OPPORTUNITIES IN CLEAN TECHNOLOGY: AN ASSESSMENT OF AWARENESS AND BEHAVIOURS IN THE JORDAN VALLEY

JORDAN VALLEY LINKS

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Context

The Jordanian government and economy face several challenges in the energy sector such as rising demand, increased per capita consumption and electricity tariffs and cross-subsidies. Solid waste treatment is also an issue with most waste disposed in open dump sites with almost no treatment except in Amman. Where recycling exists, recycling and waste separation at the household level requires more awareness and training. Additional recyclable waste collectors and depots are needed, but the development is constrained by costly financial models. Subsequently, Energy Efficiency (EE) and clean technology solutions for consumption and waste management are priorities for Jordan.

Jordan Valley Links Overview

The Jordan Valley Links (JVL) Clean Technology partnership aims to build the capacity of women and youth in the Jordan Valley to become more aware of energy and waste issues while becoming clean technology entrepreneurs. To achieve this, JVL uses a three-pronged approach that combines awareness, technical training and partnerships around renewable and or clean energy, energy efficiency and climate smart agriculture. This includes activities that support women and youth to develop technical and soft skills and create market linkages in the clean technology sector. These linkages will increase the economic participation of women and youth and inspire behavior changes within the community regarding the use and adoption of clean technologies. The project’s Clean Technology tripartite partnership includes:

**Government: National Energy Research Center (NERC)**

Established as part of the Royal Scientific Society (RSS) for the purpose of research and development, capacity-building and training in the fields of renewable energy as well as the promotion of energy efficiency in various economic sectors in Jordan.

NERC is the lead partner in this partnership with an overall management role, in addition to leading on the EE & RE component to conduct energy technical assessments in selected municipalities of the Jordan Valley.

**Non-Governmental: Future Pioneers Empowering Communities (FPEC)**

Future Pioneers for Empowering Communities (FPEC) is a local Jordanian non-profit organization established in 2012 with the aim of eliminating poverty and contributing to human development in the most remote areas in Jordan. FPEC is responsible for implementing all project activities concerning Promotion of Gender Equality, Socio-Economic Entrepreneurship, Community Engagement and Awareness Raising.

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1 Cross-subsidization is a method of artificially lowering prices by increasing the price for certain consumers.
Private Sector: GreenTech

Established in 2008, GreenTech was one of the first clean technology companies in the Middle East. GreenTech offers professional contracting and consultancy services for the Energy, Water, and Environment sectors. It has not only supported the integration of green energy solutions in the MENA region, but has also been instrumental in the development of the solar photovoltaic (PV) industries in Jordan, UAE, Egypt, and Saudi Arabia.

GreenTech is responsible for conducting the water and agriculture assessments in selected municipalities of the Jordan Valley, and leading on the Water and Waste Component along with Business Entrepreneurship in this partnership.

Methodology

To identify opportunities for clean technology programming in the Jordan Valley, the project undertook an assessment of awareness and behaviours associated with energy consumption and waste management in three municipalities: Tabaqet Fahel, Al Shouneh Al Wosta, and South Aghwar. Five specific sub-groups were assessed: households, agriculture (i.e. farms), schools, mosques, and commercial (i.e. small businesses). Multiple methods of data collection were used such as secondary research, surveys, and focus groups. Nineteen focus groups were held in which 223 people participated.

The findings in this report will form a solid base of evidence which will inform future JVL interventions in the clean technology sector.

Findings

Households

Across all three municipalities, knowledge and application of energy efficient practices are low amongst most households. Use of fluorescent (FLUOR) and incandescent (INC) lighting varies as does the method of heating households (gas, electricity, firewood, etc.). Municipal waste collection remains high, but the prevalence and rate of recycling varies.

![Figure 1: Lighting Usage by Type](image-url)
Despite poor usage, there are opportunities to expand the adoption of clean technology devices amongst all members of the household through awareness sessions and workshops. The data shows that there is a willingness to adopt energy efficient practices if given the right motivation (i.e. financial incentives).

Agriculture/Farms
The agricultural sector is heavily affected by water scarcity issues in the region and thus represents a major opportunity for clean technology solutions to combat these issues. Adoption of energy efficient practices are considerable in this sector as a significant subset of respondents utilize some form of EE lighting. In addition, respondents reacted favourably to the opportunity of securing loans to finance PV and solar water heating (SWH) systems.
Most of the waste produced on farms or other agricultural enterprises is disposed of using traditional means (i.e. municipal waste pick-up) but there is a major opportunity to improve waste management practices to reduce both environmental impact and dependency on importing fertilizers and other resources.

Figure 4: Water Demand and Scarcity By Percent of Population

Figure 5: Lighting Systems by Municipality
Schools
Schools in all three municipalities were surveyed and assessed on their commitment to energy efficient practices and behaviours. Most schools in all municipalities use fluorescent lighting systems except in the case of South Aghwar where they use a combination of fluorescent and other light sources. For the most part, schools do not use their own heating system but kerosene and gas-powered heaters seem to be the most common heating device.

Overall, there is no effort to separate black and grey water and instead a septic tank is usage for all related wastes. Garbage collection is handled primarily by the municipality, but recycling efforts are practically non-existent. This represents a major opportunity to improve community involvement with recycling efforts. As an aside, respondents responded favourably in favour of attending workshops on energy-saving and clean energy.
<table>
<thead>
<tr>
<th></th>
<th>Separates Black &amp; Grey Water</th>
<th>Septic Tank Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabaqet Fahel</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Al Shouneh Al Wosta</td>
<td>No (80%)</td>
<td>Yes</td>
</tr>
<tr>
<td>South Aghwar</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Table 1: Black/Grey Water Disposal & Septic Tank Usage, Schools*

<table>
<thead>
<tr>
<th></th>
<th>Collection Rate</th>
<th>Recycling Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabaqet Fahel</td>
<td>Primarily Burnt</td>
<td>None</td>
</tr>
<tr>
<td>Al Shouneh Al Wosta</td>
<td>73%</td>
<td>10%</td>
</tr>
<tr>
<td>South Aghwar</td>
<td>93%</td>
<td>None</td>
</tr>
</tbody>
</table>

*Table 2: Waste Disposal & Recycling, Schools*

**Commercial**

Lighting varies across shops and businesses in all municipalities, with respondents using a mix of lighting types such as fluorescent, LED, and CFL bulbs. There is a lot of room for improvement in this sector as awareness of clean technology and energy efficient practices. A significant majority are not aware of concepts such as clean energy saving or energy efficiency labelling on appliances. In all but one municipality, energy efficiency does not appear to be a priority when purchasing appliances.

<table>
<thead>
<tr>
<th></th>
<th>Clean Energy Saving</th>
<th>Energy Efficiency Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabaqet Fahel</td>
<td>70% Don’t Know</td>
<td>70% Don’t Know</td>
</tr>
<tr>
<td>Al Shouneh Al Wosta</td>
<td>45% Don’t Know</td>
<td>76% Don’t Know</td>
</tr>
<tr>
<td>South Aghwar</td>
<td>64% Don’t Know</td>
<td>82% Don’t Know</td>
</tr>
</tbody>
</table>

*Table 3: Clean Energy & Efficiency Awareness, Commercial*

Wastewater disposal is treated in much the same way across all municipalities. Septic tanks are used by a majority of respondents, but wastewater is typically not separated. Recycling is not common amongst businesses in any municipality, as waste is typically mixed (i.e. paper, plastic, etc.) and often collected by the municipality or burned.
<table>
<thead>
<tr>
<th></th>
<th>Waste Collection</th>
<th>Recycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabaqet Fahel</td>
<td>Collected (77%), Burned (8%), Both (15%)</td>
<td>None</td>
</tr>
<tr>
<td>Al Shouneh Al Wosta</td>
<td>79% Collected</td>
<td>4%</td>
</tr>
<tr>
<td>South Aghwar</td>
<td>97% Collected</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 4: Waste Disposal & Recycling, Commercial

Conclusion
This report was a collaborative effort between JVL and the clean technology consortium. The findings in this report will form a solid base of evidence which will inform future JVL interventions in the clean technology sector which will in turn aid in improving awareness and participation in environmentally sustainable practices. There is a clear opportunity for better infrastructure and service delivery at the municipal level, particularly in households, schools, and commercial buildings. Overall, this report aids in the ultimate goal of JVL: to increase access to financial and capacity-building resources for women and youth in order to improve the prospects for entrepreneurs and small and medium-sized enterprises.
Offices in Canada, the United States and around the world. Visit our website for a complete list.

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