Economic and Social Commission for Western Asia

The Water-Energy-Food Nexus Approach for Rural Development: the role of small-scale renewable energy technologies and gender empowerment

Webinar : Thursday, 22nd October 2020

Regional Initiative for Promoting Small-Scale Renewable Energy Applications in Rural Areas of the Arab Region (REGEND)- Lebanon Intervention from a Nexus Approach

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Shared Prosperity Dignified Life

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Rural Indicators

Rural Population	12% of Lebanon's population is estimated to be rural
Active Population	Rural population accounts for an estimated 20-25% of the active population
Poverty	Poverty is dominant in the rural areas of Akkar, North, South, Bekaa and Baalbek-Hermel Rural poor are mostly small farmers, wage labourers, fishermen, and women heads of households The most remote rural areas are characterized by low-income levels
Main Productive Activity	Agriculture, with its related subsectors Agriculture is either the sole source of income or an additional source of income for the majority of the Lebanese rural population
Women Activity	A study found that in 48% of surveyed Lebanese villages, the primary activity of women is in the agricultural sector, followed by education

The complexity and inter-linkages of rural natural resources

- Succeeding governments have not identified a sustainable strategy to develop rural areas, especially the most underprivileged.
- Productive activities suffer from poor government support, fragmented sectors, lack of technological improvements, and high production and operating costs.
- Lebanon is witnessing increased water stress. The water shortage is exacerbated by several factors, including increased population and demand, effects of climate change and water pollution.
- Rapid urbanization and changes in land use led to large share of productive land being degraded. These factors, along with climate change, are threat multipliers to soil erosion. It is estimated that 50 per cent of the territory is highly susceptible to future desertification.
- Food security is threatened by climate change, and the agriculture sector is constrained by energy and water resources and land availability.
- The unreliable electricity supply is a common barrier for improvement in productive sectors.
- Agriculture sector, main productive activity, is dominated by traditional methods and barely benefits from new technologies in its value chains.
    - High energy prices impact on production costs
    - The sector consumer 64 per cent of the available water supply
    - Inefficient flood irrigation accounts for 50-70 per cent of irrigation mediums

Electricity consumption in agriculture and traditional water irrigation

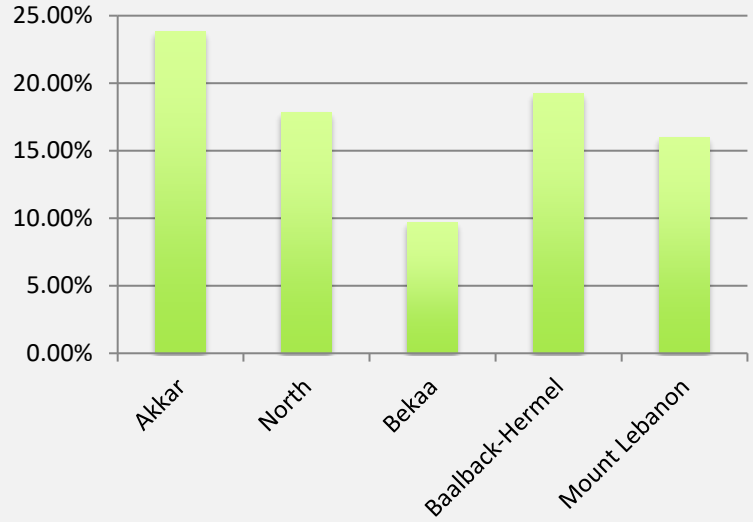
Barriers to rural women employment and entrepreneurship

- **Legal barriers:** lack of perceptible laws and policies support women's labor, and existence of discriminatory laws, especially the personal status law, which gives authority to the religious communities to apply their own laws on inheritance, children custody, divorce, etc.

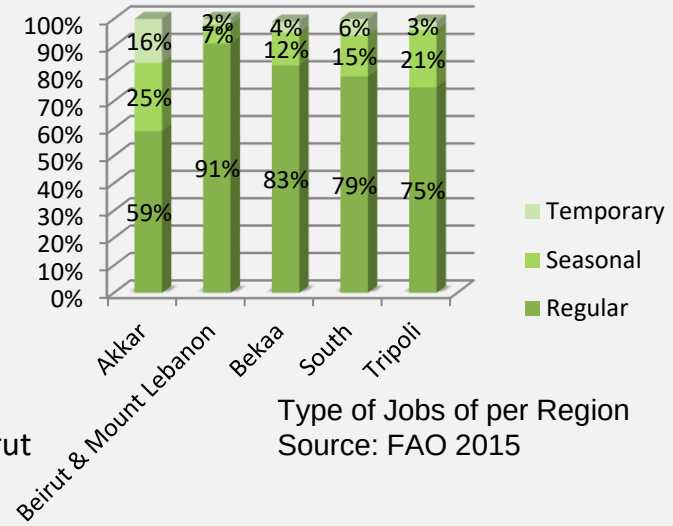
- **Cultural Barriers:** the dominant patriarchal society is a further barrier to rural women's entrepreneurship as they are still viewed as housewives. Entrepreneurship is more common among men than women, whose productive activity is mostly in-house and informal. Entrepreneurship in rural areas is need-based and more common among men than women. There is a lack of management expertise and skill for selling products and growing market share, such as marketing and branding, especially among women.

- **Financial Barriers:** inheritance law in most cases denies women land ownership right, therefore creating further obstacles to securing loans through collateral guarantee. In addition to low banking access, especially in light of Lebanon's economic and financial crises.

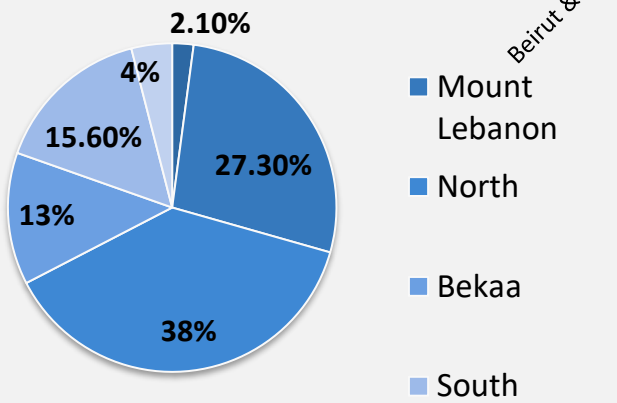
Rural socio-economic characteristics: Low income, high unemployment and small opportunities



Extremely vulnerable households registered with the National Poverty Targeting Programme



Type of Jobs of per Region
Source: FAO 2015



Percentage of poor population by region

Barriers to rural women employment and entrepreneurship

- Growth of micro, small and medium-sized enterprises (MSMEs) across productive sector is necessary to drive the economy.
- Incentives should be provided, focused on decreasing operating and production costs and creating an enabling environment for all businesses, across all regions.
- In rural areas, enhancing MSMEs and cooperatives across agriculture and other productive activity value chains would improve socioeconomic conditions by creating jobs for the most vulnerable.
- Equipping women with the necessary business skills improves their decision-making, enabling them to assume greater roles and responsibilities.

Role of small-scale renewable energy in the food-water-energy nexus in rural areas

1. Rural development	Just development of rural areas Transfer of technology and know-how provides new skills, especially for women, slowing rural to urban migration and retaining citizens
2. Rural economy	In times of worsening economic crisis, the major benefit of small-scale RE is enhancing the rural economy, through enabling job creation and attracting funding and investments
3. Productive activities	Reduction of operating costs, increasing businesses and cooperatives ability to invest in new production lines and employ more local women
4. Energy security	Achieving reliable, high-quality electricity supply through environmentally friendly and affordable solutions Rural areas are the most vulnerable to conflict and crises, and decentralized solutions would achieve a level of autonomy and resilience
5. Water efficiency	Improving irrigation technologies, promoting water conservation and efficient usage
6. Land use	Preservation of land for agriculture, and forests
7. Climate change	Energy, water and land use management technologies leverage the rural natural capital and lead to more productive and resilient communities in the face of climate change Reduction in greenhouse gas emissions

Pillars for the community's identification and selection

Pillars
Relatively vulnerable rural area
Availability of natural resources (agricultural land, springs, rivers, etc.)
Availability of productive activities, with growth potential
Human resources and active population
Infrastructure and ease of access
Active participation of women in the labor force (or potential)
Strong local governance (municipalities)
Low security risk
Active NGOs

Akkar El Atika

Chaqdouf

Challenges to sites implementation

- Lack of updated data and information segregated by region
- Absence of data collection and sharing, combined with lack of trust in government and agencies
- Lack of and electricity consumption monitoring on the buildings level for the proper technology sitting and design
- Lack of roof and/or as-built drawings for the system design
- Poor understanding of the market outside the local level, and lack of marketing skills
- Security and political risk
- Economic and financial crises

Facilitation

Local Facilitating Team
Food and Agriculture Organisation
UNDP- LHSP Project, North Area
Lebanese Agricultural Research Institute (LARI)
Ministry of Agriculture – Aabdeh, Akkar
Lebanese Center for Energy Conservation
Mada Association

Local level: Akkar El Atika
Municipality
Cooperatives

Local level: Chaqdouf
Municipality
Live Akkar NGO

Sites interventions

Village	Project Implementation	Capacity Building
Akkar El Atika	- 25 kWp solar photovoltaic system including lithium-ion battery storage, for the building of three cooperatives. - 200 liters solar water heater - LED lighting retrofit for the women cooperative (that doesn't have efficient light bulbs) and the municipality - Procurement of equipment facilitating the works, including beeswax machinery, pomegranate squeezer and peeler, fridge and cooking gas.	- Managing cooperatives - Entrepreneurship - Marketing - Branding - Operation and maintenance of solar systems - Training on equipment operation to grow current productive activities or develop new ones
Chaqdouf	- 10 kWp solar photovoltaic systems for a sowing factory. - 200 liters solar water heater - LED lighting retrofit - Procurement of new types of sewing machines to extend the work lines and products	- Starting and managing a cooperative - Entrepreneurship - Marketing - Operation and maintenance of solar systems - Training on equipment operation to grow current production lines or develop new ones

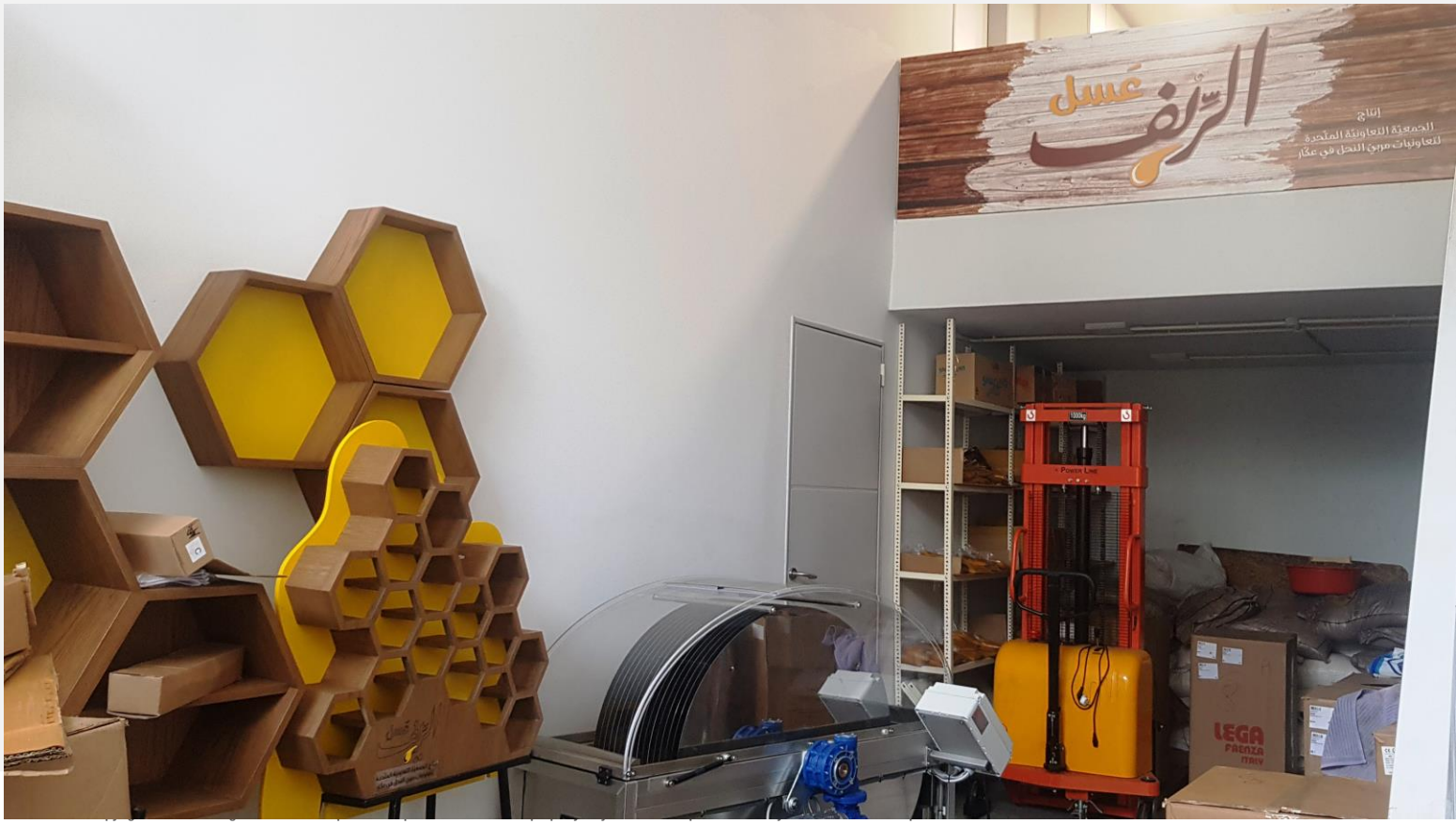
Site Interventions

- Reducing women’s work time
- Improving food production and safety, and

increasing products and revenue streams through new equipment.

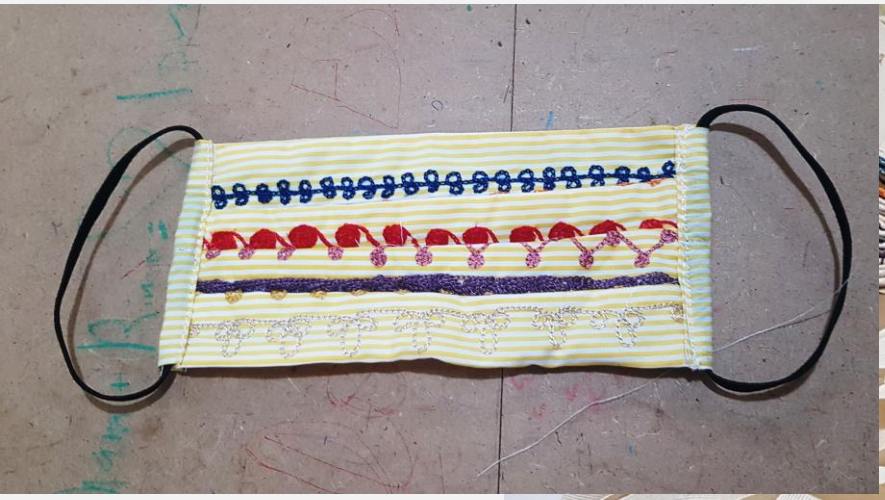
Site Interventions

- Improving bees and wax production, and therefore beekeepers productivity through new equipment.



Site Interventions

- Increasing women’s work efficiency
- Enabling new product lines and revenue streams through new sewing machinery.



Current Status: Evaluation and Contract Award

Phase	Status
Expression of Interest	Completed
Shortlisting of Firms	Completed
Launch of Request for Proposal	Completed
Evaluation	In process
Contract Signature	End of 2020
Project Implementation	Spring 2021
Capacity Building	Spring 2021

Moving Forward

Impact

- Affordable electricity- Reduction of load on weak electricity grid
- Water and energy conservation
- Food safety
- Rural development
- Introduction of new product lines and revenue streams
- Entrepreneurship and management skills
- Gender mainstreaming
- Local governance of energy and water

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Thank you