Emergency Market Mapping and Analysis – EMMA
of the Irrigation Water Market in Al Zannah and Sureij Areas, Gaza Strip

Recommendations for Recovering Agricultural Livelihoods for Small-holder Farmers

EXECUTIVE SUMMARY

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The Current Situation
The Ministry of Agriculture damage assessment report of the Israeli incursion and war on Gaza during the summer of 2014 pointed out that the greatest damage in the Khan Yunis governorate is in its eastern villages. Of those villages, the Al Zannah and Sureij areas are the most affected. Key input from field visits and interviews with farmers has identified that irrigation water for agriculture is the most critical market system in both areas, as it was widely regarded as the greatest barrier to farmers, especially small-holder farmers who farm less than 3 dunums, in regaining their livelihoods.

The Target Group
The study has identified its target group to be 400 small-holder farms in Al Zannah, and 250 in Sureij, where agriculture is the primary livelihood to support those households. The 650 small-holder farmers in this area are cultivating a total of 1600 dunums (800 dunum fruit trees, 800 dunum field crops) and have generally been growing mostly or only vegetable field crops as a livelihood activity, and not olive, date or almond trees which are seen on larger farms in the area. Using the average Gaza household size of 6.4 persons\(^1\) as a basis for calculation, the 650 small farms partially or entirely support 4,160 people. These farmers have been deriving approximately 65% of total household income from agricultural activities.

The Assessment Methodology
The study has adapted the standard Emergency Market Mapping and Analysis (EMMA) as a rapid ten-step process assessment of the water irrigation market system. The study focused on key critical market systems and has a combined gap, market, and response analysis sections. It also provides a section on the comparison of the current market system to a baseline model of market functioning, which identifies key market system constraints.

EMMA Assessment Results
In Al Zannah, a small fraction of the pre-conflict capacity to supply irrigation water remains while Sureij currently has no capacity to pump irrigation water.

Out of necessity, small-holder farmers are investing their own money and energy in farming crops that don't require irrigation water. This has a further deadening effect on the revival of the irrigation water market. Accessing credit, loans and microloans is effectively zero amongst farmers and is not an option due to religious and cultural reasons.

The war has created significant challenges on both the supply and demand sides of the irrigation water market system both inside and outside of the water wells. It is also not clear if the supply chain could fulfil all the market need for repair without prices being affected, however, most farmers from the Sureij area purchase the agricultural inputs from Khan Younis area, while Al Zannah farmers purchase from Bani Suheila. In addition, these vendors also sell herbicides, pesticides, and seeds. Carrier lines, plastic drip and sprinkle irrigation pipes are also readily available and vendors can restock within 2-3 few weeks. Prices for agricultural inputs have remained stable relative to pre-conflict levels. However, there is a shortage of new stainless steel pipes, due to Israeli border restrictions. Likewise, there is a shortage of different capacities of water well and irrigation distribution pumps and in general pumps have increased in price.

When taking into the consideration the cost of buying and maintaining the carrier plastic pipes, farmers tend to source water from wells closest to their farms. Generally, small-holder farmers buy the irrigation water mostly from the water wells that exist at the large and medium farms.

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\(^1\) “Coping with Conflict: Poverty and Inclusion in the West Bank and Gaza”, Pg 24, The World Bank, October, 2011
**Effect on Households**
Households in Al Zanna and Sureij have lost their main source of income out of vegetable crop farming as a result of the destruction of the supply of irrigation water system.

Households in the Sureij area are increasing their reliance on purchased food or mostly from aid distribution versus consuming what they've used to grow before the war. During the data collection in November 2014, the average value of household monthly expenditure has dropped by 22% to 1469 ILS due to losing their main source of income out of farming. In Al Zannah, household income has declined by 42%, increasing their vulnerability. In comparison to Sureij area, AL Zannah household expenditures have risen by 23% to 2060 ILS as families are spending more money on housing (maintenance and rent) while Sureij farmers are not. As such, the value of ‘own food consumed’ reduction from 9% to 1% indicates that households have to sell their own grown food rather than eat it because they need the cash to pay for other expenditure.

**Estimated Cost of Recovery**
Preliminary recovery costing calculation was based on pricing input collected as part of the rapid assessment. Estimated costing indicates the following:

1. **Water Wells** - The estimated average cost of rehabilitation of wells for 31 damaged wells (10 Vertical Wells, 21 Horizontal Wells) depends on the whether plastic or metal pipes (higher cost) are used to replace the damaged pipes, poles and sockets and range from ILS853,000 to ILS1,042,000 for vertical wells and from ILS1,216,000 to ILS1,432,00 for horizontal wells

2. **Concrete water storage tanks** - The average estimated cost of rehabilitating 20 damaged concrete water storage tanks (10 Vertical and 10 Horizontal) that have a capacity of 100 m³ is 60,000 ILS each.

3. **Water irrigation system** - The components of the irrigation system include Main Carrier Lines (4 inch), Sub Carrier lines (2.5 inch), Irrigation networks (0.5 inch), Drip networks, Transformers (2.5, 4, 16 inch) and filters, Connectors (2.5 inch), Control valves (0.5 and 2.5 inch), Sprinkles, Nylon/Clot Cover Rolls and Pumps. The estimated cost of irrigation system recovery for the 650 farmers ranges from ILS 2,704,000 if Egyptian pumps are procured (preferred by farmers for its dual use in fertilizing and spraying pesticides) or ILS 3,679,000 if Israeli pumps are procured.

Further market analysis to understand which wells to rehabilitate that maximize value for money once repaired and how many farmers that were affected or the exact demand of generator fuel needed was beyond the rapid EMMA assessment.

**Strategy for Recovery**
For the supply side of irrigation water, the recovery strategy is to increase the capacity of the water providers to meet the current and near future demand by small-holder farmers for irrigation water.

For the buyers of irrigation water, the demand side recovery strategy is to kick-start artificial stimulation on short-term in lieu of weak purchasing power by farmers to replace the damaged water irrigation system (outside of the well). The strategy also calls for medium-long term action to facilitate with key stakeholders to implement the suggested recommendation and to change the behaviour of farmers in how they currently manage the water-well irrigation system and resources.

**Recovery Implementation Method**
The war damage to the agriculture water irrigation specifically is so extensive that continued assistance through voucher system will be necessary to help households meet their income gap.

**The Need for a Future Vision**
The Gaza coastal aquifer is overtaxed from salinity and contamination. As such, this situation presents a new opportunity for Gaza to develop a new vision for its irrigation water resource management.

A future vision for Gaza is the sustainable utilization of water that provides food and livelihoods for as many people as possible. The pursuit of that goal must be market-orientated and adopt a sophisticated, multi-modal approach applied over time addressing multiple critical points identified in this study including: policy and governance environment; remedy for water salinity and contamination; detailed analysis on the dynamics of supply and demand between providers and buyers of irrigation water and implementing best water management practices through new agriculture and renewable energy technologies.

Conclusions
The report concludes with options and recommendations for establishing or restoring livelihoods for populations which previously relied on irrigation water for their central livelihoods strategies. The report provides a matrix of response recommendations divided into two groups: short/medium-term, which addresses pressing recovery needs, and; medium/long-term which begin the process of evolving and improving the utilization of water in agriculture.

In the first instance, the short to medium-term recommendations are to

1. Rehabilitate of the selected wells, carrier lines, as well as restoration of land and irrigation infrastructure such as cement storage tanks and irrigation ponds either for an individual or a group of farmers.
2. Provide vouchers for farmers to purchase materials (goods) and repairs (services) for restoration of irrigation infrastructure and rain water capture. To also technologies that save from water evaporation that can also be used with well-fed irrigation.
3. Provide training programmes for farmers on new irrigation technologies and green houses

For improving the utilization of water agriculture on medium to long-term, the report recommends training affected farmers on rainwater irrigation, selection and cultivation of appropriate crops, following water availability and soil tests.