



Beekeeping for Poverty Alleviation and Sustainable Rural Livelihood

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Project Development Report

ABSTRACT

Around 21% of the Lebanese population lives in the poor zone, with 39% of them living under conditions of extreme poverty, most of which inhabit in rural areas.

It is becoming a challenge to empower rural regions and prevent deteriorating living conditions from spreading in remote areas. The areas where agricultural activities are mainly concentrated, characterizing with insufficient diversification and high risk due to unstable environmental conditions.

In these regions, the majority of people live on subsistence farming and producing few crops, which makes them vulnerable to shocks of all kinds. What is really needed to alleviate living conditions and improve the situation of rural farmers is a low risk high revenue activity that provides them with additional revenue and acts as an aiding activity.

Poverty is a main characteristic of remote rural areas, but not the only one. Rural regions of Lebanon are rich in trees and diversified plants, which makes it very suitable for beekeeping and honey production activities. But because of the lack in income and technical experience in this field, farmers have been tending to avoid beekeeping and limiting their activities to traditional farming only, which is eventually affecting the whole ecosystem, and further exacerbating the problems of livelihood.

Engineers Without Borders Lebanon launched a project to support farmers in rural regions in Lebanon through a small scale project as a first step to portray the untapped potential for strategically investing in apiculture, particularly in beekeeping, as a viable alternative means of income for the most disadvantaged families in rural areas of Lebanon. This would further increase the capacity of the community to break out of poverty.

The project constitutes of two phases. The first starts with one family that will be committed to provide EWB-Lebanon with the swarming colonies. The second phase identifies a new family and provides it with bee colonies to repeat the same process as in phase 1.

The project supports poor families in rural areas of Lebanon through introducing the concept of sustainable beekeeping and providing them with education, financial support, and technical cooperation in the field. Aiming at achieving the following results:

- 1) Increase the technical knowledge and skills of small scale beekeepers
- 2) Increase the income of beneficiaries
- 3) Provide the transition to ecological honey production
- 4) Provide safe and healthy honey to consumer
- 5) Promote working groups and networking potential

The project period starts in 2012 and ends in 2014, with an overall budget of \$4,400, of which \$1,200 are in kind contribution, and 1,700 are secured through a contribution from EWB-Lebanon and a sponsorship by an environmental company. The rest \$1,500 are required for second phase of the project and would be secured through fundraising and sponsorships.

This report presents the project implemented by EWB-Lebanon in partial fulfillment of the CAS in Management of Development Projects, and states the steps taken and the achievements accomplished in collaboration with local partners.

The contents of the report are not meant to provide a project evaluation or a complete project proposal; it is limited to project description and presentation of major activities.

Keywords: *Beekeeping, Rural development, Apiculture, Sustainable rural livelihood*

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INTRODUCTION

BACKGROUND

Lebanon is a developing country in the Middle East with a urbanization rate of around 90% and growing. In this high middle income country, it is becoming a challenge to empower rural regions and prevent demoted living conditions from spreading in remote areas, where agricultural activities are mainly concentrated. Poverty is a main characteristic of remote rural areas in Lebanon, which is mainly caused by the lack of diversified source of income.

Beekeeping is known to have many attractions for rural farmers, as this activity does not require daily attention and does not really take up valuable land or time which would have been spent on other farming activities. In rural communities where availability of financing is limited and constricted to certain agricultural activities, small-scale beekeeping can contribute significantly to livelihood security.

It is estimated that there are around 5,250 beekeepers in Lebanon running around 175,000 beehives all over the country. The market is dominated by big beekeeping industrialists with massive honey production, each running more than 200 beehives. While small beekeepers have no more than 20 beehives each with most of them with less than 10 beehives mainly dedicated for honey production. The number of small beekeepers is decreasing tremendously, caused mainly by the uncontrolled loss of beehives and improper implementation of technical skills.

PROJECT DESCRIPTION

The project starts by selecting one poor family from a rural region in Lebanon with previous experience in beekeeping, and works closely with the family members to reconsider beekeeping as a side activity to help produce natural honey.

The family is supplied with the tools and equipment needed to perform beekeeping activities, and provided with bee colonies in eight beehives to be raised and used for honey as well as queen bee production.

The role of EWB-Lebanon is to provide the material and lead training and educational sessions in partnership with local experts in the field. The beneficiary is committed to keep close coordination with the organization for a period of two years, reporting problems and following the recommendations of the team leader.

This all is offered to the beekeeper free of charge, the only requirement the family should commit to is to capture and keep the new bee colonies created through artificial or natural swarming in good condition for the period of two years. EWB-Lebanon will collect the new colonies and use them to implement a similar activity in the second phase of the project with another underdeveloped family. EWB-Lebanon has the right to perform artificial swarming only once for each beehive during the project period.

The beekeeper is also asked to participate in future training sessions and train other beekeepers in later phases of the project.

The second phase of the project starts while still coordinating with the first beneficiary. During this phase the same process will be repeated with a new family to create a sustainable activity at reduced costs.

PROJECT SUMMARY

Title:	Beekeeping for Poverty Alleviation and Sustainable Rural Livelihood
Organization:	Engineers Without Borders – Lebanon (www.ewb-lebanon.org)
Donor:	Green Arms (www.greenarms.co.uk)
Partner:	Eiffel Association for Beekeeping
Location:	Underdeveloped rural regions in Lebanon
Period:	2012 – 2014
Target Group:	Former beekeepers and unemployed young people
Overall Budget:	\$4,400
Team Leader:	Nader Hajj Shehadeh (nader@ewb-lebanon.org)

PROJECT PLANNING

The project cycle includes two major phases starting with the design phase that involves baseline analysis, needs assessment, and project design, and then the implementation phase including planning, implementation, and followed by a monitoring and evaluation system.

BASELINE ANALYSIS AND NEEDS ASSESSMENT

In order to learn about the current situation and the problems facing the target group, a participatory approach baseline analysis is performed to better understand the reality of the issues, how they interrelate, how they evolved, and how urgent they rank. Needs assessment is also performed to identify, prioritize, and level the needs.

The target group in this case is the local community, which makes it most appropriate to start the situation analysis there and then extend the perspective gradually. So the ripple starts with the inhabitants of rural areas who live in poor conditions, and then moves out to the farmers and families conducting agricultural activities. These groups are met randomly in poor regions of the country and interviewed to understand their needs and problems.

The third level includes meetings with beekeepers and those who used to be in business but stopped for any reason, to conclude with a fourth level that included beekeeping experts and suppliers who have good experience about the situation in rural areas and the problems facing small scale beekeepers.

The research performed has identified a root cause of poverty in the rural regions of the country, which turned out to be the lack of diversified sources of income and the restriction to certain agricultural activities.

It also reached basic conclusions regarding the decrease in beekeeping activities and giving away this additional source of income. It was clear that the low technical skills and the lack of financial support have been playing a major role in reducing the interest of local farmers and agricultural workers in beekeeping and honey production.

The survey questionnaire is originally performed in Arabic. A translated version with the results of the survey is presented in appendices A and B.

On another note, national reports and studies show that Lebanon imports around 50% of its honey consumption, which is due to the insufficiency of honey supplied locally. This has raised the issue of the instauration of the market, and the deficit in supply that has not been able to meet the demand. From this perspective, honey products seem to still have enough room in the market, which is tending to demand local production rather than imported products.

PROJECT DESIGN

The overall project's target group is selected to be poor farmers from rural areas, with an aim to provide them with additional sources of income and reduce their insecurity.

Honey production has been reported to be a reliable revenue generating activity, with a very high rate of business development. The results of survey conducted among farmers and rural inhabitants, this activity seems to be interesting and favored by almost all respondents, but should be provided with sufficient technical and financial support.

To do so, the five major capital assets of beekeeping are identified and discussed individually to remove barriers and create sustainability in this activity, based on which the actions and initiatives are planned to compliment the needs of the beekeepers as identified through the needs assessment process. The main assets are shown in Figure 1.

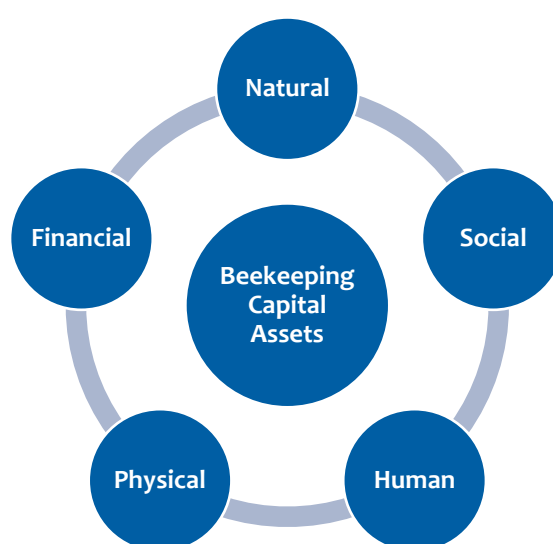


Figure 1: The major five beekeeping capital assets

(1) The natural capital:

It includes bee colonies, productive land field, and good environmental resources. The first is supplied by the project, while the rest should be originally available to ensure sufficient resources for productive beekeeping.

(2) The social capital

The social capital includes support offered by neighbors, family, friends, and networks. This is necessary to provide access to more resources, information, support, and associations. It is not expected to have all this available, but the project would work on increasing the social capital and creating more efficient networking.

(3) The human capital

This is a major asset that includes the technical and practical skills, knowledge, marketing expertise, health and good physical conditions. For the first phase of the project, it is required to have some basic expertise already available in an aim to reduce startup risk, while in the other phases there are no restrictions or minimum requirements.

The project focuses on capacity building and trainings among beekeepers and other family members to enhance the human capital.

(4) The physical capital

This includes the tools and equipment needed for beekeeping. These should be made available by the project, and the beekeepers will be trained to use them properly and avoid any contamination or improper applications.

(5) The financial capital

This includes the availability of cash and credit loans, which is normally inexistent for the poor living in rural areas. It is required for the development of the business, and should be ensured in case the beekeepers wish to expand the beekeeping activities at a later stage.

LOGICAL FRAMEWORK

Table 1: Logical framework analysis

Project Structure	Intervention Logic	Indicators	Means of Verification	Assumptions
Development Objective	<ul style="list-style-type: none"> - Create a viable source of income - Sustainable rural development - Agricultural diversification - Giving farmers a new skill 			
Immediate Objective	Improved livelihood of rural farmers through beekeeping	<ul style="list-style-type: none"> - Additional income - At least \$1,000 by 2013 	<ul style="list-style-type: none"> - Interview - statistics of sold items 	<ul style="list-style-type: none"> - Good environmental conditions
Outputs	Bee colonies are provided	<ul style="list-style-type: none"> - Delivery of 8 colonies - Delivery by April 2012 	<ul style="list-style-type: none"> - Filed visit 	<ul style="list-style-type: none"> - Stability in weather - Swarming on time
	The concept of beekeepers' network is initiated	<ul style="list-style-type: none"> - The concept is starting to evolve 	<ul style="list-style-type: none"> - Interviews with beekeepers 	<ul style="list-style-type: none"> - Availability of beekeepers around
	Technical and marketing trainings are conducted regularly	<ul style="list-style-type: none"> - Number of trainings - Number of attendees - Level of understanding 	<ul style="list-style-type: none"> - Training report - Interview - Test ability to train 	<ul style="list-style-type: none"> - Expert's availability
	Learning material is provided	<ul style="list-style-type: none"> - Availability of learning material with beekeeper 	<ul style="list-style-type: none"> - Meetings 	<ul style="list-style-type: none"> - Availability of material
	Required tools, equipment, and preventive care are offered	<ul style="list-style-type: none"> - Availability of material with the beekeeper 	<ul style="list-style-type: none"> - Interview - Site inspection 	<ul style="list-style-type: none"> - Purchase from supplier
	Special discounts for beekeeping are secured	<ul style="list-style-type: none"> - Discount rate offered 	<ul style="list-style-type: none"> - Interview supplier - Interview beekeeper 	<ul style="list-style-type: none"> - Agreement with supplier
Activities	<i>Presented in the action plan</i>			

PROJECT IMPLEMENTATION

IMPLEMENTATION STRATEGY

Selection of family

The project starts with one family identified after a primary selection of several families in various rural regions of the country. The final list included four families in different regions, one from Nabatieh (South Lebanon), another from Dannieh (North Lebanon), and two families from Richmaya and Shheem in the mountains of Lebanon. The selection criterion is explained in Appendix C, with the shortlisted families scoring 22, 21, 28, and 24 respectively.

For the first phase of the project, the family in Richmaya is selected. The family consists of four members, with the father being a farmer for more than 20 years. Their major income comes from farming activities, specifically ground plants, cattle raising, and cultivars, and is estimated to be a net of around \$10,000 per annum.

Michel, the head of the family, tried to raise bees for a couple of years, but failed to maintain his beehives and lost all his bees for unknown diseases.

Action plan

The action items are set based on logical framework matrix prepared and the major capital assets discussed earlier, within each there exist several action items and activities to be implemented.

The action plan includes 10 major components, each with specific actions making a total of 15 activities to be implemented over the project period.

The action items are implemented by EWB-Lebanon in coordination with other partnering organizations.

Except for item A.1.a, this process is repeated for new beneficiaries after getting new bee colonies through artificial and/or natural swarming. For the next phase, farmers are asked to either build their own beehives or buy them from a local supplier.

Table 2: Action plan for the first phase of the project

Capital Asset	Components	Activities
A. Natural Capital	1. Provide bee colonies	<ul style="list-style-type: none"> a. Buy 8 beehives with bee colonies (4 full frames per beehive) b. Delivery beehives to the location
	2. Ensure environmental resources	<ul style="list-style-type: none"> a. Educate beekeepers about the importance of natural farming
B. Social Capital	1. Create beekeepers' network	<ul style="list-style-type: none"> a. Gather beekeepers and professionals in the region
C. Human Capital	1. Technical trainings	<ul style="list-style-type: none"> a. Provide a learning session on beekeeping and honey products b. Conduct a practical training on the basics of beekeeping c. Conduct a training on artificial swarming d. Conduct a training on building and assembly of beehives e. Provide professional support on major diseases
	2. Marketing trainings	<ul style="list-style-type: none"> a. Help the beekeeper market the produced honey
	3. Learning material	<ul style="list-style-type: none"> a. Provide an operation guide in partnership with the expert b. Provide guides on diseases and treatment methods
	4. Follow-up and coordination	<ul style="list-style-type: none"> a. Offer help and coordination with the beekeeper for 2 years
D. Physical Capital	1. Provide tools and equipment	<ul style="list-style-type: none"> a. Provide all necessary equipment needed (Appendix D)
	2. Provide preventive care material	<ul style="list-style-type: none"> a. Provide all necessary supplies (Appendix D)
E. Financial Capital	1. Get special discounts for beekeeping	<ul style="list-style-type: none"> a. Secure special discounts for future development

Action plan timeline

The action plan very much depends on the weather conditions and other environmental factors, which might cause some delays and changes in the timeline, but would be in a tolerable range.

The work plan is set annually, and is repeated in similar patterns for the different phases of the project. The timeline expressed below is for phase 1 with one family only. The swarming activity cannot be set in a specific month as this depends on the activity of the bee colony and the weather conditions. When swarming takes place, a month later the process will be repeated for the new family in phase 2.

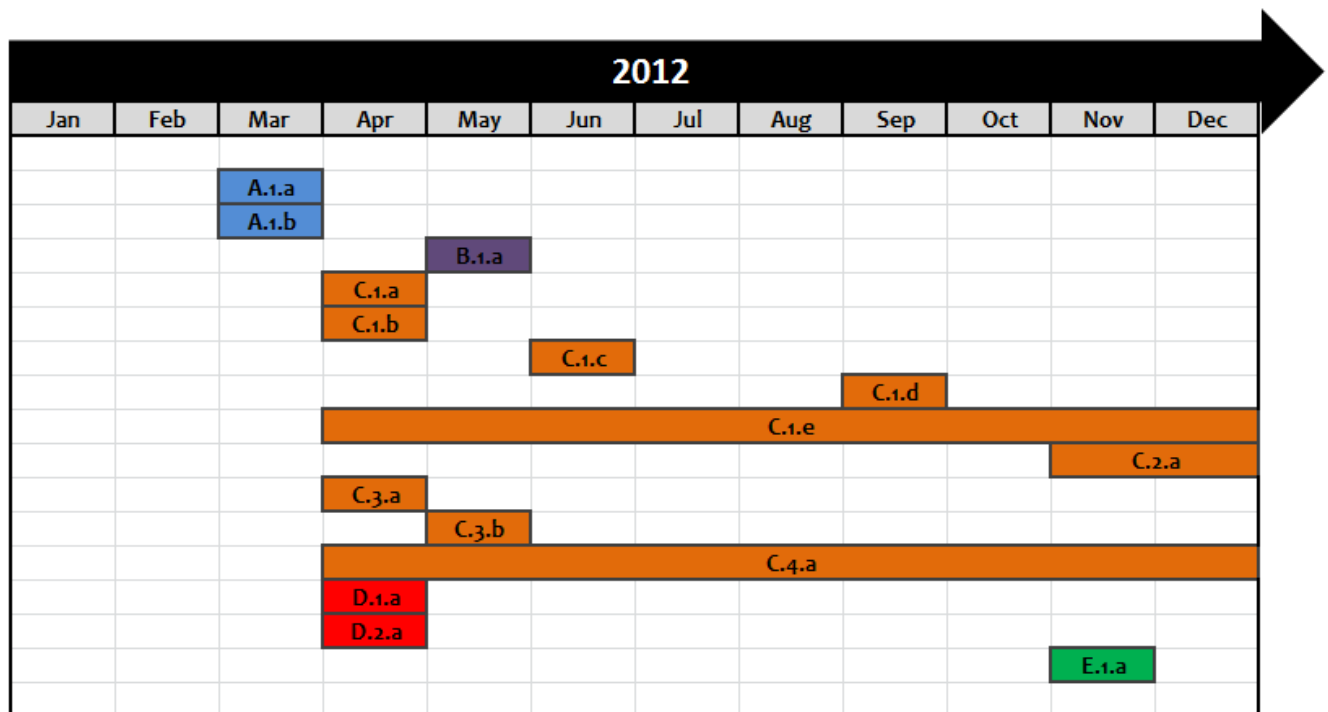


Figure 2: The action plan timeline for phase 1

Coordination and responsibilities

The project implementation is led by a team leader, supported by a project assistant who is developing an expertise in the field of beekeeping. Other volunteers from the team of EWB-Lebanon join the project team to participate in different activities as assigned by the team

leader whose major role is to coordinate among the different key players of the project. he plays the role of the focal point and the manager of the activities planned and undertaken.

Table 3: Responsibility Matrix

Activity	Responsible Staff	Implementing Partner
Buy 8 beehives with bee colonies	Project Leader Project Assistant	Eiffel
Delivery beehives to the location	Project Leader Project Assistant	Green Arms
Educate beekeepers about the importance of natural farming	Project Assistant Beekeeping Expert	Eiffel
Gather beekeepers and professionals in the region	Project Leader Beneficiary	Green Arms
Provide a learning session on beekeeping and honey products	Project Leader Project Assistant Beekeeping Expert	Eiffel
Conduct a practical training on the basics of beekeeping	Project Assistant Beekeeping Expert	Eiffel
Conduct a training on artificial swarming	Beekeeping Expert	Eiffel
Conduct a training on building and assembly of beehives	Project Leader Project Assistant	
Provide professional support on major diseases	Project Assistant Beekeeping Expert	Eiffel
Help the beekeeper market the produced honey	Project Team	Eiffel
Provide an operation guide in partnership with the expert	Project Leader Project Assistant Beekeeping Expert	Eiffel
Provide guides on diseases and treatment methods	Project Assistant	Eiffel
Offer help and coordination with the beekeeper for 2 years	Project Leader Project Assistant Beekeeping Expert	Eiffel
Provide all necessary equipment needed	Project Leader Project Assistant	Eiffel
Provide all necessary supplies	Project Leader Project Assistant	Eiffel
Secure special discounts for future development	Project Leader	Eiffel

FINANCING

Budget

The major expenses of the project are the bee colonies and the equipment needed including suits and beehives. Training sessions and capacity building are provided free of charge by a partner organization for the first phase of the project. For other phases the participants of the previous training sessions would be training new beekeepers in coordination with the experts hired by the partner organization. This would ensure sustainability of the transfer of know-how, and help create strong links between beneficiaries.

No administrative costs are claimed as the project team is participating on voluntary basis, and members are committed to the implementation of the project with no financial returns.

The budget set for this project over three phases is \$3,553 as described in details in Table 4.

Table 4: Budget of the project over the three phases

Item	Unit	Quantity				Unit Price	Total Price
		Phase 1	Phase 2	Phase 3	Total		
Beehives + Bees	hive	8	0	0	8	\$120.0	\$960.0
Beekeeper's Suit	pc	4	2	2	8	\$60.0	\$480.0
Smoker	pc	1	1	1	3	\$12.0	\$36.0
Hive Tool	pc	1	1	1	3	\$4.0	\$12.0
Feeder (8 liters)	pc	2	2	2	6	\$13.0	\$78.0
Brush	pc	1	1	1	3	\$4.5	\$13.5
Vitamins	1 liter	1	1	1	3	\$13.0	\$39.0
Proteins	1 liter	1	1	1	3	\$13.0	\$39.0
Feed	Box (12)	2	2	2	6	\$32.0	\$192.0
Anesthetic	Box	1	1	1	3	\$4.5	\$13.5
Anti-Varroa	pc	16	16	16	48	\$5.0	\$240.0
Anti-Swarming	box	1	1	1	3	\$10.0	\$30.0
Swarming Tools	box	0	8	0	8	\$20.0	\$160.0
Hornets Trap	pc	2	2	2	6	\$10.0	\$60.0
Transportation	-	10	10	10	30	\$30.0	\$900.0
Miscellaneous	-	1	1	1	3	\$100.0	\$300.0
						Total	\$ 3,553.0

Partners

During the first phase, EWB-Lebanon has two major partners that financially and technically contributed to the implementation of the project. For the other two phases, the implementation committee at EWB-Lebanon would be looking for new donors interested in participating and helping this project.

The partners' kind contributions were sufficient to ensure successful implementation of the first phase of the project. The major partners during the first phase of the project are Green Arms and Eiffel Association for Beekeeping.

Green Arms is a Lebanese association involved in sustainability projects and environmental friendly activities. Bernard Ammoun, the CEO of Green arms, contributed with an amount of \$1,200 to partially finance the first phase of the project.

Eiffel Association for Beekeeping is a leading beekeeping association supplying beekeeping equipment and material and offering apiculture consultancy in Lebanon and the Middle East. It is recognized as a major producer of beekeeping food supplies. Eiffel Association for Beekeeping provided an in-kind contribution by offering their expertise and knowledge through training sessions, and offering EWB-Lebanon special discounts on the product purchased for the benefit of this project.

Table 5: Financing of the project in its three phases

Item	Type	Quantity			Total Price
		Phase 1	Phase 2	Phase 3	
Green Arms	Cash	\$1,200	\$0	\$0	\$1,200.0
EWB-Lebanon	Cash	\$500	\$0	\$0	\$500.0
	In-kind	\$200	\$200	\$200	\$600.0
Eiffel Association	In-kind	\$200	\$200	\$200	\$600.0
Donor 2	Cash	\$0	\$750	\$0	\$750.0
Donor 3	Cash	\$0	\$0	\$750	\$750.0
Total					\$4,400.0

FEASIBILITY ANALYSIS

From the beekeeper's point of view, beekeeping is by far one of the most feasible activities in terms of finance. A beehive would cost around \$150 a year (including running costs), but would generate an income that could exceed this investment.

There are two type of income generating possibilities, the first from selling bee colonies that are naturally reborn (swarming) an average of once a year. A bee colony is sold at an average of \$80 at the current rates.

The other source of income would be the sale of honey, which is currently rated at \$20 per kg. With an average honey production yield of 8 kg/beehive, a single colony would generate an income of \$160 per year.

The project being implemented would eliminate the first source of income for the first two years, as new colonies would be used for other projects, and thus the income generation for the whole period of the project would be \$2,560.

IMPLEMENTATION ACHIEVEMENTS

Up to the date this report is issued, the project team has successfully implemented the following activities:

Selection of the beneficiary (November 2011 – February 2012)

The planning of the project started by the end of 2011, the selection of the beneficiary was done by January 2012, after paying visits and conducting interviews with the potential beneficiaries.

Several meetings were conducted with the beneficiary to explain the project and define the commitments of each party.

Fundraising (February – February 2012)

The project was presented to several potential donors including environmental organizations, farmers' associations, private companies, and individuals. Negotiations started with the CEO of green arms in February 2012 and were continued with a more solid proposal in March 2012, when the company decided to contribute with an amount of \$1,000 to the project. At a later stage the contribution was increased to \$1,200 paid in cash.



Purchase of equipment (March – April 2012)

There are only a few suppliers of beekeeping equipment in Lebanon, on top of which is Eiffel Association for Beekeeping, which is considered a leading company in supplying material and food supplies, as well as bee colonies of high quality.

The managing director of Eiffel Association, decided to provide a special discount of 10% to all equipment purchased for the benefit of this development project. In addition, the association offered one of its best experts, Mr. Ahmad Kassar, to lead training sessions and provide technical expertise.

Delivery of equipment (April 2012)

On the night of April 18, 2012, eight beehives and related equipment were delivered to the site. Mr. Michel El Hachem was available to receive the beehives and place them on the special rack built for this purpose.

The rest of the equipment was delivered during the first training day on April 22, 2012.



Training on the basics of beekeeping (April 2012)

On the 22nd of April, a training session on the basics of beekeeping was conducted in Richmaya. The training was given by an expert from Eiffel Association for beekeeping and attended by 15 participants including the farmer and his family, in addition to other potential beneficiaries, a group from the main partner, and project participants from EWB-Lebanon.



The training was preceded by a theoretical session given by the beekeeping expert at EWB-Lebanon about the bee colony and the different types of bees.

Beekeeper's operation manual (April 2012)

A manual for good beekeeping practices was prepared by EWB-Lebanon team with the support from the beekeeping of the partnering association. The leaflet manual provided guidelines for the beekeeper to better manage his beehives. (See Appendix E)



MONITORING AND EVALUATION SYSTEM

MONITORING

In order to ensure the project is going on track and guarantee that various activities are undertaken as specified in the plan, first level monitoring is performed by the organization's staff who routinely gather information on all aspects of the project and arrange field visits to make sure the implementation of the project is going by the commitments set during the initiation of the activity.

Project staff conduct weekly visits during the first month of the implementation (May 2012), and to discuss with the beekeeper the progress and the problems faced if any.

Starting June, the frequency of inspection visits would be reduced to then become once a month. Monitoring reports are prepared by the project team upon each visit conducted.

The monitoring report includes the activities that need to be monitored, with the deadlines and due times set for each activity. It also includes the current progress and the steps taken up to date, presenting the barriers faced and the solutions that have been proven to be effective.

EVALUATION

The evaluation criterion for the implemented development project includes process and impact evaluation.

Process evaluation is done at the end of the first year of the project to review goals, strategies, and work plans, based on which modifications and improvements are implemented through a constructive re-planning process.

Impact evaluation is performed at the end of the project to investigate whether or not the project has achieved its goals and attempts. It looks at the impact of the project and its effect on the beneficiaries and participants through sustainable development. This is done through data collection, surveys, interviews, and cost-benefit analysis at the beneficiary's level.

The evaluation process for this project includes 6 major steps as shown in Table 6.

Table 6: The major steps of project evaluation

Purpose of evaluation	<p>The evaluation is done to investigate the effectiveness and applicability of the project.</p> <p>It is done for EWB-Lebanon personal use, and can be shared with the donors and partnering agencies.</p>
Priority areas	<ul style="list-style-type: none"> - Feasibility of the project - Sustainability of the activity - Impact on the beneficiary - Development of technical knowledge - Effect on rural development
Information collection	<ul style="list-style-type: none"> - Surveys - Interviews with the beneficiary - Inspection visits - Testing the technical knowledge development at the beneficiary level - Calculation income contribution
Implementation plan	<p>Evaluation committee: Project leader and project assistant from EWB-Lebanon</p> <p>Budget: \$0 (Done on voluntary basis)</p>
Information analysis	<p>The evaluation committee presents the results to the project committee, where the decision pertaining to the impact and performance of this project shall be made.</p>
Follow up	<ul style="list-style-type: none"> - Project committee meeting to discuss the results and analyze the barriers - Meeting with the beneficiary to understand the major issues - Communicating finding to other involved parties - Reporting the lessons learnt

CONCLUSION

CHALLENGES

The project is still in its beginning, yet it encountered various challenges and barriers, mainly causing frequent adjustments to the timeline of the project. The project team's major challenge was to ensure an appropriate balance between the environmental conditions and the project requirements.

A delay was caused due to the instability of weather conditions that led to a delay in the birth of new colonies. In addition, the selection of the first beneficiary was a time consuming process, with high risk due to the difficulty of fully understanding the situation prior to implementation.

On another note, the fact that all these activities were done on voluntary basis, the work witnessed some delays due to other commitments of the team members especially with the frequent modifications in the time plan. Some members had already planned for other professional activities and had to hand in their duties to other members in an aim to keep the project going on.

SUSTAINABILITY OF THE PROJECT

The project success depends on the sustainability it can achieve, which depends on the proper implementation of the various components of the project.

By the end of the first year, the beekeeper is expected to be knowledgeable enough to offer his earned expertise in the training sessions of the following stages of the project. The know-how learned through training and practical experience should be an important asset for the beekeeper and the project itself.

Similarly, the project aims to achieve sustainability in the social, financial, institutional, and environmental aspects.

Being properly implemented, the project is expected to sustainably improve working conditions and social protection through offering diversification in agricultural activities and keeping close coordination throughout the implementation.

The financial sustainability of the project is to be achieved through the collection of new colonies, and the minor contributions of the beneficiaries in buying or building their own beehives. Additional funds are to be secured, and sources of revenue will be considered during the second year of the project.

At the institutional level, the agreement with the beekeepers to give them full ownership of the bee colonies under the condition of providing swarming bees for two years ensures institutional sustainability.

Last but not least, environmental sustainability has the biggest share due to the important role bees play in the pollination of plants and the growth of natural resources. As a matter of fact, the loss of bees has serious consequences for plants, wildlife and, yes, human survival, and their collapse threatens global food security

And as Einstein once opined, “If the bee disappears from the surface of the earth, man would have no more than four years to live. No more bees, no more pollination ... no more men!”

APPENDICES

Appendix A: The Survey Questionnaire

Surveyor:	Date:
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General Information	
Name:	Age:
Village:	Phone Number:
Classification: <input type="checkbox"/> Rural Inhabitant <input type="checkbox"/> Farmer <input type="checkbox"/> Beekeeper <input type="checkbox"/> Supplier <input type="checkbox"/> Expert	

For those with no previous beekeeping experience	
Would you be interested in beekeeping? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Why? [_____]	
How many beehives can you handle?	[_____]
What would you need to become a beekeeper? [_____]	
How many natural swarming did you have per year? [_____]	
What are the major reasons stopping you from considering beekeeping? <i>(Give a rating On a scale of 1 to 5, with 1 being least and 5 being highest priority)</i>	
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤

Do you have a good land for beekeeping?

- Yes
- No

Is there any use of agricultural pesticides near the location?

- Yes
- No

Would you be interested in becoming a beekeeper?

- Definitely yes
- Yes
- Not sure
- No
- Of course not

Would you consider it if we offer you financial and technical support?

- Definitely yes
- Yes
- Not sure
- No

For those with previous beekeeping experience

Are you still a beekeeper?

- Yes
- No

How long have you been a beekeeper?

[_____]

Why did you stop?

[_____]

How many beehives did/do you have?

[_____]

What is the honey production yield?

[_____]

How many natural swarming did you have per year?

[_____]

What are the major problems you face(d) in beekeeping?

(Give a rating On a scale of 1 to 5, with 1 being least and 5 being highest priority)

[_____]

① ② ③ ④ ⑤

[_____]

① ② ③ ④ ⑤

[_____]

① ② ③ ④ ⑤

[_____]

① ② ③ ④ ⑤

[_____]

① ② ③ ④ ⑤

What do you think should be improved to enhance beekeeping activities?

(Give a rating On a scale of 1 to 5, with 1 being least and 5 being highest priority)

[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤
[_____]	① ② ③ ④ ⑤

Do you have a good land for beekeeping?

- Yes
- No

Is there any use of agricultural pesticides near the location?

- Yes
- No

Would you be interested in getting back to beekeeping?

- Definitely yes
- Yes
- Not sure
- No
- Of course not

Would you consider it if we offer you financial and technical support?

- Definitely yes
- Yes
- Not sure
- No

Appendix B: Results of Survey: Major obstacles and problems

On a scale of 1 to 5, with 1 being least and 5 being highest priority

	Rural Inhabitants	Farmers	Overall
Insufficient income	5	3	4
Lack of governmental support and concern	4	4	4
Lack of diversified resources	3	5	4
Instability of income	4	4	4
No guarantees for new products	3	4	3.5
No market for the products	3	5	4
Continuous crop damage	4	5	4.5

	Beekeepers	Experts & Suppliers	Overall
Diseases attacking bees	5	4	4.5
Low return on investment	5	2	3.5
No sufficient technical skills	4	5	4.5
Expensive tools and equipment	5	4	4.5
No governmental support	4	4	4
No enough guidance	4	4	4
Use of traditional beekeeping techniques	2	5	3.5
No enough market for their products	4	3	3.5
Use of pesticides by farmers	5	4	4.5

Appendix C: Selection Criteria of the Family

On a scale of 1 to 5, with 1 being least and 5 being highest priority

	Family 1: Nabatieh	Family 2: Dannieh	Family 3: Richmaya	Family 4: Shheem
Disadvantaged situation	3	5	4	2
Availability of nectar-rich land	4	5	5	4
No use of pesticides	5	1	5	4
Previous experience in beekeeping	2	1	5	4
No presence of bees close to the location	4	5	4	5
Willingness to share experience	4	4	5	5
Overall	22	21	28	24

Appendix D: List of material needed for phase 1

Material	Quantity
Beekeeping Suit	4
Smoker	1
Hive tool	1
Brush	1
Feeder (8 liters)	2
Beehives	8
Hornets Trap	2

Material	Quantity
Vitamins (1 liter)	1
Proteins (1 liter)	1
Feed (1 kg)	24
Anti Varroa	16
Anesthetic (1 kg)	1
Swarming treatment	1



دليل النحال للإهتمام بالنحل



مبتروع تربية النحل
للحد من الفقر وتنمية
المدينة الريفية
المستدامة

نقل النحل

- ✦ تتم عملية نقل النحل من مكان إلى آخر بعد غروب الشمس لضمان إكمال الخلية
- ✦ بعد إكمال الخلية يتم غلق المدخل بالسيف أو أية مادة أخرى
- ✦ يتم نقل النحل بحذر إلى الموقع الجديد
- ✦ عند الوصول يتم تحضير الغذاء الخاص ووضعه داخل المشربيات الخاصة
- ✦ بعد ذلك يقف النحال خلف الخلية ويسحب السداد بحذر شديد
- ✦ في اليوم التالي، يقوم النحال بفرز البراويز ووضعهما بالترتيب من الأكثر إمتلاءً للأقل

إختيار الموقع

- ✦ يجب إختيار موقع غني بالنباتات الرحيقية ويبعد عن الأطفال
- ✦ يجب وضع الخلايا بمواجهة الجنوب مع إمكانية انحراف باتجاه الشرق
- ✦ يجب عدم حجب الشمس عن الخلايا لتجنب أمراض التعفن داخل الخلايا
- ✦ يجب ترك مسافة لا تشوبها شوائب عند مدخل الخلايا

أدوات النحال



- ✦ بدلة النحال
- لونها أبيض، قماشها سميك، بقناح مشبك للوقاية من لسعات الوجه، وقفاز جلدي يصل للمرفق



- ✦ المنفخ
- يستعمل المنفخ لتهديئة النحل قبل البدء بعملية الكشف بشكل خفيف كي لا يتسبب بهياج النحل
- لتشغيل المنفخ يتم حرق خيش نظيف مع المخدر الخاص.



- ✦ العتلة:
- قطعة معدنية حادة من أحد أطرافها لكشط الشمع الزائد ومادة البروبوليس في حال وجوده
- هي مثبتة من الطرف تستعمل لسحب البراويز وإزالة الشرائق الغير مرحب بها



- ✦ فرشاة النحل
- تستخدم لإبعاد النحل عن البراويز أثناء رفعها للفحص أو قطف العسل لتجنب هرس النحل.

الكشف الدوري

- ✦ يجب الكشف على النحل أسبوعياً في فصل الربيع، كل عشرة أيام في الصيف، و شهرياً في الشتاء.
- ✦ الوقت الأمثل لعملية الكشف من شروق الشمس حتى الساعة التاسعة صباحاً في فصلي الصيف والربيع، وبين الساعة العاشرة والثالثة بعد الظهر في فصل الشتاء حيث يكون معظم النحل سارحاً لجمع الرحيق وحبوب اللقاح
- ✦ يتم الكشف على التالي:
 - أي تصرف غريب لدى النحل
 - أي شرنقة لتفريخ الملكات
 - أي وجود لحشرات دخيلة كالقروا
 - أي إنتشار غير عادي لذكور النحل
- ✦ طريقة الكشف:
 - يتم الكشف على كل قفير على حداً
 - يجب عدم توجيه الضوء على الخلايا فالنحل يقوم بمهاجمة الضوء
 - يجب إمساك البراويز بروية دون المساس بالعيون السداسية

تغذية النحل

- ✦ لتأمين الغذاء المناسب للنحل تحضيراً لموسم جني الرحيق، يجب تحضير خلطة خاصة يتم وقف العمل بها قبيل بدء الموسم
- ✦ يتم تحضير الغذاء على الشكل التالي (لكل ٥ خلايا لمدة أسبوع):
 - ٦ ليتر من الماء
 - ٣ كغ من الغذاء
 - نصف كوب صغير من الفيتامين
 - نصف كوب صغير من البروتين
- ✦ يوضع الخليط داخل المشربيات والتي يتم وضعها بالخارج إن لم يكن هناك نحل بالجوار، أو تمتد لداخل الخلية إن وجد نحل قريب



إجراءات وقائية

- ✦ إستعمال حاجز الملكات لتجنب ولادة ملكات بغير وقتها
- ✦ إستعمال صفائح الفروا لمدة ٦ أسابيع وبمعدل صفيحتين لكل ٥ براويز ممثلة
- ✦ تنظيف الإطارات والخلية من قطع الشمع الزائدة ومادة البروبوليس باستعمال العتلة
- ✦ التأكد من وجود الغذاء الكافي للطائفة من العسل وحبوب اللقاح
- ✦ التأكد من عدم وجود خلل في الرطوبة والحرارة والتهوية على مدار العام
- ✦ تمييز الخلايا بألوان وأشكال مختلفة للحد من ظاهرة النحل التائه
- ✦ التأكد من عدم وجود شقوق في الجسم الخشبي للخلية، ومطابق للمواصفات المعتمدة محليا
- ✦ تعقيم القفازات والعتلة وفرشاة النحل وملابس النحال بصورة دورية

نصائح عامة

- ✦ إزالة وتبديل البراويز القديمة التي يزيد عمرها عن ثلاثة سنوات
- ✦ الامتناع عن فتح الخلية أثناء تندي أو ارتفاع درجات الحرارة أو الرياح الشديدة
- ✦ عدم وضع المعطرات قبل عملية الكشف لتجنب هيجان النحل
- ✦ غسل ملابس النحال دورياً لتجنب تكديس بقايا السكريات مما يجذب النحل
- ✦ عدم القيام بأي حركات سريعة كالتلويح باليدين فذلك يهيج النحل
- ✦ عدم التدخين بجانب النحل

حالات الطوارئ

- ✦ غالباً ما تسبب لسعة النحل ألماً وضيقاً بسيطاً، ولكنها قد تسبب رد فعل حساساً أحياناً
- ✦ في حال التعرض للسعة نحلة يجب القيام بالتالي:
 - إزالة العقوص بالحك لا الفرک
 - من ثم فرك مكان اللسعة بالثوم
- ✦ في حال التعرض لأكثر من لسعة بأماكن حساسة يجب التوجه مباشرة لأقرب مركز صحي
- ✦ إذا أصبح مكان اللسعة منتفخاً، ولونها أحمر، ومؤلمة جداً، فقد يعني هذا وجود حساسية، مما يحتم زيارة الطبيب
- ✦ أبرز عوارض الحساسية من لسعة النحل هي السعال، صعوبة التنفس، التقيؤ، الغثيان، الدوخة، الإغماء، والقلق

الإتصال بنا

- ✦ في حال ملاحظة أي مرض أو عارض غير طبيعي يجب التواصل معنا على الأرقام التالية:

● نادر: ٧٠ ١٥٣١١٩

● جويل: ٠٣ ٢٤٨٣٤٤