



Union Aid Abroad-APHEDA

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MA'AN Development Center

“

The income encouraged me to save a small amount each month so that my daughter can attend university next year, she is an excellent student and I do not want her to lose the opportunity for an education.”

”

*Mrs. Fatoom Qudeih,
beneficiary of a green house in Gaza Strip.*



*Case Studies of Resilience and Livelihood Building Among Vulnerable Palestinian Farmers and Women
Union Aid Abroad -APHEDA and MA'AN Development Center
Australia-Middle East NGO Cooperation Agreement Phase II, supported by AusAID
occupied Palestinian territories*

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Picture of Qudeih family , Gaza Strip

Case Study 1:

Water Interventions

By applying a household and community based water intervention strategy, the APHEDA-MA'AN project has a direct impact on increasing production, reducing vulnerability and supporting food security.

Context

In the occupied Palestinian Territories, the APHEDA-MA'AN project works within the structural and political challenges of the Israeli occupation, including the issues of water access and control. Palestinians in the West Bank are forbidden from accessing ground water resources effectively whilst Palestinians in the Gaza Strip can only access highly salinated and polluted ground water from degraded, expensive, and inefficient systems. Therefore, the problem of water in the occupied Palestinian Territories is not primarily due to a scarcity of resources, but lack of access. The protracted conflict and occupation have led to the destruction of lands, infrastructure, and resources, and resulted in the enforcement of access and movement restrictions.

Water access and quality are crucial for farmers to increase production and contribute to food security in the districts of Khan Younis (Gaza) and Tulkarem (West Bank) in which the project works. These communities face the challenge of restricted access, but experience it in different ways. The project baseline in 2009 revealed that 92.9% of surveyed residents in the cluster of seven villages in Tulkarem felt the impact of water shortages; only the village of Kufr Jammal maintained irrigated agriculture as opposed to all other villages which solely relied on rain to water their crops. In Khan Younis, an area subject to Israeli military incursion and the imposition of a 'buffer zone', the district is dependent on piped ground water from existing wells in western

Gaza. The destruction of land and infrastructure, water scarcity and high purchase costs of water (averaging AUD \$0.59 per cubic metre) impact on the capacity for food production. In both districts the situation keeps households in cycles of food insecurity and unstable incomes. It also prevents farmers from investing in their land and their family's long-term needs.

Project

The APHEDA-MA'AN project aligns with the national agricultural strategy of the Palestinian Ministry of Agriculture which supports both the West Bank and the Gaza Strip. The project respects and understands the differences in context and agriculture between the West Bank and Gaza and considers these differences in planning interventions and strategy. Food production is a key pillar of food security and a core part of the project strategy, but one that is dependent on an adequate water supply. Therefore as part of its agricultural production strategy the project works to support water supply and management in both Gaza and the West Bank, including constructing water cisterns, rehabilitating water reservoirs, installing of irrigation pipelines and networks, building rainwater harvesting systems, and rehabilitating water ponds.

The Israeli policy prohibiting the drilling of groundwater wells in Tulkarem has led APHEDA-MA'AN to focus on capturing rainwater. Significant outputs include 200 water cisterns which can harvest almost 15,000 m³ of rainwater, a pond in the village of Kufr Jammal for 28 farmers, the rehabilitation of a 4,500 m³ water reservoir in the village of Kur that supports the 350 residents of the village with household and agricultural water and 500 metres of irrigation pipelines in the village of Kufr Jammal. Effective water infrastructure depends on community level-shared water resource management. For example, the APHEDA-MA'AN reservoir in Kur supporting the entire village with agricultural and household water, is managed by the community, including responsibility for maintenance. Further, village support committees, made of community

volunteers, facilitate project activities and build the capacities of local networks for mutual support. The construction of the pipeline in the village of Kufr Jammal has facilitated water access to 20 farmers to irrigate their crops, who jointly manage their water supply. Many of the crops in that area, such as citrus trees, need a steady supply of water all year round.

In Khan Younis over the four years of the project, irrigation networks have been installed for 57 hectares of rehabilitated land, secondary irrigation networks for 23.7 hectares of intercropped land and 122 greenhouses. 152 water tanks have been provided with women's home garden packages, with 25 water ponds and rainwater harvesting gutters for the greenhouses of 90 beneficiaries. These activities collectively mitigate the impact of water shortages, high water prices, inefficiencies in supply, and salinity.

Within the wider context, these project activities are sustainable answers to water needs because they directly increase control over water management and improve water quantity and quality in order to improve food production. On the farmer and household level, by enhancing water-use efficiency, farmers are able to decrease the cost of irrigation, using savings to expand their farms, diversify crops, buy food they otherwise could not, or purchase other household needs.

Community level water infrastructure was not originally included in project plans, as the overriding approach was household level food security, but it was soon clear that there was community demand for such activities and that they would further strengthen food security interventions. For example, the construction of the water collection pond of Kufr Jammal was identified by the community as 28 farmers had difficulties in managing irrigation water. They explained how the water supply was uncertain and would be cut off for days. Many had considered abandoning their existing greenhouses altogether. The water pond now helps to control and manage the supply of water more effectively and efficiently, cutting down

wastage, and has promoted further investment in the greenhouses. The positive impact of this activity on the farmers of Kufr Jammal provides a lesson on how other communities in the project can use community-level water management utilities.

Results

Khan Younis district, Gaza Strip



The projects activities around water in the Gaza Strip have been making measurable and sustainable improvements in food security and livelihoods.



Mrs. Basema Abu Edwan has benefited from an irrigation network for intercropping and land rehabilitation in 2011, the third year of the project. She works on her land with her children and husband. Before the APHEDA-MA'AN project support, they did not make enough produce or income to support their household needs. Basema says, "[we] were not able to use our three dunams [3000m²] of land, it was empty because we did not have an irrigation

network.” Consequently, her husband was forced to work for other farmers to support their family. Dependence and economic insecurity perpetuated her family’s vulnerability.

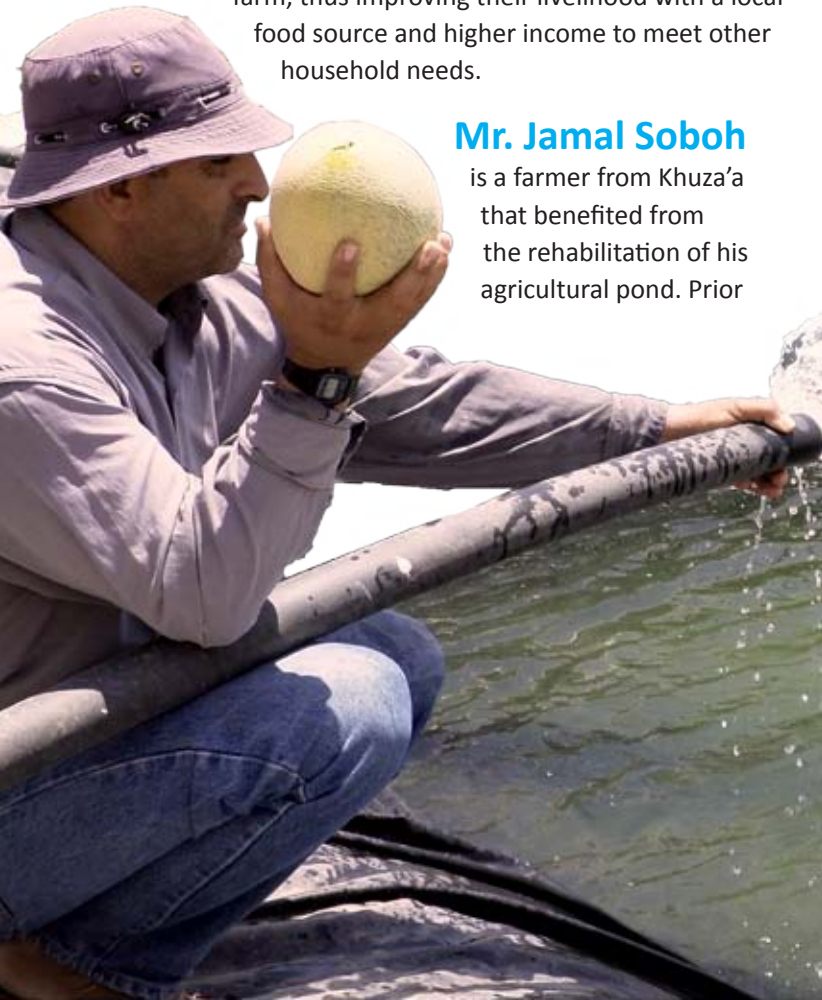
Basema continues that the greatest benefit of the irrigation network provided by the project was increasing her family’s control over their own livelihoods. “My husband can now work on his own land instead of the land of other farmers – this makes us feel more safe and secure...the project really saved our land and encourages us to continue planting. Once we got the irrigation network, we planted okra seeds and earned (about AUD \$2,060 as a net profit) in one season (six months).” To support regular income, the family introduced crop diversification. After the end of the okra season, they used the irrigation network to plant a diverse selection of crops, Basema explains: “We select the seeds according to the season and we try to plant more than one kind of seed so we can use it for family consumption and to sell.” Basema’s family consistently earns around AUD \$295 every month that can cover some of households expenses. This local water management system has increased Basema’s control over her family’s farm, thus improving their livelihood with a local food source and higher income to meet other household needs.

Mr. Jamal Soboh

is a farmer from Khuza’a that benefited from the rehabilitation of his agricultural pond. Prior



to the project, Jamal’s pond was suffering from lack of maintenance because he could not afford to fix it and consequently lost large amounts of agricultural water. He was paying AUD \$442 for water per month and could not effectively manage the irrigation of his crops. Today, Jamal pays AUD \$294 per month, reducing his costs by one third, and he saves 50 m³ of water each month. Between the money saved and water collected, Jamal has expanded his farm and improved his income. His pond collects fresh rainwater that allows him to plant rock-melon and tomatoes and additional field crops. The pond’s fresh water has further improved soil quality by lowering salt levels. With higher quality and cheaper water, Jamal is making new investments in his land and saving water.



Farmers are using project infrastructure and technical support to address the issue of salinification.

Mr. Abdelqader Qudeih from Khuza'a, who benefited from the irrigation network comments, "we plant okra for around two years and in the third year, we will plant wheat and barley to extract salinity from the soil." Access to water through the irrigation network allows Abdelqader to continue planting; using more diverse crops mitigates erosion and strengthens the soil in the long-term. He works with farmers in his community to solve these problems.

Tulkarem district, West Bank

To respond to issues of water scarcity in the village of Kur, the APHEDA-MA'AN project rehabilitated a reservoir to support the water needs of the village's 350 residents. **Mr. Jalal Jayousi**, a farmer from the village, explains that prior to this, "we used to buy water from nearby villages for drinking and irrigation". Before the rehabilitation, Jalal would keep his livestock limited to 10 due to a lack of water, but now "the reservoir encouraged me to start a sheep farm with 80 sheep and now I have 130." The reservoir is now supplying the entire village of Kur with a reliable water resource that collects rainwater. It has tangibly secured the livelihood of farming households like Jalal's. The revenue from selling the reservoir's water goes to the village council who use the money to pay for street lighting and rubbish collection. Rehabilitating the 4,500m³ reservoir has decreased the price of irrigation water by 75%; a 4m³ tank that used to cost AUD \$24 when bought from nearby villages now costs only \$6 from the reservoir. The price is even cheaper when a farmer picks up water using his own truck. Jalal explains that he uses his own tractor to carry water; it costs him only AUD \$3.6. "This is a substantial saving," he points out.

They drink one cubic meter of water a day. If the reservoir was not there, the water for the sheep would cost me 20NIS a day. Now, it costs me 3NIS only. This is a substantial saving."

Mr. Jalal Jayousi



Increased access to water and involvement in water management strengthens rural women's ownership over their own livelihoods, such as in the village of Shufa. **Mrs. Ibtisam Hamdan**, a mother of four, benefited from an in-ground cistern from the APHEDA-MA'AN project. She was able to increase production from her 47 lemon trees, so her family purchases less food on credit: "We trade lemons with neighbors for vegetables and fruits." Ibtisam is unemployed and her husband earns fluctuating income from planting thyme and other seasonal crops. Ibtisam's lemon trees have at least



doubled in production from 3,360 to 7,620 kgs per year allowing her to increase her profit by AUD \$704 or 81.5%.

This additional income has helped the family to be able to enroll one son in university and keep the only daughter in college. Ibtisam says the cistern has provided them with a sense of security: “we would get afraid when the water supply [through public network] would stop...we would bitterly watch lemons wither and fall down due to thirst; now we have some control over water.”

Increased access to water also assists farmers to make long term investments in food production. **Mr. Rashid Ghanayim**, a farmer from the village of Kufr Zibad that supports a household of six people, planted 200 new olive trees after benefiting from a water cistern: “I could not have grown these trees without having a cistern.” Before the intervention, Rashid would only plant seasonal crops of wheat and barley that do not require intensive irrigation. Therefore, production would fluctuate depending on rainfall levels. The cistern enables him to save AUD \$613 a year on water for irrigation and it is predicted that these trees will yield around 142 kgs of olive oil worth AUD \$852.8 after they start producing five years from now.

The APHEDA-MA'AN project constructed pond for Kufr Jammal village, which supports the livelihoods of 28 farmers. The village lost swathes of land behind the Separation Wall. Without local water resources, farmers bought water from another village three kilometres away from the village. Water was purchased on a pre-paid, hourly basis and was mostly available from 6pm to 6am. **Mr. Moqbil Aqel Salhab** is a family bread-winner in Kufr Jammal. Prior to the project, Moqbil considered selling his greenhouse because of this uncertainty in water access: “the timing of irrigation was unpredictable...sometimes my plants would wait days without water.” Consequently, he

could not produce a quality harvest to sell: “my molokhia (jute) leaves were too yellow...people would not buy them.”

Through the project’s community pond, Moqbil has direct control over irrigation and coordinates distribution of water with the 28 farmers with whom he shares it. He has enough water to grow a high quality, productive harvest from which he can earn a better income. With control over irrigation, he is now using 25% less water and saves AUD \$22.5 per month. Further, Moqbil previously had water running to his crops for five hours a month and now needs only 3.75 hours per month. Instead of staying up into the night waiting for his turn to irrigate his land, Moqbil now uses this time to expand the farm; Moqbil rehabilitated and planted 0.25 hectares of his greenhouse and land with lemon trees and molokhia, a crop historically grown in Palestine. Between both crops, his net income this year was AUD \$3,723. He plans to rehabilitate another seven dunums (0.7 hectare) of land to plant more lemon trees. Moqbil says “lemons are sustainable; they will be around when my kids grow up.” Moqbil’s access to fresh water and increase in production has boosted his confidence to invest in his farm. Monitoring visits of the area have witnessed a dramatic turnaround, with previously dilapidated and unplanted greenhouses being repaired and planted due to a more reliable water supply.



Lessons Learned

After four years of implementation of this project within AMENCA 2, the project has matured and learnt the value and challenges of different approaches.

Strengthening community ownership is key for successful project activities

In both the West Bank and Gaza Strip, community ownership is one of the important approaches that has contributed to the success of the project interventions. In the West Bank, the APHEDA-MA'AN team realised the value of implementing tailored intervention activities for beneficiaries at the community level, not just at the household level. Access and management of water is a community issue and sharing infrastructure is a cost-effective way of improving food security. The water pond in Kufr Jammal and the water reservoir in Kur are responding to needs identified by the community and are community managed utilities, complementing the construction of farm water cisterns in the area. During the first six months of the fifth year of the project, the project team will assess community management mechanisms to maintain sustainable water infrastructures.

Consider water at all stages of the project, including design

In Khan Younis, an important lesson is to integrate water issues in the design of all project activities to support farming communities and households. Although there are significant challenges in the area of water, there has been a noticeable significant impact on farming livelihoods when the APHEDA-MA'AN project has promoted good water management practices that decrease losses of water and promote use of natural water sources (such as rain-fed irrigation and rain water collection ponds) which result in sustainable increases in food production and farmer income.

Project interventions, such as field crops and greenhouses, need to be accompanied with provision of water tanks, water ponds, or irrigation networks.

For example, in the future, APHEDA-MA'AN will improve access to good quality water in Khuza'a through a water pipeline and water reservoir that will support the irrigation of 1,000 dunums of currently empty land and boost food production in the village.

Quality of management as well as quantity of water

Water interventions are not just about increasing the total amount of water, but rather are about satisfying the specific water needs of beneficiaries. While some participants can best benefit from increasing the quantity of water harvesting, others can best benefit from enhancing existing water management systems. Other groups have most benefited from activities that have secured their access to water. MA'AN & APHEDA will continue to provide water interventions that satisfy the diverse water needs of beneficiaries, including addressing issues of supply, management, and access.

The APHEDA-MA'AN project will encourage farmers to take advantage of water infrastructure to plant more diverse crops to sustain more stable incomes. Severe flooding has devastated some farmer's crops, so rain water collection structures, such as cisterns and ponds, aim to mitigate this, as well as allow farmers to access stored water during the dry season.



Conclusion

Villages in Tulkarem and Khan Younis districts face interconnected, structural challenges of occupation that restrict basic access to water resources. On the local level, the respective regions experience the impact of restrictions differently. The APHEDA-MA'AN project employs a farmer, household, and community level strategy that responds to the water infrastructure and management needs of the specific village communities.

Rather than using short-term, humanitarian responses to food insecurity and vulnerability, APHEDA-MA'AN's activities such as cisterns and irrigation networks, are improving access to sustainable local, cheaper, and more efficient water resources that allow farmers to increase production for household consumption and sale in the community markets in the longer term. With a renewed sense of ownership of their farms, through household and community managed infrastructures, farmers can invest in their land. Stronger harvests and reliable incomes pull households and communities out of cycles of food insecurity and poverty by providing sustainable agricultural livelihoods.

Ultimately, the water crisis in the occupied Palestinian territories will only be solved by an end to the Israeli occupation in both the West Bank and Gaza Strip, including equitable access to shared hydrological resources. The APHEDA-MA'AN project is working with participants to improve water access and quality in the short term whilst laying the foundation for local water systems and water sovereignty for the future.

Case Study 2:

Food Production

Through a strategy of working on the individual, household, and community levels to promote local agricultural and community assets, as well as supporting sustainable agricultural practices, APHEDA-MA'AN interventions have enhanced food production, thereby improving food security and incomes for greater resilience and strengthened livelihoods.

Challenge

Low agricultural production in the occupied Palestinian territories leads to limited local food availability and poor incomes from agriculture, creating cycles of poverty, vulnerability and food insecurity. The constraints on farmers' and rural women's production are rooted in Israeli policy restrictions on Palestinian access to arable land and resources. Forty-three percent of West Bank land is allocated to Israeli settlements' local and regional councils, whilst 10% is trapped in the seam zone¹. Thirty-five percent of Gaza's agricultural land is totally or partially inaccessible due to Israeli restrictions² whilst the November 2012 Israeli war on the Gaza Strip caused USD \$93 million of damage to the agriculture sector³.

1- The area of land between the Separation Wall and the 1967 borders, Source: <http://newpal.ps/wp-content/uploads/2013/04/NEWPal-Land-Day-paper-final.pdf>

2- Five Years of Blockade: The Humanitarian Situation in the Gaza Strip 2012, Source: http://www.ochaopt.org/documents/ocha_opt_gaza_blockade_factsheet_june_2012_english.pdf

3- Palestinian Ministry of Interior, Source: [http://www.moi.gov.ps/en/news/36567/Ministry-of-Agriculture-losses-during-the-recent-aggression-\\$93-million](http://www.moi.gov.ps/en/news/36567/Ministry-of-Agriculture-losses-during-the-recent-aggression-$93-million)

Despite its significance in the economy, the agricultural sector also suffers significant neglect. In 2011, the agriculture sector did not exceed 1% of the Palestinian Authority's annual budget and accounted for only around 0.74% of international aid in 2006.⁴ Whilst the political roots of agricultural de-development are broader than can be addressed in the AMENCA2 program, APHEDA-MA'AN has designed its food production activities to improve food security and resilience of households and communities in the context of these constraints.

In the project focus villages of the districts of Tulkarem (West Bank) and Khan Younis (Gaza), the APHEDA-MA'AN baseline survey revealed that 56% of land owners could not derive income from their land. Forty percent and 69% of surveyed households in Tulkarem and Khan Younis respectively relied on credit to purchase food. Fifty-eight percent of households in Tulkarem and 43% of households in Khan Younis spent more than AUD \$450 on food per month, while 46% and 60% lived on less than this in Tulkarem and Khan Younis. Both areas are marginalised, but agricultural needs differ due to the distinctly different geography and population. The hilly topography and more sparse population of the Kafriyat Municipality means that farm lands are quite small and production is less intensive compared to Gaza, where the population is much larger and land is flatter. Increasing food production leads to lower food expenditures by households, increased nutritional diversity, and increased income from selling surplus produce. Communities benefit from localised markets, lower prices and increased food safety.

4- Al-Shabaka, Palestinian Policy Network, Source: http://alshabaka.org/sites/default/files/Abdelnour_et_al_PolicyBrief_Eng_July_2012.pdf



Project activities

Operating within these constraints, the APHEDA-MA'AN project uses a national-level approach, working across both the Gaza Strip and West Bank. In both areas, the APHEDA-MA'AN project identifies vulnerable households which are in need of urgent support. The project then supports farmers with appropriate assets, such as greenhouses, animal husbandry units or irrigation networks, along with training to increase food production and incomes. In addition, community-level infrastructures, such as water pipelines, cisterns, and agricultural roads, lay the foundations for sustainable increases in production.

Within this approach, the APHEDA-MA'AN project responds to the specific needs of Gaza and West Bank farmers and communities. The project ensures sustainability by tailoring each activity to local priorities, not imposing equations for food production on each area. For example, greenhouses in the Gaza Strip are much larger than in the West Bank, as much higher levels of production are required in Gaza to make an impact on household food security and incomes, as well as to increase the total amount of food available in the Gaza Strip in the context of the economic blockade. The topography of the

Tulkarem area means that larger scale and high-production greenhouse units are impractical; thus the project has instead focused on home gardens, beehive units, small greenhouses, land rehabilitation, and increasing access to land. The first three kilometres of agricultural roads in the project have enabled better access to around 1,050 hectares of agricultural land in the cluster of villages in Tulkarem. Land rehabilitation has been a focus in both the Gaza Strip and West Bank, where APHEDA-MA'AN has rehabilitated 121.7 hectares of land to date, sustainably increasing the amount of viable agricultural land.

Production has enhanced food security and household income levels enabling greater resilience at both household and community levels. The APHEDA-MA'AN project has increased food production in targeted communities by 77.7% in the West Bank and by 401.4% in Gaza (as measured against the baseline) in the fourth year of the project. In both areas, the project is focusing on support for women beneficiaries and other vulnerable groups. Through the project activities, women farmers in the target areas are able to contribute to the incomes of their households through production from a range of activities such as greenhouses and animal husbandry. The project enhances self-sufficiency by moving farmers and agricultural communities away from being just food purchasers towards being producers – creating high-quality harvests for household consumption and for local markets as well promoting low chemical usage to improve food safety. For example, participants in this project contribute 7% of total tomato production in the entire Gaza Strip. From an investment of around USD \$350,000 in direct production assets and inputs in the Gaza Strip, participants have yielded more than USD \$1.1m worth of plant and animal production in the fourth year of the project alone.

Agricultural roads also open up new arable land to lay the foundations for sustained increases in food production. It is estimated that 40% of agricultural land in the Tulkarem cluster of villages was under-served by roads before the project. After constructing 3km of roads, with a 20% community contribution worth almost AUD \$11,500, farmers are reporting that they are maintaining their land more often, are more encouraged to plant diverse crops, and they feel a greater attachment to their land, which is crucial to encourage reliance on improved agricultural livelihoods.

Results

West Bank

In the West Bank, APHEDA-MA'AN's food production activities are strengthening the resilience and livelihoods of households and communities. The strategy attempts to diversify livelihoods and promote local consumption. A significant amount of production is consumed by the household itself, as well as the extended family, whilst surplus produce generates income for other household needs. Increased food production reinforces the value of agriculture and agricultural livelihoods.

Mr. Rashid Toubeh

is 65 years old and was a participant for the agricultural land rehabilitation program in the first year of

the project. This allowed him to expand and invest in his farm, including rehabilitating 0.3 hectares of land with project support. Before this, "the land was full of rocks." He says "it was not suitable to grow anything". Rashid lost the majority of his fertile land behind the Separation Wall. Today his farm overflows with neat rows of thyme and beside them, trees of guava, fig, cumquat, and grape vines. It is clear that he depends on his land for his family's livelihood; he says he spends his day there tending to the field with his wife. Rashid and his wife have grown thyme for the fifth consecutive year. He is proud of his work, "people cut their thyme three times a year, I do four... I work hard, I do not stop." Although he continues to struggle with debts, he hopes that expanding his farm will support his ability to pay them off. Rashid and his wife produce 2,700 kg of thyme per year for a net profit of AUD \$8,691. His income supports the family's household needs, and keeps his daughters in school. He explains, "happiness is feeling you are able to support your family without help from anyone...I am an old man, I want my daughters to live with dignity before I die."

Mrs. Nahia Abdelrahman and **Mrs. Naela Mahmud Husni** are hard-working mothers and wives from Tulkarem and beneficiaries for small greenhouses. Naela is a mother of ten children; her husband is employed as a blacksmith, but his fluctuating income is unreliable and "some months he would earn nothing." Nahia is the mother of five children and her husband is a schoolteacher; his income however, is not enough





Women receiving training and beehives in the project also emphasise a renewed sense of control over their lives and the importance of the contributions they now make to their families' incomes and food security.

Mrs. Sajida Mohammed Jrais

participates in the beehive activities in Kufr Abboush. In two years, she doubled her number

to keep her two daughters in university. The challenges facing both women are immense -- putting fresh food on the table for their families remains a constant burden.

After Naela received the greenhouse, she produced 4,500 kg of tomatoes in one year, worth AUD \$1,764. These tomatoes feed her immediate and extended family and are gifted to less privileged neighbors. Naela sells two boxes every four days in the local market, providing a staple food for her village. Her income is allowing her to make investments in her children's future; "we are saving money for my son to open a stationary shop." Looking forward, Nahia hopes to be trained to use raised-bed planting systems that can save resources and space. Nahia comments on her new found place in society, "I am a farmer from the inside." The greenhouse "confirmed my identity as a farmer...people look up to me, they respect me, and see me as a woman who can produce."



of beehives from three to six and expects to double again this summer. In her first year, Sajida produced 47 kg of honey, worth AUD \$968. She sold AUD \$721 worth of honey, and kept the rest for the home. The higher income is allowing Sajida to make investments in her family's livelihood and improve their food security. Sajida used her new income to buy two pregnant sheep. After three years, there are now 16 sheep, seven of which were sold for a total of AUD \$1,853. From her initial investment from the honey income, Sajida is now expanding the assets of her farm. Neighbors and surrounding villages buy organic honey from Sajida, instead of the market in Tulkarem, where honey often contains fillers, water, and processed sugar. On the community level, women are providing clean, local, and high-value products in the market and diversifying their incomes.



Fawzia Oudeh,
from the
village of Al-Ras,
in Al Kafriyat, WB.
has been able to
generate income
from the beehives
she received from
the program in

Year 2. In June 2013, Mrs. Oudeh harvested over 40kg of honey worth AUD 608.

Gaza Strip

Mrs. Fatoom Qudeih is from the village of Abasan. Her husband is unemployed and supporting her seven children and six grandchildren is nearly impossible. Her hands and feet swollen from her work, Fatoom sits in the one bedroom home in which her entire family lives, and explains her story. While her sons find intermittent work, income for her family has typically been less than AUD \$147 a month, or nothing at all. Fatoom has received a chicken unit (including coop, equipment, chicks, and training) and cares for the chickens with support from her husband. The family was also provided with a baby greenhouse in which they produce enough tomatoes (one of the main staple foods for Palestinian households) for the entire family.

So far, she has sold 170 chickens and kept 20 for the home. She distributes others as gifts to neighbours in need. Despite the challenges facing her family, Qudieh not only supplies a clean source of protein for her own family, but also sells a local food source in the community. With AUD \$235 a month in additional income, Qudieh can purchase needed medicine and is increasing her family's self-sufficiency by planting tomatoes on her land. She is also saving for her children— "the income encouraged me to save a small amount each month so that my daughter can attend university next year, she is an excellent student and I do not want her to lose the opportunity for an education." As a women breadwinner, Qudieh explains her new sense of confidence and strength, "after I fell ill, I suffered psychologically because I felt I was a burden to my family, but now I am productive again." Qudieh's story highlights

how the APHEDA-MA'AN project's agricultural activities are improving food security at household and community levels and decreasing vulnerability by promoting accessibility to local, clean food sources and stable incomes, and strengthening the role of women.

Mrs. Ahmed Ibrahim Qudieh

from Khuzaa in Khan Younis supports his family, including his 16-year-old child with a spinal injury and another ten-year-old child with retinal detachment, both of whom require regular medical attention. Ahmed cannot find work in Gaza, and relies on his land for his family's livelihood, planting wheat because his greenhouse was damaged and unusable. As a seasonal crop, the wheat did not provide enough food or income to support his family year-round. He says, "Doctors prescribed medicines for my sons, but I could not afford them." After receiving greenhouse maintenance through this project, he successfully harvests tomatoes. Selling more than twelve tons of tomatoes per season, he has increased his income from AUD \$59 to AUD \$235 per month. Now, Ahmed says "I am more able to pay for the treatment of my sons." In addition, in the fourth year of the project, there was support to Ahmed's wife, Suad, to rehabilitate a barn on their land. She then bought a sheep and chickens to provide food for the family. She and her husband can now send their son back to university. He had previously dropped out due to lack of funds. The APHEDA-MA'AN comprehensive approach to activities is directly addressing sustainability in food security and livelihood security by supporting individuals like Ahmed to make investments in his land and ultimately, his family.



Lessons Learned

Agricultural development in a situation with so many restrictions has not been without its challenges, from which the project has learnt. There are a number of lessons from project work in Tulkarem and Khan Younis, primarily about how to integrate sustainable design into activities to ensure long-term impacts on household and community food security. The fourth year saw a change in strategy in the Gaza Strip to ensure participants were genuinely achieving food security. Packaging or linking activities together has been an important change; for example, greenhouse maintenance in Gaza includes the provision of seedlings and irrigation networks; animal husbandry units are paired with home gardens where appropriate.

The APHEDA-MA'AN project workers visit beneficiaries from previous years on a regular basis, assessing sustainability results of the interventions and providing additional support, especially in agricultural technical advice. These visits coincide with the regular facilitation provided by village support committees, which ensures that resources are available to beneficiaries. In the Gaza Strip, for example, these visits identified a high failure rate for the rabbit units as a result of a virus. The project then shifted the animal husbandry activity to chicken units, including veterinary support which has proven to be a success.

APHEDA & MA'AN are also learning to adapt project activities to address emerging challenges. In Gaza, the project will transition home gardens from consumption units to production units and further promote

intercropping among land rehabilitation participants to better preserve natural resources and increase production year-round. The project needs to work with the community to find solutions to deepening problems such as salinification of soil and a lack of fresh water.

In the West Bank, the project needs to assess how to increase the production of mini-greenhouses by introducing new technologies such as raised beds and by minimizing insect infections. The *tuta absoluta* moth has affected some greenhouses, especially those planted with tomatoes, leading to a shorter harvesting time and reducing production quantities. More coaching on insect traps will be provided to beneficiaries on how to avoid and handle crop diseases.

The project has also learned the value of both short term and long term activities, particularly in this year as land rehabilitation beneficiaries from the first year are able to begin harvesting their olive trees, which typically only yield production four or five years after planting. In the future, the project will encourage beneficiaries of land rehabilitation to actively intercrop the olive saplings to have more immediate food production benefits.

Conclusions

Tulkarem and Khan Younis face interconnected, structural challenges of the occupation and a lack of investment that restrict food production capacities, but they experience them differently. The APHEDA-MA'AN project operates on a national level but also localises support. The overall strategy is to support vulnerable households to increase food production through agricultural assets and training. This is then enhanced through community-level inputs, such as through water infrastructures and agricultural roads to support regional food production into the future.

The different approaches taken in the Gaza Strip and West Bank have been evidenced by strong results. Very high production in the Gaza Strip is required to achieve food security and increase overall food availability in the context of the blockade, whilst smaller scale activities, such as animal husbandry, provide targeted support to increase incomes. The project continues to make very high contributions to food availability in the project areas in the Gaza Strip.

A diversification approach and a greater focus on agricultural infrastructure (such as water and roads) are delivering for communities in the West Bank. Households are benefitting from small scale food production units, such as mini greenhouses, while benefitting from larger infrastructures such as reservoirs and agricultural roads.

APHEDA-MA'AN's community and household level agricultural activities are sustainably improving food security by increasing household consumption of higher quality, healthier produce and are building community resilience by developing markets for clean, locally-grown crops. Women are reporting economic empowerment through their specific activities, such as beekeeping. The renewed sense of self-sufficiency and connection to land and resources, through household and community-managed infrastructure, allows farmers to reduce vulnerability and increase food security, and thus fosters confidence to stay on the land.



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