Economic and Social Commission for Western Asia

Multi-Stakeholders Consultation Meeting on the Water-Energy-Food-Ecosystems Nexus in Lebanon

SESSION 4: Technical WEFE Nexus solutions and their upscaling and financing potential

REGEND: an Integrated Business Model for natural resources management, Climate change and women empowerment

Thursday, 25th August 2022

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Shared Prosperity Dignified Life

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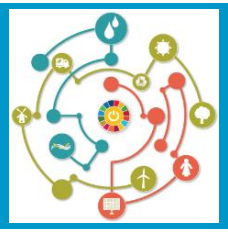
ESCWA Core Functions

To serve as the:

- **Think Tank** of the region – by undertaking innovative research and supporting quality data collection and analysis for evidence-based policy;
- **Advisor** to the region – by providing regional, sub-regional and national capacity building and technical advisory services to member States; and
- **Voice** of the region – by creating regional platforms for deliberation and consensus building that feed global fora and transform the aspirations of Arab citizens into commitments for action.



Sweden
Sverige

Objectives

Improve the livelihood, economic benefits, social inclusion, and gender equality of Arab rural communities by addressing energy poverty, water scarcity, vulnerability to climate change, and other natural resources challenges.

Drivers

Inclusive, sustainable, environmental and economic revival and development of Arab rural communities.

Pillars

Renewable energy technologies	Human capacity	Women's empowerment and social inclusion	Entrepreneurial development	Policy and institutional framework
• Effective and innovative small-scale decentralized and modular renewable energy systems • Water-energy-food nexus • Access to productive resources and appropriate and reliable services	• Model based on know-how • Trainings, knowledge, skills/ advisory services • Improved living standards in resource-poor rural communities through reliable, affordable and modern energy	• Economic power in rural women's hands • Female mentors • Participative and bottom-up approach	• Economic transformation, environmental and socioeconomic development priorities • Entrepreneurial jobs in productive sectors • Spawn energy-based enterprises around renewable energy-based service providers	• Pro-poor investments and private sector involvement • Synergies among national and regional stakeholders • Innovative incentive mechanisms

Cross-cutting

Human rights, gender equality, resilience to climate change

Context

Untapped renewable energy resources, high unemployment, chronic poverty, water scarcity, food insecurity, energy poverty and vulnerability to climate change in rural communities in Arab countries.

REGEND: Key achievements

A total of **31 small-scale renewable energy field projects** and **26 capacity building workshops** were conducted in rural communities in Jordan, Lebanon, and Tunisia.

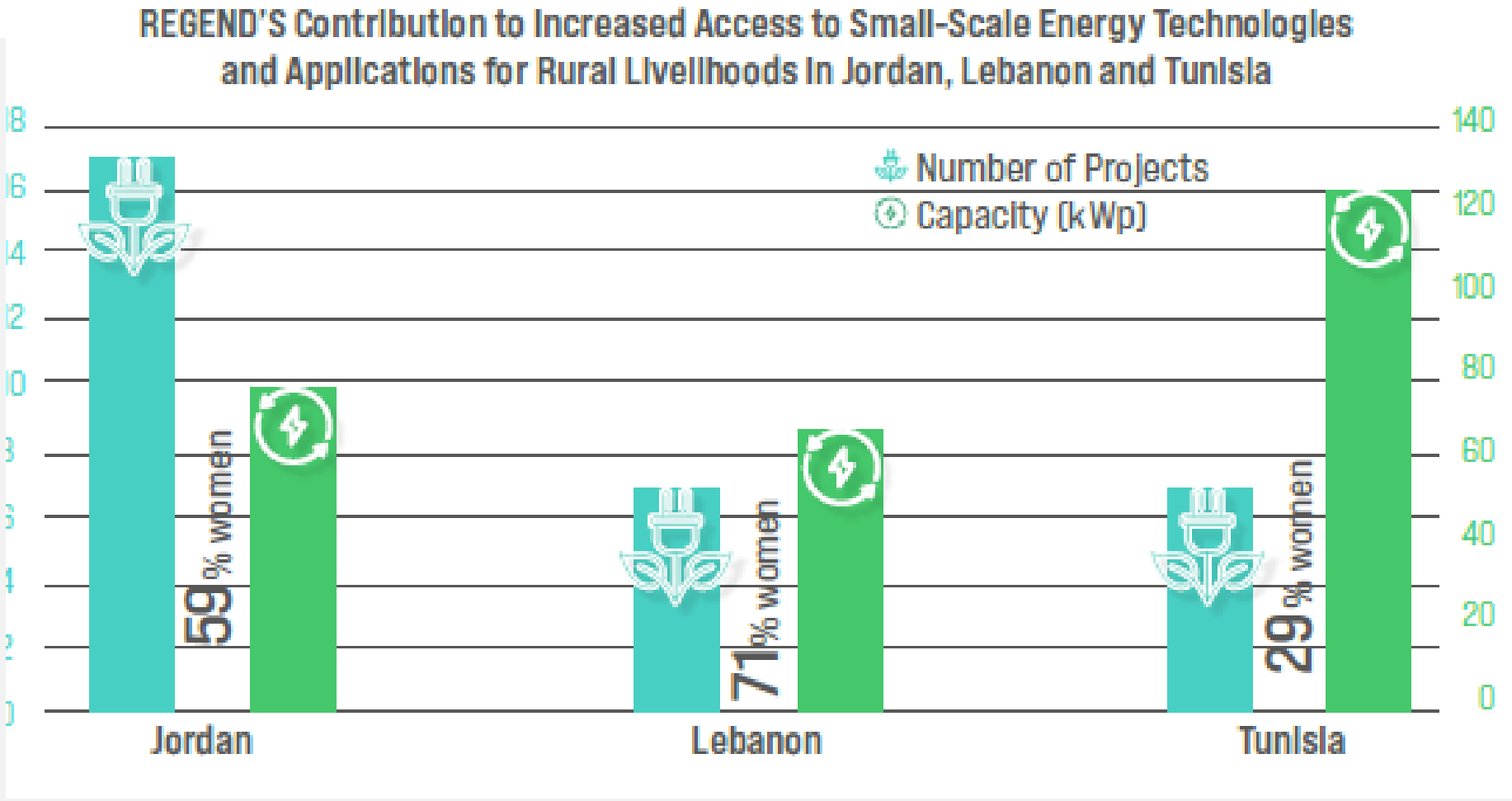
A total of **216 kilowatt-peak** of installed **solar energy capacity** will help eliminate the emission of **3,376 tones of CO_2** over the **25-year** lifetime of the systems.

REGEND helped rural women entrepreneurs and farmers overcome high electricity bills, water scarcity, and poverty by diminishing reliance on state electricity grids, providing efficient irrigation systems, and powering income-generating activities.

REGEND reduced the impact of Lebanon's financial crisis on rural communities by ensuring continuous electricity supply and transferring valuable knowledge.

Macro Level Benefits

Operationalizing the initiative at the country level



REGEND: Field Projects implemented

https://www.unescwa.org/regend

Tunisia

- 6 solar PV projects (122 kilowatt-peak (kWp)
- 7 types of productive equipment

Lebanon

- 2 solar PV projects (35 kWp)
- 2 SWH projects
- 1 LED lighting retrofit project
- 9 types of productive equipment
- 200 Solar Kits for Lightning

Jordan

- 6 solar PV projects (totaling 73 kWp)
- 3 SWH projects
- 2 efficient irrigation projects
- 2 electrical and EE building renovation projects
- 4 types of productive equipment

4.8 kWp 4.8 kWp solar photovoltaic (PV) water pumping system for Ms. Fethia Bougtif's farm in Chorbane, Mahdia, Tunisia.

22 kWp on-grid solar PV system connected to a water drip irrigation system for Mr. Saleh Afash Al-Jazi's farm in Al-Achaari, Maan, Jordan.

25 kWp on-grid solar PV system with a 90-kWh storage capacity and a 200-liter solar water heating (SWH) system for the agro-food and beekeepers cooperatives' building in Akkar Al-Atika, Akkar, Lebanon.

65.5 kWp medium-voltage on-grid solar PV system for the mutual agricultural services company "El-Faouz" in Mahdia, Tunisia.

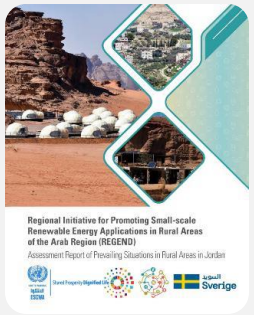
10.4 kWp solar PV water pumping system for Mr. Abdallah Ben Mansour's farm in Chorbane, Mahdia, Tunisia.

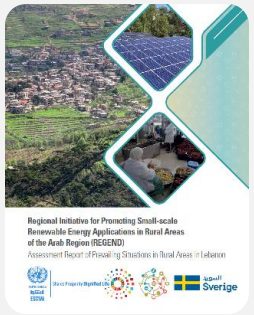
10 kWp on-grid solar PV system with an 18-kWh storage capacity and a 200-liter SWH system for the "Live Akkar" Organization – Sewing and Embroidery Workshop in Chaqdouf, Akkar, Lebanon.

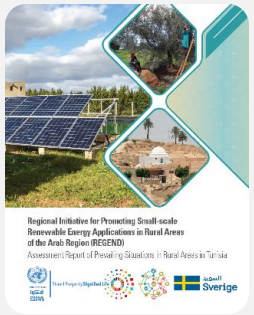
Knowledge Products Development and Dissemination and Sharing Best Practices

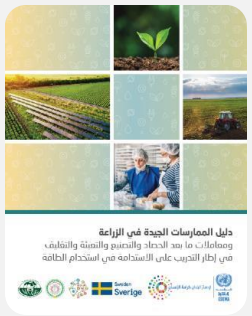
Knowledge Products

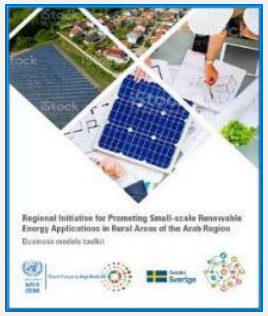
www.unescwa.org/regend

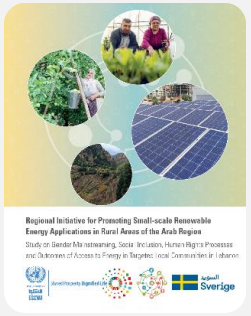


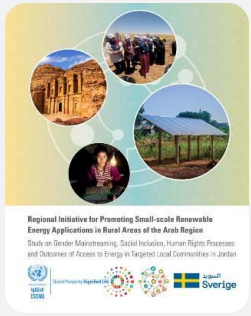


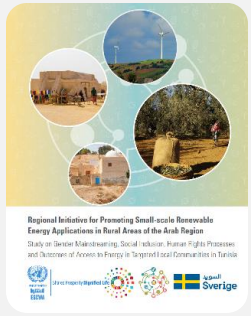


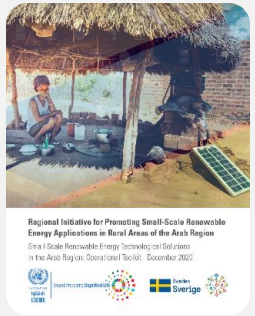


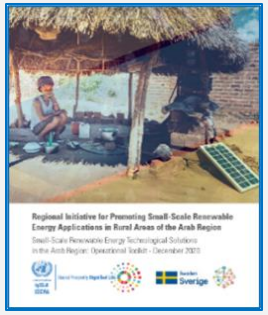


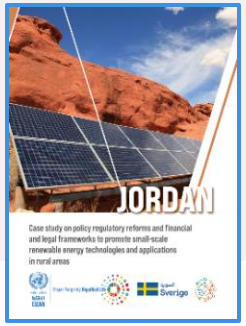


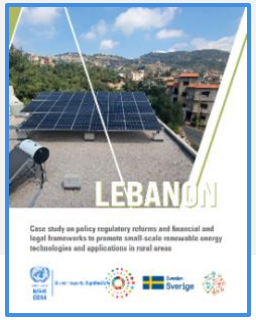


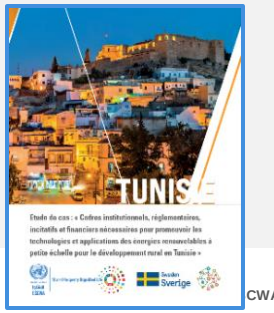


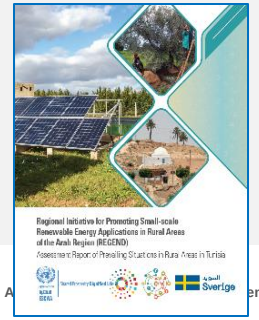






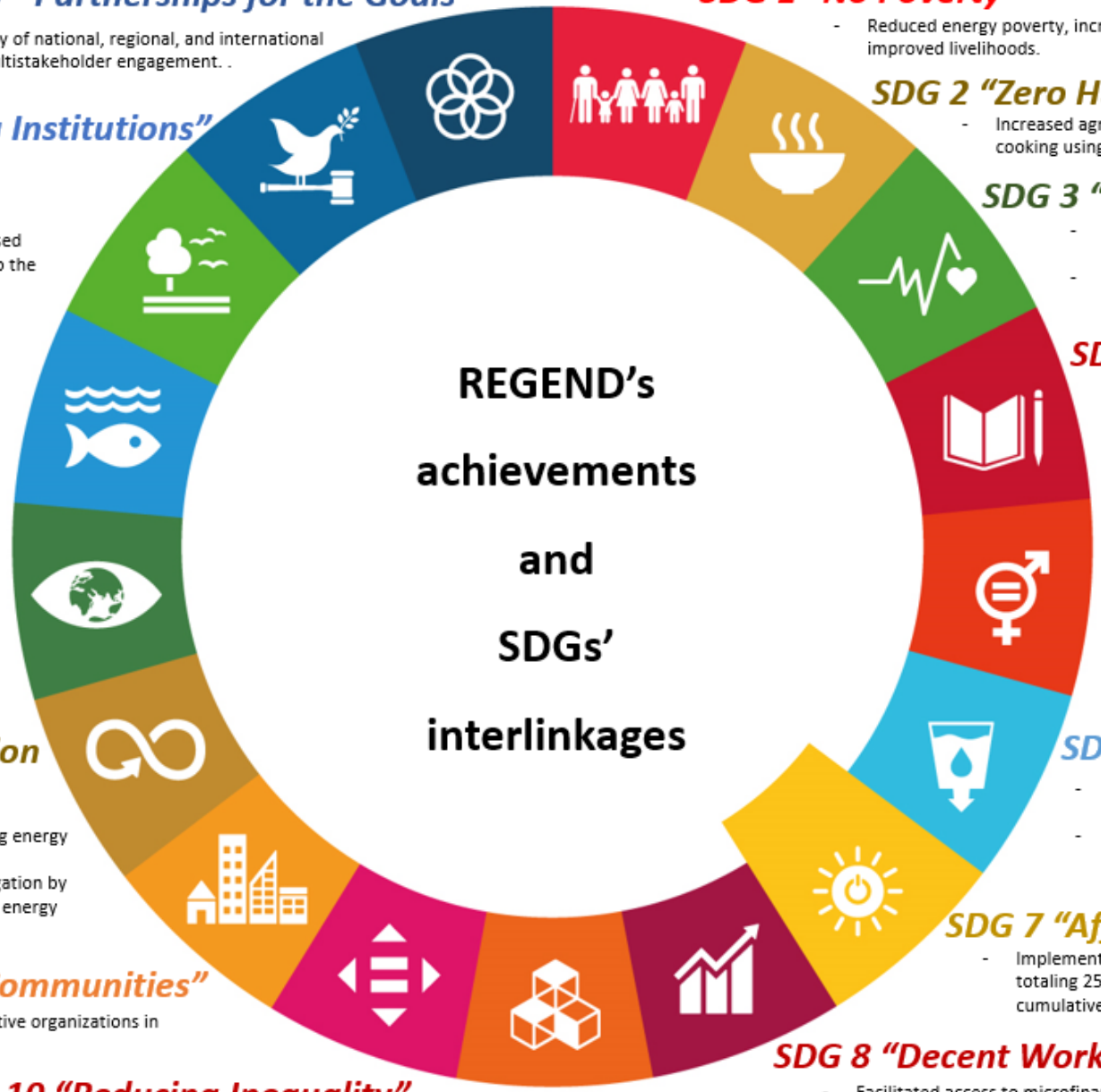






- ✓ REGEND was selected in 2021 as an SDG Good Practice for its capacity-building initiatives
- ✓ REGEND was featured in the United Nations High-Level Dialogue on Energy 2021 Theme Report on Enabling SDGs Through Inclusive, Just Energy Transitions,

ESCWA's partnership on the Gender and Energy Compact developed by the UNIDO, ENERGIA) GWNET)



SDG 17 "Partnerships for the Goals"

- Established a wide variety of national, regional, and international partnerships through multistakeholder engagement. .

SDG 1 "No Poverty"

- Reduced energy poverty, increased productivity and revenue, and improved livelihoods.

SDG 16 "Peace, Justice and Strong Institutions"

- Improved the livelihoods of vulnerable rural people.
- Increased the participation of rural people in energy and sustainable energy decision-making.
- Empowered rural local institutions, such as community-based and cooperative organizations and municipalities, thanks to the implemented projects and capacity-building programs.

SDG 2 "Zero Hunger"

- Increased agricultural and agro-food productivity and revenue and enable clean cooking using renewable energy.

SDG 3 "Good Health and Wellbeing"

- Enabled more affordable health services using energy efficiency and renewable energy.
- Contributed to cleaner air by replacing fossil fuel-based electricity generation with renewable energy.

SDG 4 "Quality Education"

- Built the capacity of rural beneficiaries, through capacity-building programs, on renewable energy, energy efficiency, and a variety of income-generating productive activities.
- Electrified community organizations used for educational purposes with renewable energy and improved them with energy efficiency.

SDG 13 "Climate Action"

- Decreased GHG emissions by 22,097 kg CO_2 for the first year and will decrease GHG emissions by 511,950 kg CO_2 for the 25-year lifetime of the small-scale renewable energy field projects.

SDG 5 "Gender Equality"

- Established a gender-based advisory network that is focused on energy and entrepreneurial skills in rural development by increasing the awareness and understanding of energy needs and small-scale renewable energy technologies with the integration of gender considerations.
- Achieved 87% women beneficiary inclusion in the implemented small-scale renewable energy field projects.

SDG 12 "Responsible Consumption and Production"

- Contributed to reductions in energy intensity by reducing energy consumption and increasing productivity and revenue.
- Contributed to reductions in water consumption for irrigation by implementing drip-irrigation systems coupled with solar energy pumping systems.

SDG 6 "Clean Water and Sanitation"

- Enabled free access to drinking water in rural communities by offsetting utility bills with renewable energy.
- Eliminated the use of diesel and gird electricity for agricultural irrigation by replacing diesel pumps and offsetting utility bills with solar energy pumps.

SDG 11 "Sustainable Cities and Communities"

- Enabled energy efficient community-based and cooperative organizations in rural areas.

SDG 7 "Affordable and clean energy"

- Implemented 31 small-scale renewable energy and energy efficiency field projects totaling 257 kilowatt-peak in five rural communities with a 25-year lifetime cumulative electricity generation of 8,479 megawatt-hour.

SDG 8 "Decent Work and Economic Growth"

- Facilitated access to microfinance for rural women entrepreneurs.
- Improved the working condition for rural farmers and workers through renewable energy, energy efficiency, and productive equipment.

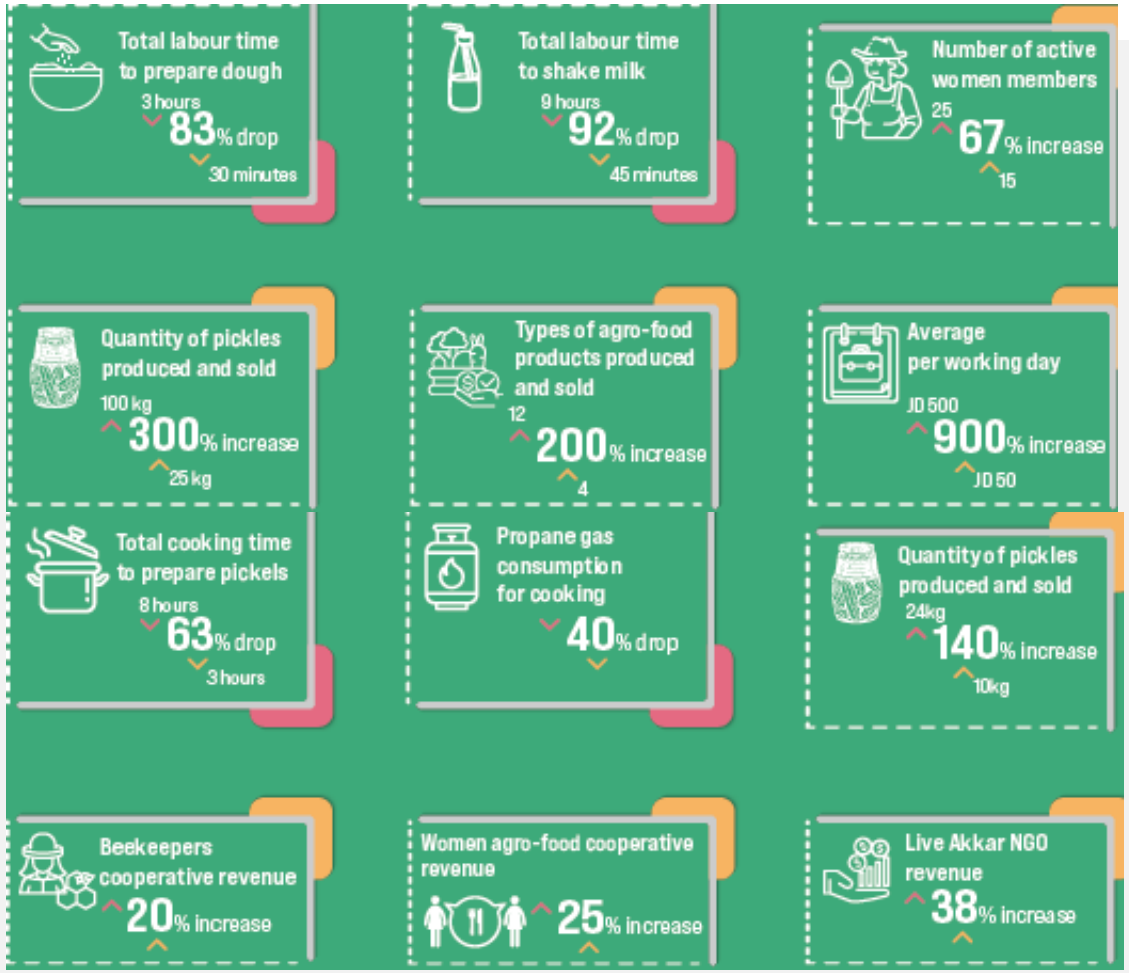
SDG 10 "Reducing Inequality"

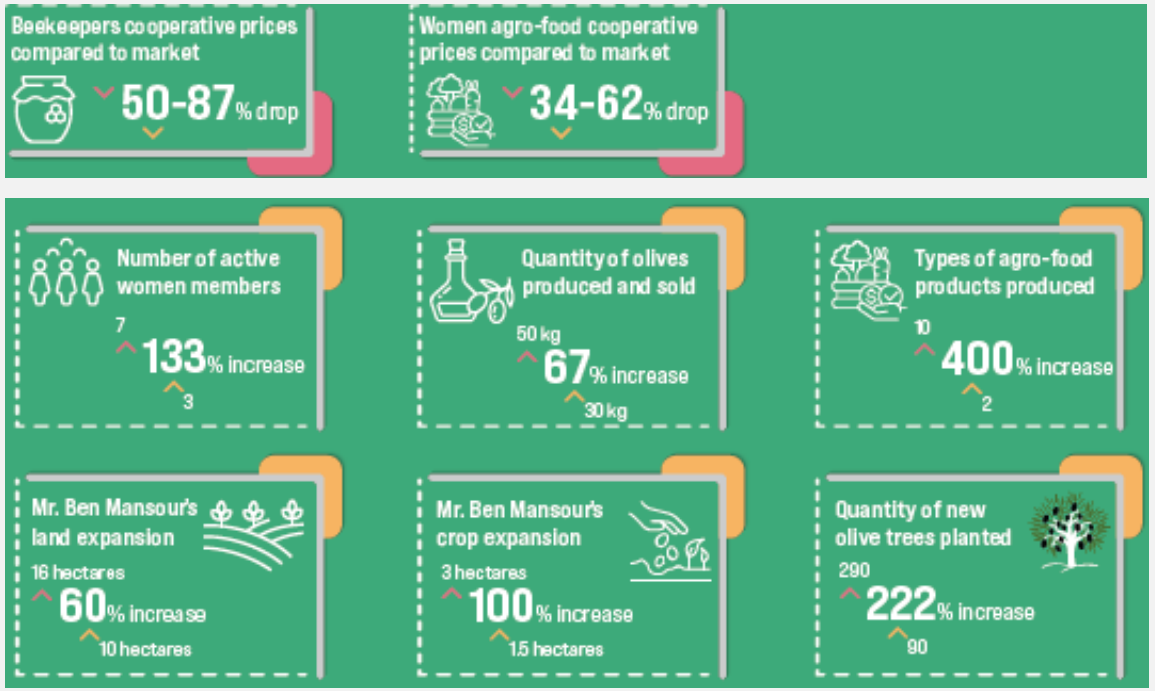
- Contributed to bridging the gap between rural women and men when it comes to energy and sustainable energy access and use for productive applications.

SDG 9 "Industry, Innovation and Infrastructure"

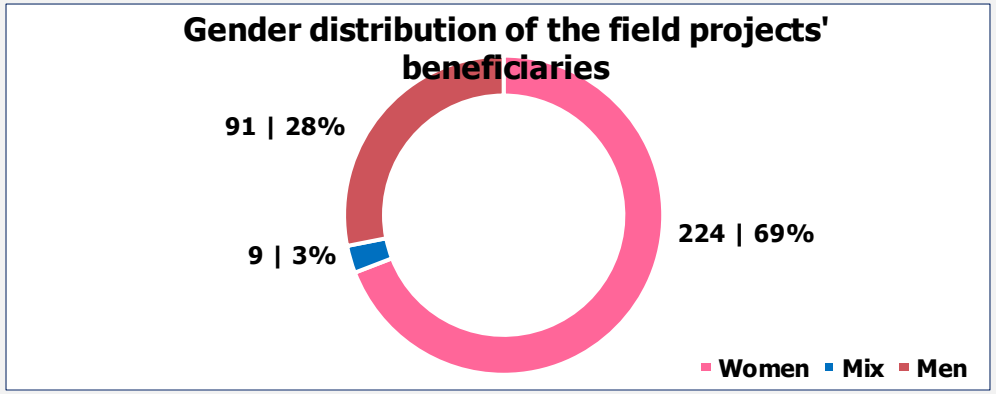
- Increase the productivity and efficiency of rural beneficiaries through renewable energy, energy efficiency, and productive equipment

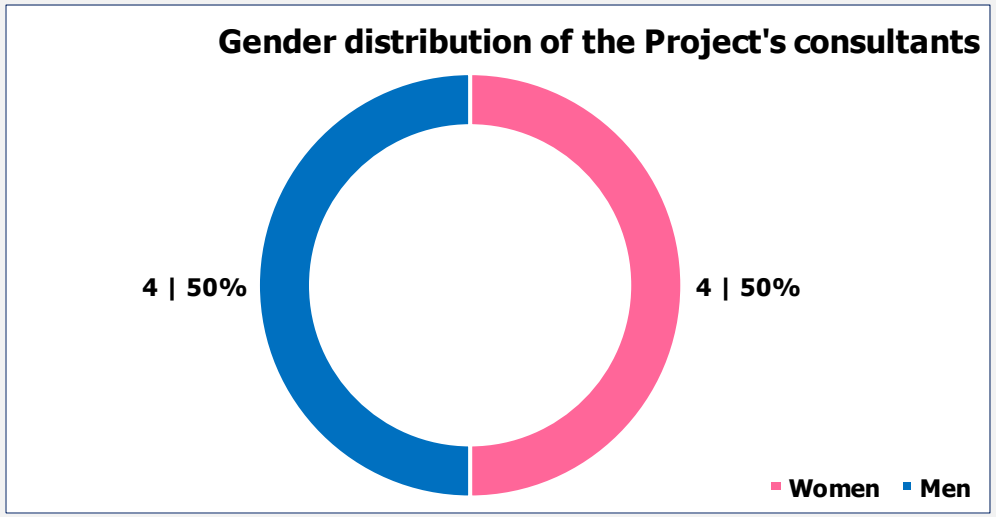
KPIs and associated SDGs: ……what is the impact of this initiative? Achieved benefits for Jordan, Lebanon and Tunisia.

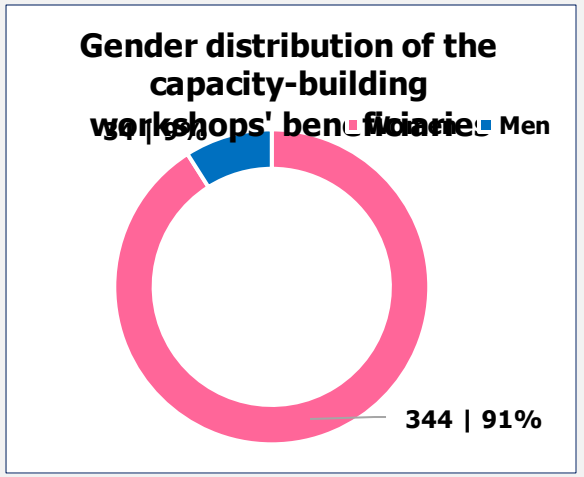


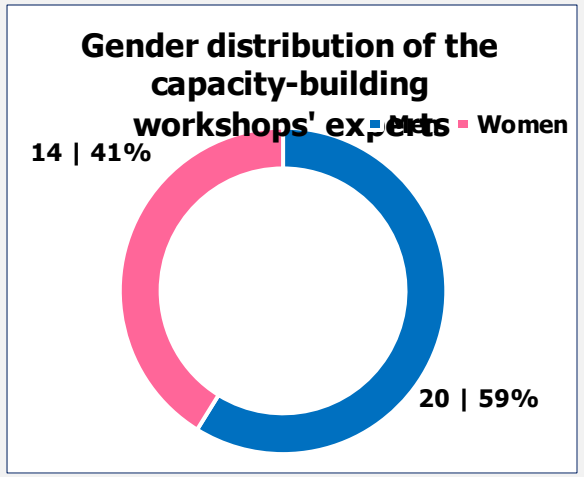


REGEND's GENDER Response Business Model









Women representation throughout the Project's activities highlighted above amounted to:

- 69% in the field projects
- 91% in the capacity-building workshops (beneficiaries)
- 41% in the capacity-building workshops (experts)
- 50% in terms of Project consultants
- **for a total average of 64%**

REGEND's Success Stories … Snapshot

Success Story 1: Al-Jawhara CBO in Jordan transforms into a hub for the women and youth of Al-Achaari

Success Story 2: REGEND's installed solar RE enabled and empowered Women's Agro-Food Cooperative of Akkar El Atika, Lebanon to endure the country's financial, economic, and electricity crises

Success Story 3: Partnership between AOAD and ARABFFI within the framework of REGEND

Success Story 4: REGEND empowered Ms. Fethia Bougtif, a farmer in Chorbane, Tunisia, to expand her farming land and bring prosperity to her family.

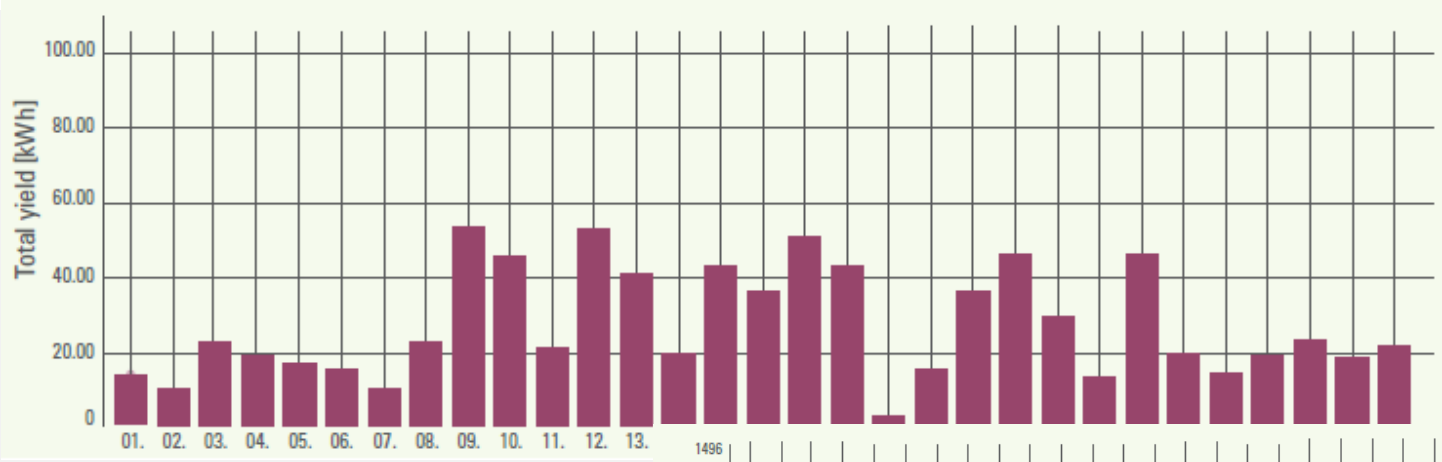
Success Story 5: REGEND empowers the heads of municipalities

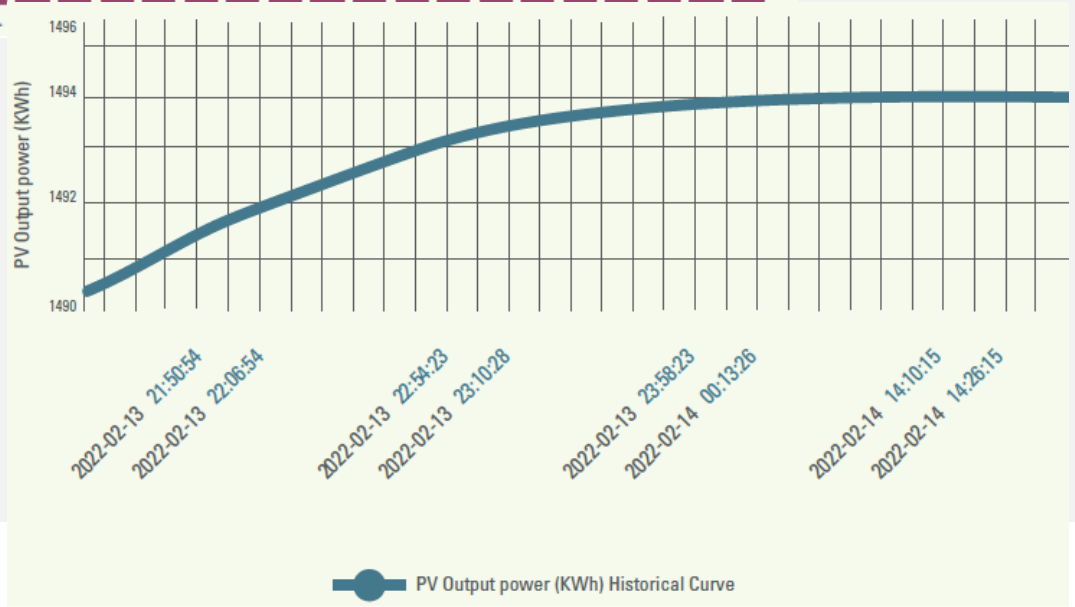
Success Story 6: Local youth invited to attend training session covering the operation and maintenance of the installed renewable energy systems

System monitoring

data collected for the two systems that were equipped with remote data monitoring capabilities

Electrical energy (kWh) generated daily by Akkar Al-Atika system — January 2022; total for month = 864 kWh.

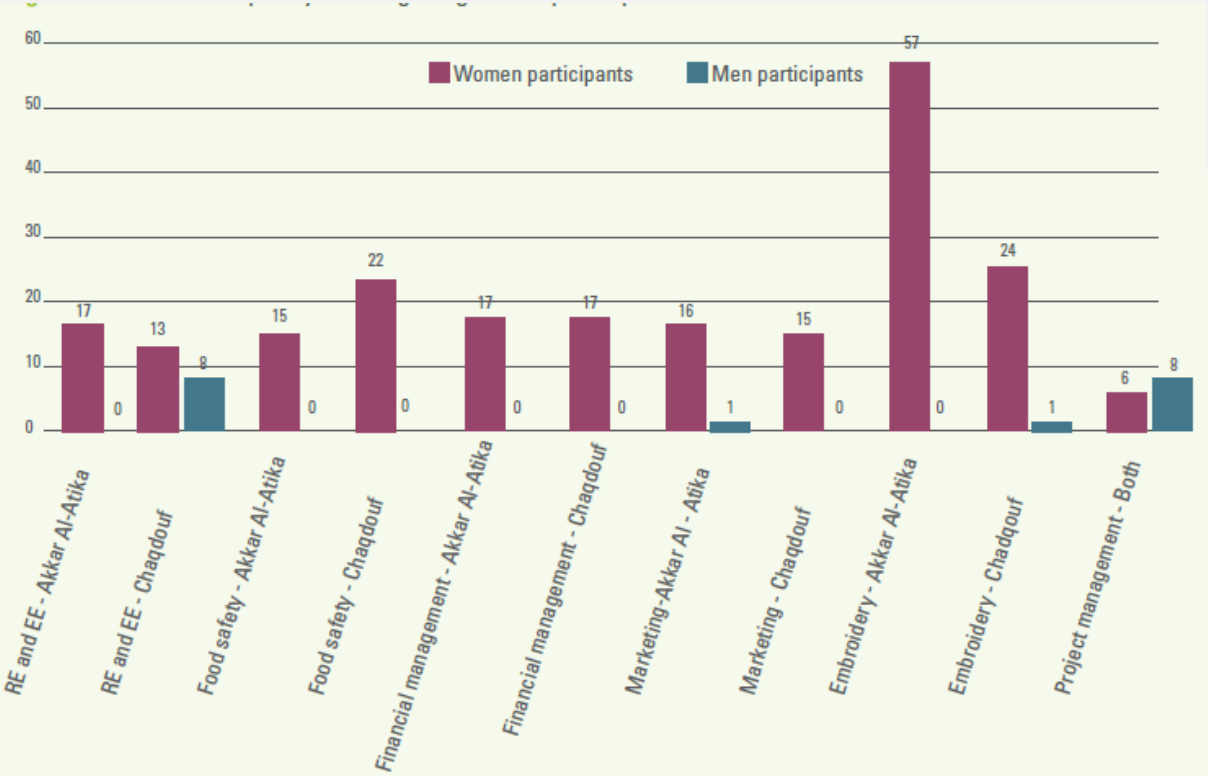




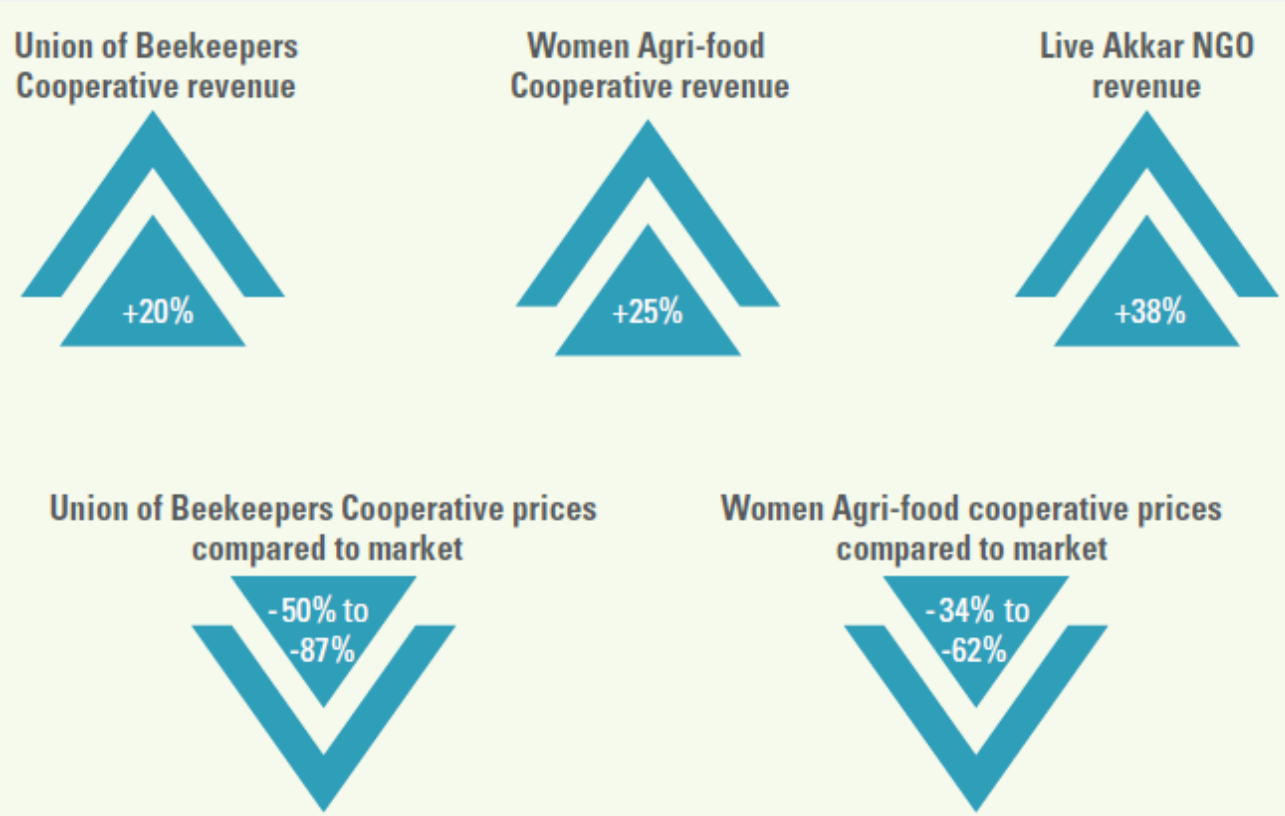
Tunisia:
Electrical Energy (kWh) generated for water pumping at farm of Ms. Bougtif over period from 13 to 14 February 2022; total = 1,494 – 1,490 = 4 kWh.

Documented results at beneficiaries in Lebanon

Lebanon Capacity Building Programme



Impact of field projects on income-generating activities of beneficiaries



Production equipment provided in Lebanon

Beneficiary	Equipment
Municipalities of Chaqdouf and Akkar Al-Atika	Two kishek grinders
	A pomegranate juicer
	Desktop computers
	Office chairs and tables
	A projector and a screen
	A food mixer
Municipality of Akkar Al-Atika	A pomegranate peeler
Municipality of Chaqdouf	A kishek dryer
	A freezer and fridge
	A cooking stove
	A fan
Women Agri-food Cooperative in Akkar Al-Atika	A commercial cooking stove
	Two portable/floor commercial cooking stoves
	A commercial fridge
	Two fans
	A dual-mode space heater
Union of Beekeepers Cooperative in Akkar Al-Atika	A sugar grinder
	A sugar kneader
	Three syrup barrels
Live Akkar Sewing and Embroidery Workshop in Chaqdouf	A sewing machine (electronic embroidery)
	A sewing machine (automatic buttonholer)

The multidimensional benefits of upscaling REGEND's business model

Country	Systems Capacity (kWp)	First-year electricity generation (kWh)	25-year lifetime cumulative electricity generation (kWh)	25-year lifetime cumulative electricity generation (TOE)	25-year lifetime cumulative GHG savings (kg CO_2)	25-year lifetime cumulative monetary savings (USD)
Jordan	73	112,000	2,611,000	224.66	1,197,144	445,755
Lebanon	35	52,500	1,200,000	103.25	847,240	600,000
Tunisia	118	201,000	4,668,000	401.64	1,745,832	513,480
Total	226	365,500	8,497,000	739.55	3,792,216	1,559,350
Carbon Cost*					511,950	
10x Upscale of REGEND						
Total	2,260	3,655,000	84,790,000	7,295.51	37,922,160	15,592,350
Carbon Cost*					5,119,492	

*According to the Intergovernmental Panel on Climate Change, a price level of $135–5,500 in 2030 and $245–13,000 per ton CO_2 in 2050 would be needed to drive carbon emissions to stay below the 1.5°C limit.

REGEND: Business Model specifcities

1. ASSESEMENT OF SOCIAL, ECONOMIC, POLITICAL AND ENVIRONMENTAL CONTEXT
2. ADOPT INTEGRATED AND GENDER RESPOSNE BUISNESS MODEL
3. MULTISTAKHOLDER ENGAGEMENT AT LOCAL AND SUB-NATIONAL LEVELS
4. INCLUSIVE PARTNERSHIP APPROACH
5. REINFORCING SYNERGIES AMONG PROJECT PILLARS
6. LEARNING FROM THE PILOT PROJECTS
7. INVESTING IN THE UPTAKE OF KNOWLEDGE AND EVIDENCE INTO POLICY
8. MONITORING AND IMPACT ASSESSMENT FOR SUSTAINABILITY AND DUPLICABILITY
9. OWNERSHIP AND AGILE APPROACH FOR PROJECT MANAGEMENT
10. REVERSE KNWOLDGE , DOCUMENTING AND SHARING EXPERIENCES AT NATIONAL AND REGIONAL LEVELS

Recommendations for successful business model development
support of the integrated approach for water-energy –food sectors to enable just and inclusive energy transition

Assist rural communities in evaluating their energy and water needs

- … to have the right baseline and to design an adequate solution for the intended purpose.

Understand the challenges faced by local communities … especially women and young people, to make sure the solutions proposed are suitable for the community.

Promote and operationalize technologies and processes that improve efficiency and free up water and energy resources.

Foster Multistakholder engagement and collaboration

- … bring government, public and private players, Local communities, NGOs, ..together to implement policies and projects effectively.

Adopt financial, social and environmental indicators

…Include continuity of the projects for sustainability of its impact

- … monitoring projects to measure the impact of the RETs on rural communities.

Provide capacity building

- … to financial institutions so that they better understand the viability of selected technologies and, as a result, offer adequate financial instruments.

Provide access to green and micro financing

- … to encourage rural communities to adopt RETs to improve their lives and livelihoods.

Strengthen evidence base, information quality, data collection by putting in place data management plans and protocols, with monitoring and accountability measures and clear KPIs to increase confidence between parties.

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Thank you

https://www.unescwa.org/sub-site/renewable-energy-rural-arab-region-regend