	14,38%	390
8	milk per day per cow / production (H8)	M2	H8	13,54%	-16,43%	15,4	18,53%	14,38%	28,6
9	Female Goats / Production (B7)	M5	B7	13,66%	-15,71%	35	18,45%	13,85%	65
10	adoption rate / Year 1 (F2)	Lvstk number	F2	14,17%	-12,57%	0,065	18,74%	15,68%	0,035



What-If Analysis Summary for Output EIRR (%)

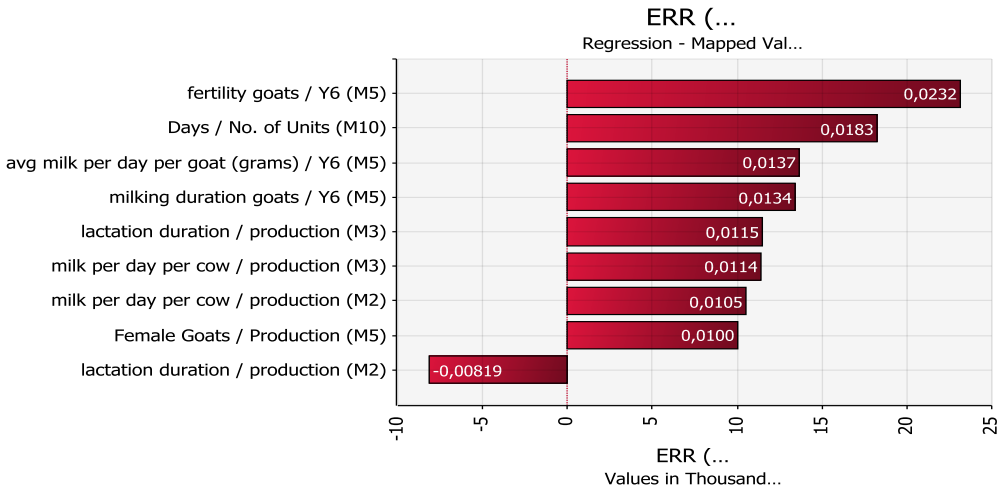
Top 10 Inputs Percent Change vs. Output Percent Change

				Input Variation			Output Variation		
Input Name	**Worksheet**	**Cell**	**Step**	**Value**	**Change**	**Change (%)**	**Value**	**Change**	**Change (%)**
adoption rate / Year 1 (F2)	lvstk Number	F2	1	0,035	-0,015	-30,00%	18,74%	2,54%	15,68%
			2	0,0425	-0,0075	-15,00%	17,40%	1,19%	7,36%
			3	0,05	0	0,00%	16,20%	0,00%	0,00%
			4	0,0575	0,0075	15,00%	15,13%	-1,07%	-6,60%
			5	0,065	0,015	30,00%	14,17%	-2,04%	-12,57%
lactation duration / production (H7)	M2	H7	1	210	-90	-30,00%	13,54%	-2,66%	-16,43%
			2	255	-45	-15,00%	14,92%	-1,28%	-7,92%
			3	300	0	0,00%	16,20%	0,00%	0,00%
			4	345	45	15,00%	17,40%	1,20%	7,41%
			5	390	90	30,00%	18,53%	2,33%	14,38%
milk per day per cow / production (H8)	M2	H8	1	15,4	-6,6	-30,00%	13,54%	-2,66%	-16,43%
			2	18,7	-3,3	-15,00%	14,92%	-1,28%	-7,92%
			3	22	0	0,00%	16,20%	0,00%	0,00%
			4	25,3	3,3	15,00%	17,40%	1,20%	7,41%
			5	28,6	6,6	30,00%	18,53%	2,33%	14,38%
lactation duration / production (H8)	M3	H8	1	210	-90	-30,00%	13,27%	-2,94%	-18,13%
			2	255	-45	-15,00%	14,79%	-1,41%	-8,71%
			3	300	0	0,00%	16,20%	0,00%	0,00%
			4	345	45	15,00%	17,52%	1,31%	8,11%
			5	390	90	30,00%	18,75%	2,55%	15,72%
milk per day per cow / production (H9)	M3	H9	1	14	-6	-30,00%	13,27%	-2,94%	-18,13%
			2	17	-3	-15,00%	14,79%	-1,41%	-8,71%
			3	20	0	0,00%	16,20%	0,00%	0,00%
			4	23	3	15,00%	17,52%	1,31%	8,11%
			5	26	6	30,00%	18,75%	2,55%	15,72%
Female Goats / Production (B7)	M5	B7	1	35	-15	-30,00%	13,66%	-2,54%	-15,71%
			2	42,5	-7,5	-15,00%	14,97%	-1,23%	-7,59%
			3	50	0	0,00%	16,20%	0,00%	0,00%
			4	57,5	7,5	15,00%	17,36%	1,15%	7,13%
			5	65	15	30,00%	18,45%	2,24%	13,85%
fertility goats / Y6 (H8)	M5	H8	1	1,05	-0,45	-30,00%	9,96%	-6,25%	-38,54%
			2	1,275	-0,225	-15,00%	13,29%	-2,92%	-18,00%
			3	1,5	0	0,00%	16,20%	0,00%	0,00%
			4	1,725	0,225	15,00%	18,82%	2,61%	16,13%
			5	1,95	0,45	30,00%	21,20%	5,00%	30,83%

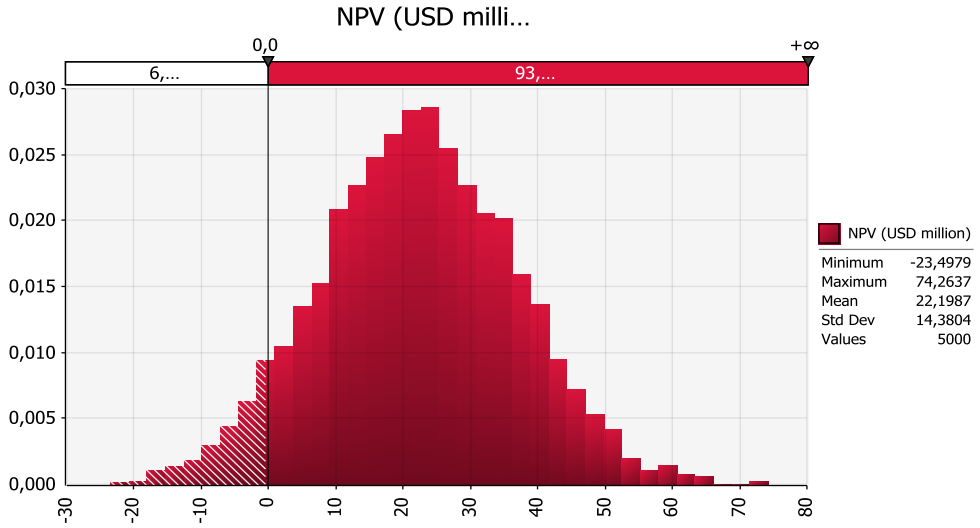
				Input Variation			**Output Variation**		
Input Name	Worksheet	Cell	Step	Value	Change	Change (%)	Value	Change	Change (%)
milking duration goats / Y6 (H10)	M5	H10	1	126	-54	-30,00%	12,79%	-3,41%	-21,04%
			2	153	-27	-15,00%	14,56%	-1,65%	-10,17%
			3	180	0	0,00%	16,20%	0,00%	0,00%
			4	207	27	15,00%	17,75%	1,55%	9,57%
			5	234	54	30,00%	19,22%	3,02%	18,62%
avg milk per day per goat (grams) / Y6 (H11)	M5	H11	1	700	-300	-30,00%	12,74%	-3,46%	-21,38%
			2	850	-150	-15,00%	14,53%	-1,67%	-10,32%
			3	1000	0	0,00%	16,20%	0,00%	0,00%
			4	1150	150	15,00%	17,78%	1,57%	9,71%
			5	1300	300	30,00%	19,26%	3,06%	18,89%
Days / No. of Units (D11)	M10	D11	1	210	-90	-30,00%	11,72%	-4,48%	-27,65%
			2	255	-45	-15,00%	13,98%	-2,22%	-13,70%
			3	300	0	0,00%	16,20%	0,00%	0,00%
			4	345	45	15,00%	18,37%	2,17%	13,39%
			5	390	90	30,00%	20,48%	4,28%	26,42%

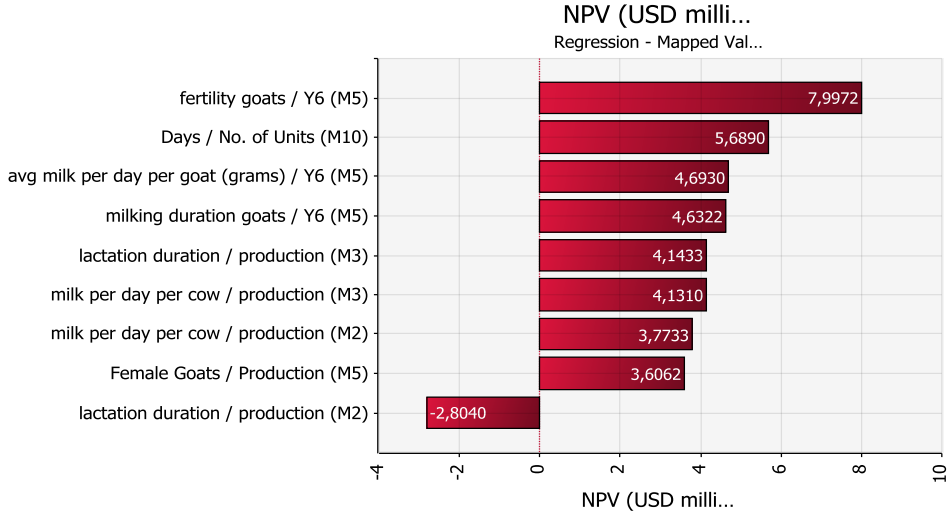
Annex 3: Risk Analysis (EIRR and ENPV)

EIRR



NPV





Annex 4: Economic analysis models

Annex 4

1. Model 1. 4 adult cows sell to hallab (1/2)

Model 1.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Production														
fertility	0,83	0,83	0,84	0,86	0,88	0,90	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
lactation duration	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
milk per day per cow	15	16	17	18	19	20	20	20	20	20	20	20	20	20	20	20
milk per year per cow	3 750	3 800	4 000	4 500	5 000	5 200	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500
calf born per year	0,83	0,83	0,84	0,86	0,88	0,90	0,92	1	1	1	1	1	1	1	1	1
milk consumed by calf	250	252	255	260	265	270	275	275	275	275	275	275	275	275	275	275
milk consumed by family per year	547,5	547,5	547,5	547,5	547,5	547,5	547,5	548	548	548	548	548	548	548	548	548
post harvest losses	5%	5%	4%	3,50%	3%	2,80%	2,50%	0	0	0	0	0	0	0	0	0
milk sold per year	3 065	3 111	3 332	3 827	4 327	4 526	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827
price/liter	712	726	741	756	771	786	802	818	834	851	868	885	903	921	939	958
income milk per cow	2 182 236	2 258 997	2 468 525	2 891 931	3 335 101	3 557 815	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798	3 870 798
mortality calves	5,00%	5%	4%	3,50%	3%	2,80%	2,50%	3%	3%	3%	3%	3%	3%	3%	3%	3%
nb calves sold per cow	0,40	0,39	0,40	0,41	0,42	0,44	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45
price per calf	267 000	272 340	277 787	283 343	289 009	294 790	300 685	306 699	312 833	319 090	325 472	331 981	338 621	345 393	352 301	359 347
gross income calf	105 688	107 370	112 004	117 573	122 648	128 941	134 369	134 369	134 369	134 369	134 369	134 369	134 369	134 369	134 369	134 369
culling age	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
nb of cows culled per year	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
price of culled cows	267 000	272 340	277 787	283 343	289 009	294 790	300 685	306 699	312 833	319 090	325 472	331 981	338 621	345 393	352 301	359 347
gross income cows	66 750	68 085	69 447	70 836	72 252	73 697	75 171	75 171	75 171	75 171	75 171	75 171	75 171	75 171	75 171	75 171
quantity manure produced	1 825	1 843	1 862	1 880	1 899	1 918	1 937	1 957	1 976	1 996	2 016	2 036	2 056	2 077	2 098	2 119
price manure	66,8	67,4	68,1	68,8	69,5	70,2	70,9	71,6	72,3	73,0	73,7	74,5	75,2	76,0	76,7	77,5
income manure	121 819	124 267	126 765	129 313	131 912	134 564	137 268									
Total gross income per cow	2 476 492	2 558 719	2 776 740	3 209 653	3 661 914	3 895 017	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606	4 217 606

Model 1. 4 adult cows sell to hallab (2/2)

Model 1.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Costs														
price per Cows		35 600 000	-	-	-	-	-		0	0	0		0	0	0	0
milking machine		667 500	-	-	-	-	-		0	0	0	667 500	0	0	0	0
O&M milking machine		5 941	5 340	5 394	5 447	5 502	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557
small equipement		667 500	-	-	-	-	-		0	0	0	667 500	0	0	0	0
vehicle	0	0	0	0	0	0	0		0	0	0		0	0	0	0
processing equipement	0	0	0	0	0	0	0		0	0	0		0	0	0	0
fodder cost per day per cow	2 003	2 023	2 043	2 063	2 084	2 105	2 126	2 147	2 168	2 190	2 212	2 234	2 256	2 279	2 302	2 325
concentrate cost per day per cow	4 806	4 854	4 903	4 952	5 001	5 051	5 102	5 153	5 204	5 256	5 309	5 362	5 416	5 470	5 524	5 580
total feeding cost per day per cow	6 060	6 120	6 181	6 243	6 306	6 369	6 432	6 497	6 562	6 627	6 694	6 760	6 828	6 896	6 965	7 035
feeding cost per liter	404	383	364	347	332	318	322	325	328	331	335	338	341	345	348	352
feeding cost per cow per year	2 211 741	2 233 859	2 256 197	2 278 759	2 301 547	2 324 562	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808	2 347 808
AI & reproduction cost per year	17 800	21 508	25 217	28 925	32 633	36 342	40 050	40 451	40 855	41 264	41 676	42 093	42 514	42 939	43 368	43 802
Vet costs per year	66 750	69 717	72 683	75 650	78 617	81 583	84 550	85 396	86 249	87 112	87 983	88 863	89 752	90 649	91 556	92 471
family labour cost per cow	750 000	765 000	780 300	795 906	811 824	828 061	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622
hired labour cost per cow	562 500	573 750	585 225	596 930	608 868	621 045	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466
Labour costs per cow	1 312 500	1 338 750	1 365 525	1 392 836	1 420 692	1 449 106	1 478 088	1 500 000	1 500 000	1 500 000	1 500 000	1 500 000	1 500 000	1 500 000	1 500 000	1 500 000
Total production cost per cow	3 608 791	40 604 774	3 724 962	3 781 563	3 838 936	3 897 095	3 956 053	3 979 211	3 980 469	3 981 740	3 983 024	5 319 321	3 985 630	3 986 953	3 988 289	3 989 638
Net income per cow per year	- 1 132 299	- 38 046 055	- 948 222	- 571 911	- 177 023	- 2 078	261 553	261 553	261 553	261 553	261 553	261 553	261 553	261 553	261 553	261 553
Net income per farm per year	- 4 529 198	- 152 184 221	- 3 792 889	- 2 287 643	- 708 091	- 8 311	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214	1 046 214
Income with self consumption	- 4 139 378	- 151 786 605	- 3 387 321	- 1 873 963	- 286 137	422 081	1 485 214	1 493 994	1 502 950	1 512 085	1 521 402	1 530 906	1 540 600	1 550 487	1 560 573	1 570 860
								-	-	-	-	-	-	-	-	-
Add net income		- 147 655 023	736 309	2 241 555	3 821 107	4 520 887	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411	5 575 411
Add net income in USD	1500	- 98 437	491	1 494	2 547	3 014	3 717	3 717	3 717	3 717	3 717	3 717	3 717	3 717	3 717	3 717
Number of cows		36	72	144	216	288	360	432	504	576	576	576	576	576	576	576
	IRR	24,7%														
	NPV	5,92														

2. Model 2. 7 adult cows without processing sell to hallab (1/2)

Model 2.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		production														
fertility	0,83	0,83	0,84	0,86	1,00	0,90	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
lactation duration	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
milk per day per cow	17	17	18	19	20	21	22	22	22	22	22	22	22	22	22	22
milk per year per cow	4 250	4 250	4 400	4 900	5 400	5 900	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050
calf born per year	0,83	0,83	0,84	0,86	1,00	0,90	0,92	1	1	1	1	1	1	1	1	1
milk consumed by calf	250	252	255	260	265	270	275	275	275	275	275	275	275	275	275	275
milk consumed by family per year	547,5	547,5	547,5	547,5	547,5	547,5	547,5	548	548	548	548	548	548	548	548	548
post harvest losses	5%	5%	4%	3,50%	3%	2,80%	2,50%	0	0	0	0	0	0	0	0	0
milk sold per year	3 696	3 694	3 874	4 372	4 875	5 366	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524
price/liter	712	712	719	726	734	741	748	756	763	771	779	786	794	802	810	818
gross income milk	2 631 534	2 630 181	2 785 928	3 175 384	3 575 980	3 975 669	4 133 612	4 174 948	4 216 698	4 258 865	4 301 453	4 344 468	4 387 913	4 431 792	4 476 110	4 520 871
mortality calves	5,00%	5%	4%	3,50%	3%	2,80%	2,50%	3%	3%	3%	3%	3%	3%	3%	3%	3%
nb calves sold per cow	0,40	0,39	0,40	0,41	0,49	0,44	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45
price per calf	267 000	267 000	269 670	272 367	275 090	277 841	280 620	283 426	286 260	289 123	292 014	294 934	297 883	300 862	303 871	306 910
gross income calf	105 688	105 265	108 731	113 019	133 419	121 528	125 402	126 656	127 922	129 202	130 494	131 799	133 117	134 448	135 792	137 150
culling age	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
nb of cows culled per year	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
price of culled cows	1 068 000	1 078 680	1 089 467	1 100 361	1 111 365	1 122 479	1 133 704	1 145 041	1 156 491	1 168 056	1 179 736	1 191 534	1 203 449	1 215 484	1 227 638	1 239 915
gross income cows	267 000	269 670	272 367	275 090	277 841	280 620	283 426	286 260	289 123	292 014	294 934	297 883	300 862	303 871	306 910	309 979
quantity manure produced	1 825	1 843	1 862	1 880	1 899	1 918	1 937	1 957	1 976	1 996	2 016	2 036	2 056	2 077	2 098	2 119
price manure	66,8	67,4	68,1	68,8	69,5	70,2	70,9	71,6	72,3	73,0	73,7	74,5	75,2	76,0	76,7	77,5
income manure	121 819	124 267	126 765	129 313	131 912	134 564	137 268									
Total gross income per cow	4 194 040	4 208 063	4 383 258	4 793 167	5 230 518	5 634 858	5 813 412	5 732 905	5 790 234	5 848 136	5 906 618	5 965 684	6 025 341	6 085 594	6 146 450	6 207 914

Model 2. 7 adult cows without processing sell to hallab (2/2)

Model 2.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Costs														
price per cow		35 600 000	-	-	-	-	-		0	0	0		0	0	0	0
milking machine		756 500	-	-	-	-	-		0	0	0	756 500	0	0	0	0
O&M milking machine		6 733	6 800	6 868	6 937	7 006	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076
small equipement		667 500	-	-	-	-	-		0	0	0	667 500	0	0	0	0
vehicle	0	0	0	0	0	0	0		0	0	0		0	0	0	0
processing equipement	0	0	0	0	0	0	0		0	0	0		0	0	0	0
fodder cost per day per cow	2 250	2 273	2 295	2 318	2 341	2 365	2 388	2 412	2 436	2 461	2 485	2 510	2 535	2 561	2 586	2 612
concentrate cost per day per 5 cow	6 300	6 818	6 886	6 955	7 024	7 094	7 165	7 237	7 309	7 382	7 456	7 531	7 606	7 682	7 759	7 837
total feeding cost per day per 5 cow	7 610	8 090	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
feeding cost per liter	448	476	454	434	417	401	386	386	386	386	386	386	386	386	386	386
feeding cost per 5 cow per year	2 777 468	2 952 887	2 982 415	3 012 240	3 042 362	3 072 786	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513
AI & reproduction cost per year	17 800	17 978	18 158	18 339	18 523	18 708	18 895	19 084	19 275	19 468	19 662	19 859	20 057	20 258	20 461	20 665
Vet costs per year	66 750	67 418	68 092	68 773	69 460	70 155	70 856	71 565	72 281	73 003	73 734	74 471	75 216	75 968	76 727	77 495
family labour cost per cow	428 571	432 857	441 514	450 345	459 351	468 538	477 909	428 571	428 571	428 571	428 571	428 571	428 571	428 571	428 571	428 571
hired labour cost per cow	642 857	655 714	668 829	682 205	695 849	709 766	723 962	738 441	753 210	768 274	783 639	799 312	815 298	831 604	848 236	865 201
Labour costs per cow	1 071 429	1 088 571	1 110 343	1 132 550	1 155 201	1 178 305	1 201 871	1 167 012	1 181 781	1 196 845	1 212 211	1 227 883	1 243 870	1 260 176	1 276 808	1 500 000
Total production cost per cow	3 933 446	39 726 853	5 609 741	4 238 701	4 292 414	4 346 890	4 402 142	4 368 251	4 383 926	4 399 906	4 416 196	4 432 803	5 873 732	4 466 991	4 484 586	4 708 750
Net income per cow per year	260 594	- 35 518 790	- 1 226 483	554 466	938 104	1 287 968	1 411 270	1 364 654	1 406 308	1 448 230	1 490 421	1 532 881	151 608	1 618 603	1 661 864	1 499 165
Net income per farm per year	1 824 161	- 248 631 530	- 8 585 378	3 881 259	6 566 728	9 015 779	9 878 889	9 552 578	9 844 154	10 137 612	10 432 950	10 730 166	1 061 257	11 330 220	11 633 051	10 494 154
Income with self consumption	2213980,65	-248241709,8	-8191659,957	4278914,823	6968359,472	9421426,958	10288594,01	9 966 379	10 262 094	10 559 731	10 859 291	11 160 770	1 496 167	11 769 479	12 076 703	10 942 242
Add net income without Home Cons		- 250 455 690	- 10 409 539	2 057 099	4 742 567	7 191 618	8 054 729	7 728 417	8 019 993	8 313 451	8 608 789	8 906 006	- 762 903	9 506 060	9 808 891	8 669 994
Add net income in USD	1500	- 166 970	- 6 940	1 371	3 162	4 794	5 370	5 152	5 347	5 542	5739,192994	5937,337014	-508,6022557	6337,373057	6539,260512	5779,995692
Number of cows		24,00	48	96	144	192	240	288	336	384	384	384	384	384	384	384
Value $ Model 2		- 4 007 291	- 333 105	131 654	455 286	920 527	1 288 757	1 483 856	1 796 478	2 128 244	2 203 850	2 279 937	- 195 303	2 433 551	2 511 076	2 219 518
		0														
Mdl 2																
Employment		24	48	96	144	192	240	288	336	384	384	384	384	384	384	384
Self-employment	2	48	96	192	288	384	480	576	672	768	768	768	768	768	768	768
total Mdl 2		72	144	288	432	576	720	864	1 008	1 152	1 152	1 152	1 152	1 152	1 152	1 152

3. Model 3. 4 adult cows without processing direct sales(1/2)

Model 3.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
			Production													
fertility	0,83	0,83	0,84	0,86	0,88	0,90	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
lactation duration	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
milk per day per cow	15	16	17	18	19	20	20	20	20	20	20	20	20	20	20	20
milk per year per cow	3 750	3 800	4 000	4 500	5 000	5 200	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500	5 500
calf born per year	0,83	0,83	0,84	0,86	0,88	0,90	0,92	1	1	1	1	1	1	1	1	1
milk consumed by calf	250	252	255	260	265	270	275	275	275	275	275	275	275	275	275	275
milk consumed by family per year	547,5	547,5	547,5	547,5	547,5	547,5	547,5	548	548	548	548	548	548	548	548	548
post harvest losses	5%	5%	4%	3,50%	3%	2,80%	2,50%	0	0	0	0	0	0	0	0	0
milk sold per year	3 065	3 111	3 332	3 827	4 327	4 526	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827	4 827
price/liter	720	712	719	726	734	741	748	756	763	771	779	786	794	802	810	818
gross income milk	2 206 755	2 214 703	2 396 395	2 779 906	3 174 479	3 353 266	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487	3 612 487
mortality calves	5,00%	5%	4%	3,50%	3%	2,80%	2,50%	3%	3%	3%	3%	3%	3%	3%	3%	3%
nb calves sold per cow	0,40	0,39	0,40	0,41	0,42	0,44	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45
price per calf	267 000	267 000	269 670	272 367	275 090	277 841	280 620	283 426	286 260	289 123	292 014	294 934	297 883	300 862	303 871	306 910
gross income calf	105 688	105 265	108 731	113 019	116 741	121 528	125 402	125 402	125 402	125 402	125 402	125 402	125 402	125 402	125 402	125 402
culling age	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
nb of cows culled per year	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
price of culled cows	1 068 000	1 011 263	1 021 375	1 031 589	1 041 905	1 052 324	1 062 847	1 073 476	1 084 210	1 095 052	1 106 003	1 117 063	1 128 234	1 139 516	1 150 911	1 162 420
gross income cows	267 000	252 816	255 344	257 897	260 476	263 081	265 712									
quantity manure produced	1 825	1 825	1 825	1 825	1 825	1 825	1 825									
price manure	75,0	76,0	77,0	78,0	79,0	80,0	81,0	1 600,0	1 600,0	1 600,0	1 600,0	1 600,0	1 600,0	1 600,0	1 600,0	1 600,0
income manure	136 875	138 700	140 525	142 350	144 175	146 000	147 825									
Total gross income per cow	2 716 318	2 711 483	2 900 995	3 293 172	3 695 871	3 883 875	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426	4 151 426

Model 3. 4 adult cows without processing direct sales (2/2)

Model 3.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
			Costs													
price per Cows		35 600 000	-	-	-	-	-		0	0	0		0	0	0	0
milking machine		667 500	-	-	-	-	-		0	0	0	667 500	0	0	0	0
O&M milking machine		5 941	5 340	5 394	5 447	5 502	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557	5 557
small equipement		667 500	-	-	-	-	-		0	0	0	667 500	0	0	0	0
vehicle	0	0	0	0	0	0	0		0	0	0		0	0	0	0
processing equipement	0	0	0	0	0	0	0		0	0	0		0	0	0	0
fodder cost per day per cow	2 250	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273	2 273
concentrate cost per day per cow	5 400	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818	6 818
total feeding cost per day per cow	6 809	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090	8 090
feeding cost per liter	454	506	476	449	426	405	405	405	405	405	405	405	405	405	405	405
feeding cost per cow per year	2 485 103	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887	2 952 887
AI & reproduction cost per year	17 800	21 508	25 217	28 925	32 633	36 342	40 050	40 050	40 050	40 050	40 050	40 050	40 050	40 050	40 050	40 050
Vet costs per year	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750	66 750
family labour cost per cow	750 000	765 000	780 300	795 906	811 824	828 061	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622	844 622
hired labour cost per cow	562 500	573 750	585 225	596 930	608 868	621 045	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466	633 466
Labour costs per cow	1 312 500	1 338 750	1 365 525	1 392 836	1 420 692	1 449 106	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088	1 478 088
Total production cost per cow	3 882 153	41 320 836	4 415 718	4 446 791	4 478 410	4 510 586	4 543 332	4 543 332	4 543 332	4 543 332	4 543 332	5 878 332	4 543 332	4 543 332	4 543 332	4 543 332
Labour costs per year/cow	450 000	454 500	459 045	463 635	468 272	472 955	477 684	482 461	487 286	492 158	497 080	502 051	507 071	512 142	517 263	522 436
Net income per cow per year	- 1 165 835	- 38 609 353	- 1 514 723	- 1 153 619	- 782 538	- 626 711	- 391 906	- 391 906	- 391 906	- 391 906	- 391 906	- 1 726 906	- 391 906	- 391 906	- 391 906	- 391 906
Net income per farm per year	-4663340	-154437410	-6058892,374	-4614474,305	-3130152,829	-2506844,608	-1567622,495	- 1 567 622	- 1 567 622	- 1 567 622	- 1 567 622	- 6 907 622	- 1 567 622	- 1 567 622	- 1 567 622	- 1 567 622
Income with self consumption	-4269140	- 154 047 590	- 5 665 174	- 4 216 819	- 2 728 521	- 2 101 196	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918	- 1 157 918
								-	-	-	-	-	-	-	-	-
Add net income without Home Cons		- 149 774 070	- 1 395 552	48 866	1 533 187	2 156 495	3 095 718	3 095 718	3 095 718	3 095 718	3095717,505	-2244282,495	3095717,505	3095717,505	3095717,505	3095717,505
Add net income in USD	1500	-9984938,0%	-930,3682496	32,57713002	1022,124781	1437,663595	2063,81167	2063,81167	2063,81167	2063,81167	2063,81167	-1496,18833	2063,81167	2063,81167	2063,81167	2063,81167
Number of cows		48	96	192	288	384	480	576	672	768	768	768	768	768	768	768
Value in $ Mdl 3		- 4 792 770	- 89 315	6 255	294 372	552 063	990 630	1 188 756	1 386 881	1 585 007	1 585 007	- 1 149 073	1 585 007	1 585 007	1 585 007	1 585 007
		0														
Mdl 3																
Employment		48	96	192	288	384	480	576	672	768	768	768	768	768	768	768
Self-employment	2	96	192	384	576	768	960	1 152	1 344	1 536	1 536	1 536	1 536	1 536	1 536	1 536
total Mdl 3		144	288	576	864	1 152	1 440	1 728	2 016	2 304	2 304	2 304	2 304	2 304	2 304	2 304
total Mdl 4	-	36	72	144	216	288	360	432	504	576	576	576	576	576	576	576

4. Model 4. 7 adult cows without processing direct sales (1/2)

Model 4.	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
			Production													
fertility	0,83	0,83	0,84	0,86	0,88	0,90	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
lactation duration	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
milk per day per cow	17	17	18	19	20	21	22	22	22	22	22	22	22	22	22	22
milk per year per cow	4 250	4 250	4 400	4 900	5 400	5 900	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050	6 050
calf born per year	0,83	0,83	0,84	0,86	0,88	0,90	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
milk consumed by calf	250	252	255	260	265	270	275	275	275	275	275	275	275	275	275	275
milk consumed by family per year	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548
post harvest losses	0,05	0,05	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
milk sold per year	3 696	3 694	3 874	4 372	4 875	5 366	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524	5 524
price/liter	1 068	970	989	1 009	1 029	1 049	1 070	1 092	1 092	1 092	1 092	1 092	1 092	1 092	1 092	1 092
gross income milk	3 947 301	3 581 518	3 831 159	4 409 966	5 015 485	5 631 276	5 912 963	6 031 222	6 031 222	6 031 222	6 031 222	6 031 222	6 031 222	6 031 222	6 031 222	6 031 222
mortality calves	0,05	0,05	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
nb calves sold per cow	0,40	0,39	0,40	0,41	0,42	0,44	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45	0,45
price per calf	267 000	267 000	269 670	272 367	275 090	277 841	280 620	283 426	286 260	289 123	292 014	294 934	297 883	300 862	303 871	306 910
gross income calf	105 688	105 265	108 731	113 019	116 741	121 528	125 402	126 656	127 922	129 202	130 494	131 799	133 117	134 448	135 792	137 150
culling age	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00
nb of cows culled per year	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
price of culled cows	1 068 000	1 078 680	1 089 467	1 100 361	1 111 365	1 122 479	1 133 704	1 145 041	1 156 491	1 168 056	1 179 736	1 191 534	1 203 449	1 215 484	1 227 638	1 239 915
gross income cows	267 000	269 670	272 367	275 090	277 841	280 620	283 426	286 260	289 123	292 014	294 934	297 883	300 862	303 871	306 910	309 979
quantity manure produced	1 825	1 825	1 825	1 825	1 825	1 825	1 825									
price manure	75	76	77	78	79	80	81	1 600	1 600	1 600	1 600	1 600	1 600	1 600	1 600	1 600
income manure	136 875	138 700	140 525	142 350	144 175	146 000	147 825									
Total gross income per cow	4 456 864	4 095 153	4 352 782	4 940 425	5 554 243	6 179 423	6 469 616	6 444 138	6 448 267	6 452 438	6 456 650	6 460 904	6 465 201	6 469 541	6 473 924	6 478 351

Model 4. 7 adult cows without processing direct sales (2/2)

Model 4.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Costs														
price per cow		35 600 000	-	-	-	-	-		-	-	-		-	-	-	-
milking machine		756 500	-	-	-	-	-		-	-	-	756 500	-	-	-	-
O&M milking machine		6 733	6 800	6 868	6 937	7 006	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076	7 076
small equipement		667 500	-	-	-	-	-		-	-	-	667 500	-	-	-	-
vehicle	-	-	-	-	-	-	-		-	-	-		-	-	-	-
processing equipement	-	-	-	-	-	-	-		-	-	-		-	-	-	-
fodder cost per day per cow	2 250	2 273	2 295	2 318	2 341	2 365	2 388	2 412	2 436	2 461	2 485	2 510	2 535	2 561	2 586	2 612
concentrate cost per day per 5 cow	6 300	6 818	6 886	6 955	7 024	7 094	7 165	7 237	7 309	7 382	7 456	7 531	7 606	7 682	7 759	7 837
total feeding cost per day per 5 cow	7 610	8 090	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
feeding cost per liter	448	476	454	434	417	401	386	386	386	386	386	386	386	386	386	386
feeding cost per cow per year	2 777 468	2 952 887	2 982 415	3 012 240	3 042 362	3 072 786	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513	3 103 513
AI & reproduction cost per year	20 000	24 167	28 333	32 500	36 667	40 833	45 000	45 000	45 000	45 000	45 000	45 000	45 000	45 000	45 000	45 000
Vet costs per year	75 000	78 500	82 000	85 500	89 000	92 500	96 000	96 000	96 000	96 000	96 000	96 000	96 000	96 000	96 000	96 000
family labour cost per cow	428 571	437 143	445 886	454 803	463 899	473 177	482 641	482 641	482 641	482 641	482 641	482 641	482 641	482 641	482 641	482 641
hired labour cost per cow	857 143	874 286	891 771	909 607	927 799	946 355	965 282	965 282	965 282	965 282	965 282	965 282	965 282	965 282	965 282	965 282
Labour costs per cow	1 285 714	1 311 429	1 337 657	1 364 410	1 391 698	1 419 532	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923	1 447 923
Labour costs per year/cow	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000	450 000
Total production cost per cow	4 158 182	41 397 715	4 437 206	4 501 518	4 566 664	4 632 658	4 699 513	4 699 513	4 699 513	4 699 513	4 699 513	6 123 513	4 699 513	4 699 513	4 699 513	4 699 513
								-	-	-	-	-	-	-	-	-
Net income per cow per year	298 682	- 37 302 562	- 84 424	438 907	987 579	1 546 766	1 770 103	1 744 625	1 748 755	1 752 925	1 757 137	337 391	1 765 688	1 770 028	1 774 411	1 778 838
Net income per farm per year	2 090 774	- 261 117 933	- 590 970	3 072 347	6 913 053	10 827 360	12 390 720	12 212 378	12 241 282	12 270 475	12 299 960	2 361 740	12 359 818	12 390 196	12 420 879	12 451 868
Income with self consumption	2 675 504	- 260 587 115	- 49 536	3 624 610	7 476 362	11 401 934	12 976 786	12 810 165	12 839 069	12 868 262	12 897 747	2 959 527	12 957 605	12 987 983	13 018 666	13 049 655
Add net income without Home Cons		- 263 208 707	- 2 681 744	981 573	4 822 279	8 736 586	10 299 946	10 121 604	10 150 508	10 179 701	10 209 186	270 966	10 269 044	10 299 422	10 330 104	10 361 094
Add net income in USD	1 500	- 175 472	- 1 788	654	3 215	5 824	6 867	6 748	6 767	6 786	6 806	181	6 846	6 866	6 887	6 907
Number of cows Mdl 4		12	24	48	72	96	120	144	168	192	192	192	192	192	192	192
value in USD Mdl 4		- 2 105 670	- 42 908	31 410	231 469	559 141	823 996	971 674	1 136 857	1 303 002	1 306 776	34 684	1 314 438	1 318 326	1 322 253	1 326 220
		0														
Mdl 4																
Employment		12	24	48	72	96	120	144	168	192	192	192	192	192	192	192
Self-employment	2	24	48	96	144	192	240	288	336	384	384	384	384	384	384	384
total Mdl 4		36	72	144	216	288	360	432	504	576	576	576	576	576	576	576

5. Model 5. Sedentary system – 50 adult female goats (Baladi) (1/2)

Model 5.	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Production														
Female Goats	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
fertility goats	1,3	1,3	1,4	1,4	1,4	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
prolificity goats	2	2	2	2	2	2	2									
milking duration goats	150	155	160	165	170	175	180	180	180	180	180	180	180	180	180	180
avg milk per day per goat (grams)	400	500	600	700	800	900	1000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000
milk per year per goat (kg)	60	80	100	120	140	160	180	180	180	180	180	180	180	180	180	180
kids born per year per goat	130%	133%	137%	140,00%	143%	146,67%	150,00%	2	2	2	2	2	2	2	2	2
milk consumed by family per year	225	233	240	248	255	263	270	270	270	270	270	270	270	270	270	270
post harvest losses	5%	5%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
milk sold per year	2 625	3 605	4 585	5 565	6 545	7 525	8 505	8 505	8 505	8 505	8 505	8 505	8 505	8 505	8 505	8 505
price/liter avg	712	719	726	734	741	748	756	763	771	779	786	794	802	810	818	827
gross income milk	0,00	2 592 427,60	3 330 136,85	4 082 341,05	4 849 256,31	5 631 101,65	6 428 098,96									
mortality kids	30%	27%	23%	20%	17%	13%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
nb kids sold per goat	91%	98%	105%	112%	119%	127%	135%	135%	135%	135%	135%	135%	135%	135%	135%	135%
Total number of kids sold	15	19	23	28	33	38	44	44	44	44	44	44	44	44	44	44
price per kid	178 000	179 780	181 578	183 394	185 228	187 080	188 951	190 840	192 748	194 676	196 623	198 589	200 575	202 581	204 606	206 652
gross income kids	2 702 633	3 449 113	4 266 742	5 159 473	6 131 374	7 186 635	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572	8 329 572
culling age	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
nb of goats culled per year	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
price of culled goat	89 000	89 890	90 789	91 697	92 614	93 540	94 475	95 420	96 374	97 338	98 311	99 294	100 287	101 290	102 303	103 326
gross income goats	1 483 333	1 498 167	1 513 148	1 528 280	1 543 563	1 558 998	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588	1 574 588
kg manure produced (DM)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
price manure/kg	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
gross income manure	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750	273 750
Total gross income	4 459 717	7 813 457	9 383 777	11 043 844	12 797 943	14 650 485	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009	16 606 009

Model 5. Sedentary system – 50 adult female goats (Baladi) (2/2)

Model 5.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
		Costs														
price of 50 adult goats		25 810 000							-	-	-		-	-	-	-
milking machine		801 000	-	-	-	-	-		-	-	-	801 000	-	-	-	-
O&M milking machine		7 129	7 200	7 272	7 345	7 418	7 493	7 493	7 493	7 493	7 493	7 493	7 493	7 493	7 493	7 493
small equipement		801 000	-	-	-	-	-		-	-	-	801 000	-	-	-	-
vehicle	-	-	-	-	-	-	-		-	-	-		-	-	-	-
processing equipement	-	-	-	-	-	-	-		-	-	-		-	-	-	-
fodder cost per day per goat	490	499	509	519	530	540	551	562	574	585	597	609	621	633	646	659
concentrate cost per day per goat	445	454	463	472	482	491	501	511	521	532	542	553	564	576	587	599
total feeding cost per year per goat	303 572	309 644	315 837	322 153	328 596	335 168	341 872	348 709	355 683	362 797	370 053	377 454	385 003	392 703	400 557	408 568
Total feeding cost per year	15 178 616	15 497 778	15 816 940	16 136 102	16 455 264	16 774 425	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587	17 093 587
Vet costs per year	445 000	579 167	713 333	847 500	981 667	1 115 833	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000	1 250 000
family labour cost per cow	400 000	404 000	416 160	424 483	432 973	441 632	450 465	450 465	450 465	450 465	450 465	450 465	450 465	450 465	450 465	450 465
hired labour cost per cow	112 500	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974	985 974
Labour costs per cow	550 000	1 393 974	1 402 134	1 410 457	1 418 947	1 427 606	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439	1 436 439
Total production cost	16 173 616	44 890 048	17 939 607	18 401 331	18 863 222	19 325 283	19 787 519	19 787 519	19 787 519	19 787 519	19 787 519	21 389 519	19 787 519	19 787 519	19 787 519	19 787 519
Net income per farm per year	- 11 713 900	- 37 076 591	- 8 555 830	- 7 357 488	- 6 065 279	- 4 674 798	- 3 181 510	- 3 181 510	- 3 181 510	- 3 181 510	- 3 181 510	- 4 783 510	- 3 181 510	- 3 181 510	- 3 181 510	- 3 181 510
Income with self consumption	- 11 553 700	- 36 909 395	- 8 381 516	- 7 175 928	- 5 876 347	- 4 478 364	- 2 977 443	- 2 975 403	- 2 973 341	- 2 971 260	- 2 969 157	- 4 569 034	- 2 964 889	- 2 962 723	- 2 960 535	- 2 958 325
Add net income	-	- 62 272 087	- 5 223 446	- 2 819 516	- 227 727	2 560 737	5 554 947	5 556 987	5 559 048	5 561 130	5 563 232	2 361 356	5 567 501	5 569 667	5 571 855	5 574 065
Add net income in USD	1 500	- 41 515	- 3 482	- 1 880	- 152	1 707	3 703	3 705	3 706	3 707	3 709	1 574	3 712	3 713	3 715	3 716
Number of Goat		56	112	224	336	448	560	672	784	896	896	896	896	896	896	896
value in USD Mdl 5_Goat		- 2 324 825	- 390 017	- 421 048	- 51 011	764 807	2 073 847	2 489 530	2 905 529	3 321 848	3 323 104	1 410 517	3 325 654	3 326 948	3 328 255	3 329 575
Model 5																
Employment		56	112	224	336	448	560	672	784	896	896	896	896	896	896	896
Self-employment	2	112	224	448	672	896	1120	1344	1568	1792	1792	1792	1792	1792	1792	1792
total Mdl 5		168	336	672	1008	1344	1680	2016	2352	2688	2688	2688	2688	2688	2688	2688

6. Model 6. Semi-nomadic farming – 120 female sheep (Awassi) (1/2)

Model 6.	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
			production													
Female sheep	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
fertility sheep	75%	76%	77%	78%	78%	79%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
prolificity sheep	1,5	1,5	1,5	1,5	1,5	1,5	1,5									
milking duration sheep	120	117	113	110	107	103	100	100	100	100	100	100	100	100	100	100
avg milk per day per sheep (grams)	1 200	1 133	1 067	1 000	933	867	800	800	800	800	800	800	800	800	800	800
milk per year per sheep (kg)	144	133	123	112	101	91	80	80	80	80	80	80	80	80	80	80
lambs born per year	75%	76%	77%	78%	78%	79%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
milk consumed by family per year	120	117	113	110	107	103	100	100	100	100	100	100	100	100	100	100
post harvest losses	5%	5%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
milk sold per year	16 296	15 123	13 951	12 778	11 605	10 433	9 260	9 260	9 260	9 260	9 260	9 260	9 260	9 260	9 260	9 260
price/liter avg	712	726	741	756	771	786	802	818	834	851	868	885	903	921	939	958
gross income milk	11 602 752	10 983 170	10 334 163	9 654 802	8 944 134	8 201 177	7 424 924	7 573 422	7 724 891	7 879 389	8 036 976	8 197 716	8 361 670	8 528 904	8 699 482	8 873 471
mortality lambs	25%	23%	20%	18%	15%	13%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
nb lambs sold per sheep	56%	59%	61%	64%	67%	69%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%
Total number of lambs sold	21	25	29	33	38	43	48	48	48	48	48	48	48	48	48	48
price per lamb	178 000	179 780	181 578	183 394	185 228	187 080	188 951	190 840	192 748	194 676	196 623	198 589	200 575	202 581	204 606	206 652
gross income lambs	3 671 250	4 432 813	5 243 967	6 106 662	7 022 901	7 994 738	9 024 280	9 114 523	9 205 668	9 297 725	9 390 702	9 484 609	9 579 455	9 675 250	9 772 002	9 869 722
culling age	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
nb of sheep culled per year	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
price of culled sheep	89 000	89 890	90 789	91 697	92 614	93 540	94 475	95 420	96 374	97 338	98 311	99 294	100 287	101 290	102 303	103 326
gross income sheep	2 670 000	2 696 700	2 723 667	2 750 904	2 778 413	2 806 197	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259	2 834 259
kg manure produced (DM)	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
price manure/kg	75	77	77	75	75	75	75	75	75	75	75	75	75	75	75	75
gross income manure	219 000	223 380	223 380	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000	219 000
Total gross income	18 163 002	18 336 063	18 525 177	18 731 368	18 964 448	19 221 112	19 502 463	19 741 204	19 983 818	20 230 372	20 480 937	20 735 584	20 994 384	21 257 412	21 524 743	21 796 452

Model 6. Semi-nomadic farming – 120 female sheep (Awassi) (2/2)

Model 6.

	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
			Costs													
price of 120 sheep	-	40 050 000	-	-	-	-	-		-	-	-		-		-	-
milking machine		667 500	-	-	-	-	-		-	-	-	667 500	-	-	-	-
O&M milking machine		5 941	6 000	6 060	6 121	6 182	6 244	6 244	6 244	6 244	6 244	6 244	6 244	6 244	6 244	6 244
cow shed		1 068 000	-	-	-	-	-		-	-	-	1 068 000	-	-	-	-
small equipement		667 500	-	-	-	-	-		-	-	-	667 500	-	-	-	-
vehicle	-	-	-	-	-	-	-		-	-	-		-	-	-	-
processing equipement	-	-	-	-	-	-	-		-	-	-		-	-	-	-
family labour cost per cow	472 500	481 950	491 589	501 421	511 449	521 678	532 112	542 754	553 609	564 681	575 975	587 494	599 244	611 229	623 454	635 923
hired labour cost per cow	118 125	120 488	122 897	125 355	127 862	130 420	133 028	135 688	138 402	141 170	143 994	146 874	149 811	152 807	155 863	158 981
Labour costs per cow	630 000	602 438	614 486	626 776	639 311	652 098	665 140	665 140	665 140	665 140	665 140	665 140	665 140	665 140	665 140	665 140
Total production cost	1 220 625	43 663 816	1 234 973	1 259 612	1 284 744	1 310 377	1 336 523	1 349 826	1 363 395	1 377 235	1 391 352	3 808 751	1 420 439	1 435 420	1 450 701	1 466 287
									USD/day							
Net income per farm per year	16 942 377	- 25 327 753	17 290 204	17 471 756	17 679 704	17 910 734	18 165 940	18 391 378	18 620 423	18 853 137	19 089 585	16 926 832	19 573 945	19 821 992	20 074 042	20 330 165
Income with self consumption	17 027 817	- 25 243 025	17 374 157	17 554 870	17 761 911	17 991 965	18 246 122	18 473 165	18 703 845	18 938 228	19 176 378	17 015 361	19 664 244	19 914 097	20 167 989	20 425 991
Add net income	$	- 42 270 130	347 827	529 379	737 327	968 357	1 223 563	1 449 001	1 678 046	1 910 760	2 147 208	- 15 545	2 631 568	2 879 615	3 131 665	3 387 788
Add net income in USD	1 500	- 28 180	232	353	492	646	816	966	1 119	1 274	1 431	- 10	1 754	1 920	2 088	2 259
Number of sheep		16	32	64	96	128	160	192	224	256	256	256	256	256	256	256
value in USD Mdl 6_Sheep		- 450 881	7 420	22 587	47 189	82 633	130 513	185 472	250 588	326 103	366 457	- 2 653	449 121	491 454	534 471	578 183

Model 6																
Employment		16	32	64	192	256	320	384	448	512	512	512	512	512	512	512
Self-employment	2	32	64	128	384	512	640	768	896	1 024	1 024	1 024	1 024	1 024	1 024	1 024
Model 6		48	96	192	576	768	960	1 152	1 344	1 536	1 536	1 536	1 536	1 536	1 536	1 536

7. Model 7. Mixed system – Model 3 + Model 5

Model 7.

	WITHOUT	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
Model 3 Add net income (USD) Cow	0	- 99 849	- 930	33	1 022	1 438	2 064	2 064	2 064	2 064	2 064	- 1 496	2 064	2 064	2 064	2 064
Number of farms (Model 3)	0	5	10	20	30	40	50	60	70	70	70	70	70	70	70	70
Total additionnal net income - cows	0	-499 247	- 9 304	652	30 664	57 507	103 191	123 829	144 467	144 467	144 467	-104 733	144 467	144 467	144 467	144 467
Model 5 Add net income (USD) Goat	0	- 41 515	- 3 482	- 1 880	- 152	1 707	3 703	3 705	3 706	3 707	3 709	1 574	3 712	3 713	3 715	3 716
Number of farms SR (Model 7)	0	8	16	32	48	64	80	96	112	128	128	128	128	128	128	128
Total additionnal net income - goats	0	- 332 118	- 55 717	- 60 150	- 7 287	109 258	296 264	355 647	415 076	474 550	474 729	201 502	475 093	475 278	475 465	475 654
Total Mixed Model	0	**- 831 365**	**- 65 020**	**- 59 498**	**23 376**	**166 765**	**399 454**	**479 476**	**559 542**	**619 017**	**619 196**	**96 769**	**619 560**	**619 745**	**619 932**	**620 120**

8. Model 8. Processing 1

Model 8.																			
Value in Lira																			
Leben		Leben			WITHOUT Y0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Leben (Yougurt)	80%	Leben (Yougurt)	30%	liter	10 653 300	22 652 280	28 881 657	16 045 365	21 624 837	28 315 350	46 720 328	68 172 576	95 355 312	154 121 798	157 400 986	163 959 360	163 959 360	166 692 016	169 424 672	172 157 328
Labneh	20%	Labneh	70%		24 297 000	2 804 568	3 505 710	3 856 281	5 258 565	10 517 130	15 775 695	28 045 680	24 539 970	36 249 041	37 020 298	38 562 810	38 562 810	39 205 524	39 848 237	40 490 951
		Total Output			34 950 300	25 456 848	32 387 367	19 901 646	26 883 402	38 832 480	62 496 023	96 218 256	119 895 282	190 370 840	194 421 283	202 522 170	202 522 170	205 897 540	209 272 909	212 648 279
		1. Equipment																		
		Vat		lumpsum		10 680 000										10 680 000				
		milk cooler		lumpsum		10 680 000										10 680 000				
		generator		600-800$		1 068 000										1 068 000				
		refrigerator				667 500										667 500				
		cooling room				2 002 500										2 002 500				
		ph meter			0	225 000	0	225 000	0	225 000	0	225 000	0	225 000	0	0	225 000	0	225 000	0
		thermometer			1 335	5 393	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
		Sub-total Equipments			1 335	25 328 393	8 171	233 253	8 335	233 419	8 503	233 588	8 674	233 760	8 848	25 106 937	234 026	9 116	234 207	9 299
		2. Operating costs																		
		milk		liter	26 700 000	29 663 700	46 302 339	55 018 073	69 460 318	84 185 905	99 199 058	114 504 056	121 431 551	137 246 565	141 568 372	148 941 724	150 431 142	151 935 453	153 454 807	154 989 356
		water		LS	1 068 000,00	1 078 680,00	1 094 914,13	1 108 064,00	1 121 367,37	1 133 703,52	1 150 709,07	1 164 506,25	1 178 464,29	1 192 585,04	1 206 870,37	1 221 322,14	1 235 942,26	1 250 732,65	1 264 467,61	1 279 592,12
		electricity		monthly	3 204 000	3 236 040	3 268 400	3 301 084	3 334 095	3 367 436	3 401 111	3 435 122	3 469 473	3 504 168	3 539 209	3 574 601	3 610 347	3 646 451	3 682 915	3 719 745
		Labour family		Person	9 000 000	9 090 000	9 180 900	9 272 709	9 365 436	9 459 090	9 553 681	9 649 218	9 745 710	9 843 167	9 941 599	10 041 015	10 141 425	10 242 840	10 345 268	10 448 721
		Labour hired		Person	9 000 000	9 090 000	9 180 900	9 272 709	9 365 436	9 459 090	9 553 681	9 649 218	9 745 710	9 843 167	9 941 599	10 041 015	10 141 425	10 242 840	10 345 268	10 448 721
		detergents		LS	640 800	647 208	653 680	660 217	666 819	673 487	680 222	687 024	693 895	700 834	707 842	714 920	722 069	729 290	736 583	743 949
		Diesel		included	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Heating		LL/l	774 300	782 043	1 479 000	1 740 000	2 175 000	2 610 000	3 045 000	3 480 000	3 654 000	4 089 000	4 176 000	4 350 000	4 350 000	4 350 000	4 350 000	4 350 000
		bucket		nb	166 875	168 544	170 229	171 931	173 651	175 387	177 141	178 913	180 702	182 509	184 334	186 177	188 039	189 919	191 819	193 737
		O&M		LS	2 250 000	2 002 500	2 022 525	2 042 750	2 063 178	2 083 810	2 104 648	2 125 694	2 146 951	2 168 421	2 190 105	2 212 006	2 234 126	2 256 467	2 279 032	2 301 822
		others (transportation cost...)		LS	445 000	449 450	453 945	458 484	463 069	467 699	472 376	477 100	481 871	486 690	491 557	496 472	501 437	506 452	511 516	516 631
		Sub-total Operating costs			53 248 975	56 208 165	73 806 832	83 046 022	98 188 369	113 615 609	129 337 628	145 350 851	152 728 327	169 257 105	173 947 487	181 779 254	183 555 953	185 350 444	187 161 676	188 992 272
		Total Costs			53 250 310	81 536 558	73 815 003	83 279 275	98 196 704	113 849 028	129 346 131	145 584 439	152 737 001	169 490 866	173 956 335	206 886 190	183 789 979	185 359 560	187 395 883	189 001 572
		Net Margin		-	18 300 010 -	56 079 710 -	41 427 636 -	63 377 629 -	71 313 302 -	75 016 548 -	66 850 108 -	49 366 183 -	32 841 719	20 879 974	20 464 948 -	4 364 020	18 732 191	20 537 980	21 877 026	23 646 707
						- 37 779 700 -	23 127 626 -	45 077 619 -	53 013 292 -	56 716 538 -	48 550 098 -	31 066 173 -	14 541 709	39 179 984	38 764 958	13 935 990	37 032 201	38 837 990	40 177 036	41 946 717
Add net income in USD		Add net income in USD		-	12 200 -	25 186 -	15 418 -	30 052 -	35 342 -	37 811 -	32 367 -	20 711 -	9 694	26 120	25 843	9 291	24 688	25 892	26 785	27 964
Number of Units Mdl					60	3	6	12	18	24	30	36	42	48	48	48	48	48	48	48
value in USD Mdl 8		value in USD Mdl 8			-	75 559 -	92 511 -	360 621 -	636 160 -	907 465 -	971 002 -	745 588 -	407 168	1 253 759	1 240 479	445 952	1 185 030	1 242 816	1 285 665	1 342 295

9. Model 9. Processing 2

Model 9.																		
value in Lira			WITHOUT Y0	Y1	Y2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Leben (Yougurt)	30%	liter	10 653 300	22 428 000	29 004 210	16 453 875	21 410 730	28 035 000	46 257 750	67 497 600	94 411 200	57 223 440	65 664 000	68 400 000	68 400 000	69 540 000	70 680 000	71 820 000
Labneh	70%		24 297 000	2 776 800	3 471 000	3 818 100	5 206 500	10 413 000	15 619 500	97 188 000	24 297 000	125 615 490	144 144 000	150 150 000	150 150 000	152 652 500	155 155 000	157 657 500
Total Output			**34 950 300**	**25 204 800**	**32 475 210**	**20 271 975**	**26 617 230**	**38 448 000**	**61 877 250**	**164 685 600**	**118 708 200**	**182 838 930**	**209 808 000**	**218 550 000**	**218 550 000**	**222 192 500**	**225 835 000**	**229 477 500**
1. Equipment																		
Vat		lumpsum		10 680 000										10 786 800				
milk cooler		lumpsum		10 680 000										10 786 800				
refrigerator				1 068 000										1 078 680				
cooling room				667 500										674 175				
ph meter			0	227 250	0	231 818	0	236 477	0	241 230	0	246 079	0	0	253 536	0	258 632	261 218
thermometer			1 335	5 393	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
Sub-total Equipments			**1 335**	**23 328 143**	**8 171**	**240 070**	**8 335**	**244 896**	**8 503**	**249 818**	**8 674**	**254 840**	**8 848**	**23 335 392**	**262 562**	**9 116**	**267 839**	**270 517**
2. Operating costs																		
milk		liter	27 000 000	29 997 000	46 822 590	55 636 254	70 240 771	85 131 814	100 313 654	115 790 618	122 795 950	138 788 661	143 159 027	150 615 227	152 121 379	153 642 593	155 179 019	156 730 809
water		LS	1 068 000,00	1 078 680,00	1 094 914,13	1 108 064,00	1 121 367,37	1 133 703,52	1 150 709,07	1 164 506,25	1 178 464,29	1 192 585,04	1 206 870,37	1 221 322,14	1 235 942,26	1 250 732,65	1 264 467,61	1 279 592,12
electricity		monthly	3 204 000	3 236 040	3 268 400	3 301 084	3 334 095	3 367 436	3 401 111	3 435 122	3 469 473	3 504 168	3 539 209	3 574 601	3 610 347	3 646 451	3 682 915	3 719 745
Labour family		Person	9 000 000	9 090 000	9 180 900	9 272 709	9 365 436	9 459 090	9 553 681	9 649 218	9 745 710	9 843 167	9 941 599	10 041 015	10 141 425	10 242 840	10 345 268	10 448 721
Labour Hired		Person	9 000 000	9 090 000	9 180 900	9 272 709	9 365 436	9 459 090	9 553 681	9 649 218	9 745 710	9 843 167	9 941 599	10 041 015	10 141 425	10 242 840	10 345 268	10 448 721
detergents		LS	640 800	647 208	653 680	660 217	666 819	673 487	680 222	687 024	693 895	700 834	707 842	714 920	722 069	729 290	736 583	743 949
Diesel		included	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heating		LL/l	774 300	782 043	1 479 000	1 740 000	2 175 000	2 610 000	3 045 000	3 480 000	3 654 000	4 089 000	4 176 000	4 350 000	4 350 000	4 350 000	4 350 000	4 350 000
bucket		nb	166 875	168 544	170 229	171 931	173 651	175 387	177 141	178 913	180 702	182 509	184 334	186 177	188 039	189 919	191 819	193 737
O&M		LS	2 250 000	2 002 500	2 022 525	2 042 750	2 063 178	2 083 810	2 104 648	2 125 694	2 146 951	2 168 421	2 190 105	2 212 006	2 234 126	2 256 467	2 279 032	2 301 822
others (transportation cost...)			445 000	449 450	453 945	458 484	463 069	467 699	472 376	477 100	481 871	486 690	491 557	496 472	501 437	506 452	511 516	516 631
Sub-total Operating costs			**53 548 975**	**56 541 465**	**74 327 083**	**83 664 203**	**98 968 822**	**114 561 518**	**130 452 224**	**146 637 414**	**154 092 727**	**170 799 201**	**175 538 143**	**183 452 756**	**185 246 191**	**187 057 584**	**188 885 887**	**190 733 726**
Total Costs			53 550 310	79 869 608	74 335 254	83 904 273	98 977 157	114 806 414	130 460 727	146 887 232	154 101 401	171 054 041	175 546 991	206 788 148	185 508 752	187 066 700	189 153 726	191 004 243
Net Margin			**- 18 600 010**	**- 54 664 808**	**- 41 860 044**	**- 63 632 298**	**- 72 359 927**	**- 76 358 414**	**- 68 583 477**	**17 798 368**	**- 35 393 201**	**11 784 889**	**34 261 009**	**11 761 852**	**33 041 248**	**35 125 800**	**36 681 274**	**38 473 257**
				- 36 064 798	**- 23 260 034**	**- 45 032 288**	**- 53 759 917**	**- 57 758 404**	**- 49 983 467**	**36 398 378**	**- 16 793 191**	**30 384 899**	**52 861 019**	**30 361 862**	**51 641 258**	**53 725 810**	**55 281 284**	**57 073 267**
Add net income in USD				**- 24 043**	**- 15 507**	**- 30 022**	**- 35 840**	**- 38 506**	**- 33 322**	**24 266**	**- 11 195**	**20 257**	**35 241**	**20 241**	**34 428**	**35 817**	**36 854**	**38 049**
Number of Units Mdl 9			**60**	3	6	12	18	24	30	**36**	**42**	**48**	**48**	**48**	**48**	**48**	**48**	**48**
value in USD Mdl 9			-	- 72 130	- 93 040	- 360 258	- 645 119	- 924 134	- 999 669	873 561	- 470 209	972 317	1 691 553	971 580	1 652 520	1 719 226	1 769 001	1 826 345

10. Model 10. Processing 3

Model 10. Value in Lira	WITHOUT Y0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Output																
Leben (Yougurt)	88 777 500	89 665 275	90 561 928	91 467 547	92 382 222	410 546 597	376 956 421	380 725 985	384 533 245	388 378 577	392 262 363	402 788 070	413 485 064	424 355 720	435 402 440	446 627 660
Labneh	86 775 000	89 833 819	90 732 157	93 874 588	94 813 334	536 264 215	541 626 857	586 117 635	591 978 811	597 898 599	603 877 585	620 081 634	636 549 375	653 284 464	670 290 599	687 571 529
Hallumi	73 425 000	74 159 250	74 900 843	79 432 343	80 226 667	405 144 668	409 196 115	413 288 076	417 420 956	421 595 166	425 811 118	454 726 531	484 756 832	460 649 301	472 640 807	484 826 078
Baladi	77 875 000	78 653 750	79 440 288	80 234 690	81 037 037	409 237 038	413 329 409	417 462 703	421 637 330	425 853 703	430 112 240	423 987 442	417 112 126	465 302 325	477 414 957	489 723 311
Total Output	**326 852 500**	**332 312 094**	**335 635 215**	**345 009 169**	**348 459 260**	**1 761 192 518**	**1 741 108 801**	**1 797 594 398**	**1 815 570 342**	**1 833 726 045**	**1 852 063 306**	**1 901 583 676**	**1 951 903 398**	**2 003 591 810**	**2 055 748 803**	**2 108 748 577**
1. Equipment																
ph meter	0	202 253	204 275	206 318	208 381	210 465	212 569	214 695	216 842	219 010	221 201	223 413	225 647	227 903	230 182	232 484
thermometer	1 335	5 393	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
Vacuum packager		2 670 000	2 696 700	2 723 667	2 750 904	2 778 413	2 806 197	2 834 259	2 862 601	2 891 227	2 920 140	2 949 341	2 978 834	3 008 623	3 038 709	3 069 096
cheese press		1 335 000	1 348 350	1 361 834	2 750 904	5 556 825	5 612 394	5 668 518	5 725 203	5 782 455	5 840 279	5 898 682	5 957 669	6 017 246	6 077 418	6 138 192
Labneh drainer		267 000	0		269 670				272 367	0	0		275 090			
Reburfishment	0	2 670 000										2 696 700				
Sub-total Equipments	**1 335**	**7 149 646**	**4 257 496**	**4 300 071**	**5 988 194**	**8 554 121**	**8 639 663**	**8 726 059**	**9 085 687**	**8 901 453**	**8 990 468**	**11 777 072**	**9 446 266**	**9 262 888**	**9 355 517**	**9 449 072**
2. Operating costs																
milk	300 000 000	450 000 000	750 000 000	1 050 000 000	1 350 000 000	1 500 000 000	1 500 000 000	1 500 000 000	1 500 000 000	1 500 000 000	1 500 000 000	1 525 000 000	1 550 000 000	1 575 000 000	1 600 000 000	1 625 000 000
water	1 602 000	1 618 020	1 634 200	1 650 542	1 667 048	1 683 718	1 700 555	1 717 561	1 734 736	1 752 084	1 769 605	1 787 301	1 805 174	1 823 225	1 841 458	1 859 872
electricity	25 632 000	25 888 320	26 147 203	26 408 675	26 672 762	26 939 490	27 208 885	27 480 973	27 755 783	28 033 341	28 313 674	28 596 811	28 882 779	29 171 607	29 463 323	29 757 956
Labour family	18 000 000	18 180 000	18 361 800	18 545 418	18 730 872	18 918 181	19 107 363	19 298 436	19 491 421	19 686 335	19 883 198	20 082 030	20 282 851	20 485 679	20 690 536	20 897 441
Labour hired	18 000 000	18 180 000	18 361 800	18 545 418	18 730 872	18 918 181	19 107 363	19 298 436	19 491 421	19 686 335	19 883 198	20 082 030	20 282 851	20 485 679	20 690 536	20 897 441
detergents	1 602 000	134 835	136 183	137 545	138 921	140 310	141 713	143 130	144 561	146 007	147 467	148 942	150 431	151 935	153 455	154 989
Diesel	2 002 500	2 696 700	2 723 667	2 750 904	2 778 413	2 806 197	2 834 259	2 862 601	2 891 227	2 920 140	2 949 341	3 028 482	3 108 910	3 190 645	3 273 703	3 358 103
bucket	23 779 688	24 017 484	24 257 659	24 500 236	24 745 238	109 967 838	100 970 470	101 980 175	102 999 976	104 029 976	105 070 276	107 889 662	110 754 928	113 666 711	116 625 654	119 632 409
packaging	14 685	15 203	15 355	15 886	16 045	90 752	91 660	99 189	100 181	101 183	102 195	103 217	104 249	105 291	106 344	107 408
Pouches	5 340 000	5 393 400	5 447 334	5 604 966	5 661 016	28 588 130	28 874 012	29 162 752	29 454 379	29 748 923	30 046 412	30 572 523	31 096 875	32 504 691	33 350 845	34 210 671
O&M	2 002 500	2 022 525	2 042 750	2 063 178	2 083 810	2 104 648	2 125 694	2 146 951	2 168 421	2 190 105	2 212 006	2 234 126	2 256 467	2 279 032	2 301 822	2 324 840
others (transportation cost...)	445 000	449 450	453 945	458 484	463 069	467 699	472 376	477 100	481 871	486 690	491 557	496 472	501 437	506 452	511 516	516 631
Sub-total Operating costs	**398 420 373**	**548 595 937**	**849 581 896**	**1 150 681 252**	**1 451 688 065**	**1 710 625 144**	**1 702 634 349**	**1 704 667 305**	**1 706 713 978**	**1 708 781 118**	**1 710 868 929**	**1 740 021 595**	**1 769 226 951**	**1 799 370 947**	**1 829 009 191**	**1 858 717 762**
Sub-total other variable costs																
Total Costs	**398 421 708**	**555 745 583**	**853 839 392**	**1 154 981 323**	**1 457 676 259**	**1 719 179 266**	**1 711 274 012**	**1 713 393 364**	**1 715 799 665**	**1 717 682 571**	**1 719 859 397**	**1 751 798 667**	**1 778 673 218**	**1 808 633 835**	**1 838 364 707**	**1 868 166 834**
Net Margin	**- 71 569 208**	**- 223 433 489**	**- 518 204 178**	**- 809 972 155**	**- 1 109 216 998**	**42 013 252**	**29 834 789**	**84 201 034**	**99 770 677**	**116 043 474**	**132 203 909**	**149 785 009**	**173 230 180**	**194 957 975**	**217 384 096**	**240 581 743**
	-	**151 864 282**	**- 446 634 970**	**- 738 402 947**	**- 1 037 647 791**	**113 582 460**	**101 403 997**	**155 770 241**	**171 339 885**	**187 612 682**	**203 773 117**	**221 354 216**	**244 799 388**	**266 527 183**	**288 953 303**	**312 150 950**
Add net income in USD	**-**	**101 243**	**- 297 757**	**- 492 269**	**- 691 765**	**75 722**	**67 603**	**103 847**	**114 227**	**125 075**	**135 849**	**147 569**	**163 200**	**177 685**	**192 636**	**208 101**
Number of Units Mdl 10	**20**	1	2	4	6	8	10	**12**	**14**	**16**	**16**	**16**	**16**	**16**	**16**	**16**
value in USD Mdl 10	- -	101 243	- 595 513	- 1 969 075	- 4 150 591	605 773	676 027	1 246 162	1 599 172	2 001 202	2 173 580	2 361 112	2 611 193	2 842 957	3 082 169	3 329 610

11. Model 11. Processing 4

Model 11.																
Value in Lira	**WITHOUT Y0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**
Output																
Leben (Yougurt)	84 105 000	127 419 075	214 488 776	303 287 130	393 840 001	388 938 881	357 116 609	360 687 775	384 533 245	367 937 599	371 616 975	381 588 698	391 722 693	402 021 208	412 486 522	446 627 660
Labneh	86 775 000	89 833 819	90 732 157	93 874 588	94 813 334	536 264 215	541 626 857	586 117 635	591 978 811	597 898 599	603 877 585	620 081 634	636 549 375	653 284 464	670 290 599	687 571 529
Hallumi	73 425 000	74 159 250	74 900 843	79 432 343	80 226 667	243 086 801	245 517 669	247 972 845	250 452 574	252 957 100	255 486 671	262 342 230	269 309 351	276 389 581	283 584 484	290 895 647
Baladi	77 875 000	78 653 750	79 440 288	80 234 690	81 037 037	409 237 038	413 329 409	417 462 703	421 637 330	425 853 703	430 112 240	423 987 442	417 112 126	465 302 325	477 414 957	489 723 311
White cheese with herbs						1 800 000	3 636 000	3 672 360	3 709 084	3 746 174	3 783 636	3 885 164	3 988 344	3 898 284	3 937 267	4 639 413
Total Output	**322 180 000**	**370 065 894**	**459 562 063**	**556 828 751**	**649 917 039**	**1 579 326 935**	**1 561 226 544**	**1 615 913 318**	**1 652 311 043**	**1 648 393 176**	**1 664 877 107**	**1 691 885 166**	**1 718 681 889**	**1 800 895 862**	**1 847 713 829**	**1 919 457 559**
		47 885 894	**89 496 169**	**97 266 688**	**93 088 288**	**929 409 896**	**-18 100 392**	**54 686 774**	**36 397 725**	**-3 917 867**	**16 483 932**	**27 008 059**	**26 796 722**	**82 213 973**	**46 817 967**	**71 743 729**
1. Equipment																
Vat		5 340 000										10 786 800				
milk cooler		24 030 000										48 540 600				
generator		534 000										1 078 680				
refrigerator		333 750										674 175				
cooling room		6 675 000										13 483 500				
ph meter		200 250	375 000	375 000	225 000	225 000	225 000	225 000	225 000	225 000	225 000	600 000	225 000	225 000	225 000	225 000
thermometer	1 335	5 393	8 171	8 253	8 335	8 419	8 503	8 588	8 674	8 760	8 848	8 937	9 026	9 116	9 207	9 299
Vacuum packager		3 000 000	3 000 000									6 000 000				
cheese press		1 500 000	1 500 000									2 700 000				
Labneh drainer		300 000	300 000									1 200 000				
Reburfishment	0	3 000 000										4 500 000				
Sub-total Equipments	**1 335**	**44 918 393**	**5 183 171**	**383 253**	**233 335**	**233 419**	**233 503**	**233 588**	**233 674**	**233 760**	**233 848**	**89 572 692**	**234 026**	**234 116**	**234 207**	**234 299**
2. Operating costs																
milk	135 000 000	300 000 000	500 000 000	700 000 000	900 000 000	1 000 000 000	1 000 000 000	1 000 000 000	1 000 000 000	1 000 000 000	1 500 000 000	1 500 000 000	1 550 000 000	1 575 000 000	1 600 000 000	1 625 000 000
water	1 800 000	1 818 000	1 836 180	1 854 542	1 873 087	1 891 818	1 910 736	1 929 844	1 949 142	1 968 633	1 988 320	2 008 203	2 028 285	2 048 568	2 069 054	2 089 744
electricity	28 800 000	29 088 000	29 378 880	29 672 669	29 969 395	30 269 089	30 571 780	30 877 498	31 186 273	31 498 136	31 813 117	32 131 248	32 452 561	32 777 086	33 104 857	33 435 906
Labour family	18 000 000	18 180 000	18 361 800	18 545 418	18 730 872	18 918 181	19 107 363	19 298 436	19 491 421	19 686 335	19 883 198	20 082 030	20 282 851	20 485 679	20 690 536	20 897 441
Labour hired	18 000 000	18 180 000	18 361 800	18 545 418	18 730 872	18 918 181	19 107 363	19 298 436	19 491 421	19 686 335	19 883 198	20 082 030	20 282 851	20 485 679	20 690 536	20 897 441
detergents	1 800 000	200 000	250 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	400 000	400 000	400 000	400 000	400 000	400 000
Diesel	5 625	7 500	7 575	7 651	7 727	4 683	4 730	4 777	4 825	4 873	4 922	4 500	4 545	4 590	4 636	4 683
bucket	25 312 500	37 968 750	63 281 250	88 593 750	113 906 250	111 375 000	101 250 000	101 250 000	106 875 000	101 250 000	101 250 000	102 937 500	104 625 000	106 312 500	108 000 000	115 781 250
packaging	16 500	16 913	16 913	17 325	17 325	17 325	97 020	103 950	103 950	103 950	103 950	103 950	103 950	103 950	103 950	103 950
Pouches	6 000 000	6 000 000	6 000 000	6 112 500	6 112 500	6 112 500	25 837 500	25 837 500	25 837 500	25 837 500	25 837 500	25 505 625	25 148 750	27 129 375	27 560 000	27 990 625
O&M	2 250 000	2 272 500	2 295 225	2 318 177	2 341 359	2 364 773	2 388 420	2 412 305	2 436 428	2 460 792	2 485 400	2 510 254	2 535 356	2 560 710	2 586 317	2 612 180
others (transportation cost...)	500 000	1 000 000	1 010 000	1 020 100	1 030 301	1 040 604	1 051 010	1 061 520	1 072 135	1 082 857	1 093 685	1 104 622	1 115 668	1 126 825	1 138 093	1 149 474
Sub-total Operating costs	**237 484 625**	**414 731 663**	**640 799 623**	**866 887 550**	**1 092 919 689**	**1 191 112 154**	**1 201 525 922**	**1 202 274 266**	**1 208 648 094**	**1 203 779 411**	**1 704 743 290**	**1 706 869 963**	**1 758 979 817**	**1 788 434 963**	**1 816 347 979**	**1 850 362 695**
Sub-total other variable costs																
Total Costs	**237 485 960**	**459 650 056**	**645 982 794**	**867 270 802**	**1 093 153 025**	**1 191 345 572**	**1 201 759 425**	**1 202 507 854**	**1 208 881 768**	**1 204 013 171**	**1 704 977 138**	**1 796 442 654**	**1 759 213 843**	**1 788 669 079**	**1 816 582 187**	**1 850 596 994**
Net Margin	**84 694 040**	**- 89 584 162**	**- 186 420 730**	**- 310 442 051**	**- 443 235 986**	**387 981 363**	**359 467 119**	**413 405 464**	**443 429 275**	**444 380 005**	**- 40 100 031**	**-104 557 488**	**- 40 531 954**	**12 226 783**	**31 131 643**	**68 860 565**
		- 174 278 202	**- 271 114 770**	**- 395 136 091**	**- 527 930 026**	**303 287 323**	**274 773 079**	**328 711 424**	**358 735 235**	**359 685 965**	**- 124 794 071**	**- 189 251 528**	**- 125 225 994**	**- 72 467 257**	**- 53 562 397**	**- 15 833 475**
Add net income in USD		**- 116 185**	**- 180 743**	**- 263 424**	**- 351 953**	**202 192**	**183 182**	**219 141**	**239 157**	**239 791**	**- 83 196**	**- 126 168**	**- 83 484**	**- 48 312**	**- 35 708**	**- 10 556**
Number of Units Mdl 11	**20**	1	2	4	6	8	10	**12**	**14**	**16**	**16**	**16**	**16**	**16**	**16**	**16**
$ value - Mdl 11	0	- 116 185	- 361 486	- 1 053 696	- 2 111 720	1 617 532	1 831 821	2 629 691	3 348 196	3 836 650	- 1 331 137	- 2 018 683	- 1 335 744	- 772 984	- 571 332	- 168 890

12. Project economic analysis (all models)

Value in USD millions	WITHOUT Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
Model 1.	-	- 3,54	0,04	0,22	0,55	0,87	1,34	1,61	1,87	2,14	2,14	2,14	2,14	2,14	2,14	2,14
Model 2.	-	- 4,01	-0,33	0,13	0,46	0,92	1,29	1,48	1,80	2,13	2,20	2,28	- 0,20	2,43	2,51	2,22
Model 3.	-	- 4,79	-0,09	0,01	0,29	0,55	0,99	1,19	1,39	1,59	1,59	-1,15	1,59	1,59	1,59	1,59
Model 4.	-	- 2,11	-0,04	0,03	0,23	0,56	0,82	0,97	1,14	1,30	1,31	0,03	1,31	1,32	1,32	1,33
Model 5. Goat	-	- 2,32	-0,39	-0,42	-0,05	0,76	2,07	2,49	2,91	3,32	3,32	1,41	3,33	3,33	3,33	3,33
Model 6. Sheep	-	- 0,45	0,01	0,02	0,05	0,08	0,13	0,19	0,25	0,33	0,37	-	0,45	0,49	0,53	0,58
Model 7. Mixte	-	- 0,83	-0,07	-0,06	0,02	0,17	0,40	0,48	0,56	0,62	0,62	0,10	0,62	0,62	0,62	0,62
Total Livestock	-	-18,06	-0,88	-0,07	1,55	3,91	7,05	8,40	9,91	11,42	11,55	4,81	9,24	11,92	12,04	11,80
Total Processing units	-	- 0,37	-1,14	-3,74	-7,54	0,39	0,54	4,00	4,07	8,06	3,77	1,76	4,11	5,03	5,57	6,33
Total Additionnal benefit	-	-18,42	-2,02	-3,74	-5,99	4,31	7,58	12,41	13,98	19,49	15,32	6,57	13,35	16,95	17,61	18,13
Economic Costs	-	2,63	2,32	2,07	1,80	1,80	1,62	0,32	0,32	0,32	0,32	0,32	0,32	0,32	0,32	0,32
Total	-	**-21,05**	**-4,34**	**-5,81**	**-7,79**	**2,51**	**5,96**	**12,08**	**13,66**	**17,69**	**15,00**	**4,95**	**13,03**	**16,62**	**17,28**	**17,80**

ERR (%)	16,20%
NPV (USD million)	22,20

Appendix 11: Draft project implementation manual

1. A draft PIM was prepared during the final design stage, **to be finalised at project start up** according to the following outline, is available at NEN HALEPP file:

   (a) Chapter 1: Introduction and background

   (b) Chapter 2: HALEPP Summary

   (c) Chapter 3: Project Organisation and Management

   (d) Chapter 4: Procurement Procedures

   (e) Chapter 5: Finance Management

   (f) Chapter 6: Management Information System

   (g) Chapter 7: Guidelines for preparing Annual Work Plan and Budget

   KEY ANNEXES

   (h) Project Log-frame, updated

   (i) RIMS/CIs Indicators

   (j) Template for AWPB

   (k) TOR for PD staff

   (l) Procurement Plan

   (m) Sample form for Record of Contracts

   (n) Sample form for tracking individual contracts

Appendix 12: Compliance with IFAD policies

Adherence to IFAD policies

1. The project is in line with IFAD Strategic Framework 2016-2025. The project activities, implementation arrangements and M&E system have been designed in compliance with IFAD Targeting Policy, IFAD policy on gender equality and women's empowerment and in line with the approaches outlined in the Framework for Gender Mainstreaming in IFAD investment Operations. The project is designed to be consistent with IFAD's Private Sector Development and Partnership Strategy, its Rural Finance Policy and the associated Decision Tools for Rural Finance. Finally, the project will be aligned with both IFAD's Climate Change Strategy and its Environment and Natural Resource Management Policy. The preliminary Environmental and Social category is B, considering that the project approach will promote use of climate resilient technologies (e.g. solar energy and biogas technologies), and improved management of animal raising and dairy processing.

A. Strategic Framework (2016-2025)

2. IFAD's Strategic Framework (2016-2025) reiterates its unique mandate of improving rural food security and nutrition and enabling rural women and men to overcome poverty. The framework identified three closely interlinked and mutually reinforcing strategic objectives: Increase poor rural people's productive capacities; Increase poor rural people's benefits from market participation; and strengthen the environmental sustainability and climate resilience of poor rural people's economic activities. HALEPP is designed to empower smallholder dairy producers and processors, men and women, by strengthening their organizations, capacities, skills, enabling them to enhance their productive capacity and enhance their links with markets for production, processing and marketing of good quality milk and dairy products

B. Targeting- Reaching the Poor and Gender Mainstreaming

3. The project activities, implementation arrangements and M&E system are designed in compliance with the IFAD targeting strategy as well as the Framework for Mainstreaming Gender in IFAD investments. HALEPP would have a strong poverty, vulnerability and gender focus. The project would focus on the Lebanese communities who are among the poorest and the most affected by the influx of Syrian refugees as well as Syrian refugees by implementing its interventions on the 151 cadasters in which 67% of the most deprived Lebanese and 87% of Syrians live. The project would further sharpen its poverty focus by conducting a targeting exercise in these areas using poverty criteria in addition to the number of livestock owned to rank the target group for the different project activities, in an objective and transparent manner. Women and youth would be prioritized for all project activities. The participation of women and youth will be carefully monitored throughout the implementation process during project supervision as well as through RIMS reporting. Gender disaggregated data will be included in the RIMS reporting. The appendix on poverty targeting and gender outlines the Project approach to these two important aspects and includes the targeting and gender check lists.

C. Private Sector Development and Partnership Strategy (2005)

4. IFAD outlined its strategy for private-sector development and partnership in April 2005 and further refined it in 2011.[34] IFAD intends to deepen its engagement with a range of private sector providers with the aim of creating markets for its target groups; improving their access to inputs, services, knowledge and technology; and increasing income-generating or job-creating opportunities for its target populations. The project has an essential part to play in equipping the rural poor to interact more equitably with dairy market forces and in making market relationships work for them. The project design is in full accord with this strategy and places strong emphasis

[34] Private-Sector Strategy. Deepening IFAD's engagement with the private sector, IFAD, February 2012.

on further developing and strengthening the linkages of smallholder dairy producers and processors with the private sector, including animal feed suppliers, private vets, suppliers of solar and bio-gas technologies, market outlets for dairy marketing, and private banks for possible financing.

D. Rural Finance Policy (2009) Decision Tools (2010) and Technical Note (2011)

5. The design of the HALEPP Project is fully compliant with IFAD Rural Finance Policy and the IFAD Decision Tools for Rural Finance including its six guiding principles namely: (i) support access to a variety of financial services; (ii) promote a wide range of financial institutions, models and delivery channels; (iii) support demand-driven and innovative approaches; (iv) encourage – in collaboration with private sector partners – market-based approaches that strengthen rural financial markets, avoid distortions in the financial sector and leverage IFAD's resources; (v) develop and support long-term strategies focusing on sustainability and poverty outreach; and (vi) participate in policy dialogues that promote an enabling environment for rural finance.

6. The Project will not provide loans to the target group given the healthy banking system in Lebanon and the strong liquidity within the financial system. Instead, the project will assist in developing special loan products which suit the specific profile of its target group and will provide them opportunities for funding dairy production and processing and other related activities such feeding and input supply. Project interventions will not in any way distort the market.

E. Social Environmental and Climate Assessment Review Note

7. The design mission reviewed the Social Environmental and Climate Assessment Procedures to determine the status of the HALEPP project with respect to its requirements. In view of project measures to reduce GHG emissions, the manure treatment, the use of renewable energy as well as the strong capacity building component leading to the optimisation of the different cycles of production it is proposed to classify the project as posing **moderate socio-environmental risks at this design state, category B**.

8. All the measures proposed in the project aim at minimizing the climate risk, in terms of optimization of the production cycle, use of renewable energy as well as the training activities for smallholders to adopt a more modern and health safety approach in relation to the environment. Therefore, a preliminary classification of a **moderate climate risk** is proposed at this stage.

Appendix 13: Contents of the project life file

1. IFAD Strategic Framework 2016-2025, IFAD 2015
2. Country Strategy Note for Lebanon, IFAD 2016
3. Facility for Refugees, Migrants, Forced Displacement and Rural Stability (FARMS), IFAD 2016
4. HALEPP Project Concept Note, IFAD, September 2016
5. HALEPP detailed design, Aide Memoire, IFAD February 2017
6. SECAP report, IFAD March 2017
7. Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL) project. Project Design Report, IFAD 2012
8. Hilly Areas Sustainable Agricultural Development Project (HASAD, Project Design Report, IFAD, 2009
9. Hilly Areas Sustainable Agricultural Development Project (HASAD), Supervision report, IFAD November 2016
10. Agriculture Infrastructure Development Project, project Completion Report, IFAD, 2007
11. Irrigation Rehabilitation and Modernization Project, Project Completion Report, IFAD, 2004
12. Upgrading the technical agriculture education system in Lebanon, Project design Document, FAO, 2016
13. Country Partnership Framework for Lebanon for 2017-2022, World Bank, June 2016
14. Ministry of Agriculture Strategy 2015 - 2019, Ministry of Agriculture November 2014
15. Lebanon Crisis Response Plan 2017-2020, UN Office for the Coordination of Humanitarian Affairs, Government of Lebanon, January 2017
16. Syria Regional Refugee Response - UNHCR Data Portal
17. Draft PIM
18. WFP in Lebanon, various reports