Tackling Environmental Challenges

For a Sustainable Palestinian Future


By Zayne Abudaka and Hammam Othman

Palestinian life is filled with cultural references that tie Palestinians to their "natural environment." The olive tree has become a symbol of Palestinian steadfastness, and hardly a day passes in Palestine without a reference to the land, sea, and air that Palestinians have been denied. Despite the patriotic slogans, however, speaking about the environment and climate challenges is considered to be a luxury in many Palestinian communities. Decades-long occupation has clouded most of the discourse, with many Palestinians considering any other conversation to be secondary or "less important" at best, and "imported" or "Western," at worst.

This understanding of the environment is extremely problematic, mainly because it ignores the importance of environmental and resource sustainability to Palestinian liberation from occupation, dependency, and underdevelopment. While Palestine's contribution to global greenhouse gas emissions is miniscule, the impact of climate change in Palestine is expected to be severe. In Palestine and the region, the combination of rising temperatures and decreased rainfall is expected to dramatically increase demand for water, which is an already scarce resource, inflicting significant harm in agricultural production capacity. Combined with the impact of Israeli restrictions and settlement expansion on the water resources and land area available for agriculture, climate challenges are expected to have catastrophic implications for food security in Palestine. For this reason, efforts that focus on improving food security and sustainability in Palestine and the region are likely to intensify.

Despite the absence of a clear and systematic approach to addressing environmental and climate challenges at the national level, a number of renewable energy, water treatment, and waste management projects have been developed with support from the Palestinian government and international donor organizations that today form the seed for environmental transformation. The development of these projects has mainly been driven by the need to ensure the sustainability of vital resources such as energy and water at an affordable cost. To build on existing efforts, more actors need to pay attention to resource sustainability in the agriculture sector.

Environmentally friendly agricultural ventures can preserve the environment, strengthen resilience against the occupation, and generate income for thousands of Palestinians.

Out of over 5 million Palestinians in the West Bank and Gaza, around a third (1.7 million, mostly in Gaza) are food insecure, and a further 16.8 percent (841,000) are marginally food secure.[i] Food insecurity is only expected to increase due to population growth, increasing international commodity prices, and Israeli restrictions on trade (and associated costs), in addition to the reduced capacity for food production due to shrinking land area and water reserves.

Palestinians in the West Bank and Gaza import most of their food, while their ability to produce their food on their land is increasingly constrained. To ensure food security, Palestinians have little choice but to adopt technologies and practices that can radically improve conservation of soil quality, water resources, and other agricultural inputs. This could enable the sector to grow sustainably to serve a growing population despite the challenges. Adopting more advanced technologies

Plastic bags placed on arcuate *faqqous* grown in the town of Deir Ballout in the Salfit governorate. Photo by Daoud Abdallah, Palestinian Assembly for Photography and Exploration.

As Palestine must deal with occupation-related restrictions and is expected to be particularly hard hit by global climate change, the development of sustainable agriculture value chains is crucial to ensure food security.

and cultivation methods such as hydroponic farming, vertical farming, and fully controlled and monitored environments (greenhouses), can help farmers produce three to six times the amount of produce, with significantly reduced water use and minimal levels of harmful chemicals. Hydroponic cultivation, for example, can save up to 95 percent of the needed water for growing greens and a range of vegetables, including widely consumed, water-intensive crops such as tomatoes and cucumbers.

Despite the great potential of agricultural technology in the Palestinian context, there are several challenges that impede its development. Advanced agriculture is capital intensive and requires tight operational management and specialized expertise, which is often lacking in the local market. The availability of risk capital to invest in agricultural technology development can significantly expedite the pace of transition.

Many Palestinians in the West Bank remember the images of cucumbers being disposed of in empty agricultural areas in Tulkarem during 2020. The dissemination of the images on social media channels triggered a public conversation. Farmers reported their inability to sell their produce as storage costs mounted, leading them to dispose of the produce.

Difficulty in selling produce is a major challenge for farmers in Palestine and worldwide. Farmers often lack access to the networks, knowledge, or time to ensure that their produce reaches customers. Marketing and sales require time

Dumping of agricultural produce in Tulkarem, Palestine, 2021.
Photo courtesy of Ultra Palestine.

and access to networks of resellers, wholesalers, and in some cases consumers directly. When farmers cannot access a feasible sales channel, they dump their produce to avoid costly storage. In addition, the fluctuation in agricultural production, which is mainly caused by seasonality and the inability of markets to allocate produce rapidly and at a satisfactory price for both the farmer and the consumer.

In our region, where the movement of people, products, and capital is restricted by layers of politics and bureaucracy, shortening supply chains could contribute to improved food security and the development of local productive industries, while playing a part in the region's adaptive response to climate change. To allow for this gradual transition towards shorter supply chains, actors should pay more attention to improved efficiency and planning of the cultivation process to improve the management of supply quantities to match the less fluctuating demand.

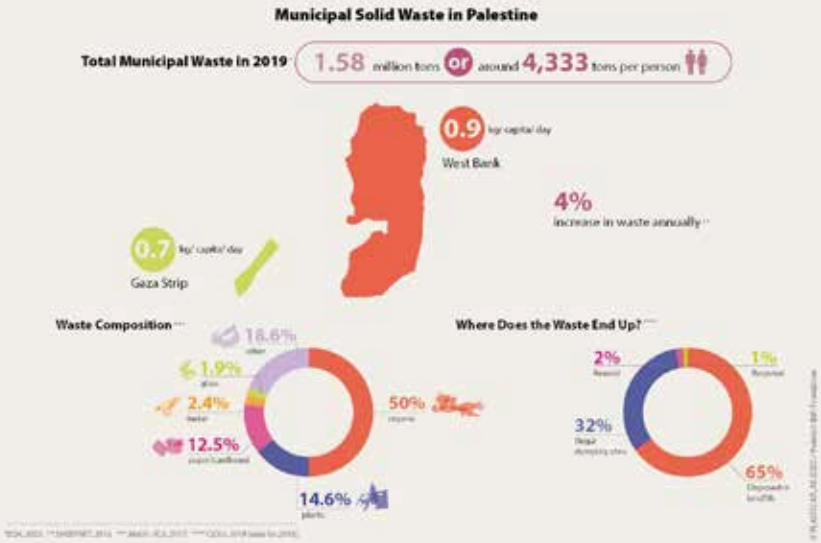
Planning can be further improved through the adoption of advanced cultivation technologies. One advantage of controlled cultivation systems is that they enable farmers to grow crops during most of the year with shorter cultivation cycles. This allows farmers the flexibility to adjust their cultivation strategy throughout the year to smooth fluctuations in demand and supply.

Sector stakeholders should also focus on innovative solutions to boost farmers' access to local markets and reduce the number and control of intermediaries in the supply chain. With improved public access to the digital world, new tools could be leveraged to better link farmers to traders and even to

From the farm to your plate: Palestinian farmers face difficulties in their efforts to gain access to markets.

the end users directly, circumventing traditional open markets where producers have to compete with local representatives of much larger Israeli producers. In addition, using controlled cultivation systems could help farmers produce much higher yields on smaller plots of land, with reduced need for agricultural inputs such as soil, fertilizers, and pesticide. This enables farmers to set up farms closer to the urban markets which they serve.

Importing agricultural inputs remains a significant cost for the Palestinian economy. In 2019, animal feed was Palestine's third largest import in terms of value, with around US$204.6 million (9.6 percent of total import bill and 1.3 percent of GDP in 2019) spent on imported preparations used in animal feed. In addition, conversations with local producers of animal feed indicate that most of the inputs used in local production of animal feed are also imported from or through Israel. In the same year, the value of imported fertilizers reached US$9 million. Although this amount is much smaller when compared to animal feed imports, the official figures are likely to be skewed due to the informality of fertilizer purchases from Israel. Israel currently bans standard concentration fertilizers typically used for intensive agriculture; this continues to be a



Municipal solid waste statistics in Palestine, 2019. Photo courtesy of Heinrich-Böll-Stiftung.[ii]

major impediment to the sector's development and drives farmers to avoid reporting purchases of fertilizers outlawed by Israel.

The increase in input prices is one of the main issues that face the agricultural sector in Palestine and is sometimes the main reason behind the losses incurred by farmers. Farmers report increases in input prices over the previous years with an average annual growth of 10 percent. The reasons behind the increase include the fluctuation of the dollar exchange rate against the Israeli shekel and increases in petrol prices. In addition, trading in pesticides and fertilizers is limited to a number of trade agencies that import heavily from Israel and control final prices for Palestinian users.

Palestinians in the West Bank and Gaza generate a significant amount of organic waste; around 50 percent of the 1.58 million tons of daily municipal solid waste in the West Bank and Gaza is considered organic waste (790,000 tons). Organic waste from both households and the agricultural sector can be an important input to produce some of the most essential products needed to establish a sustainable agriculture sector, such as animal feed and fertilizers.

[Municipal Solid Waste photo]

Developing fertilizers and animal feed products from locally sourced organic waste can unlock a structural challenge for the development of Palestinian food security. Relying on by-product from local industries, resource-dependency on the Israeli market could be challenged while also growing local businesses and creating jobs for Palestinians. The local production of agricultural inputs can also significantly contribute to the shortening of supply chains, which result in savings in time and money required from farmers and a reduction in the carbon footprint associated with transporting produce.

To develop new agricultural inputs locally, a number of efforts need to be coordinated among key sector actors. Seed capital is needed to conduct research and test different combinations of inputs in order to identify products that are at least equivalent to imported options, in terms of price, quality, and nutritional value. To ensure feasibility and scalability, large local actors such as private-sector dairy producers, larger agribusinesses, and the government should be the first to adopt the new local products.

Examples provided in this article are not an exhaustive list of possible interventions nor are they a silver bullet that promises to solve all of Palestine's problems. We believe, however, that by investing in resource sustainability, especially relating to food security, actors will ultimately strengthen the resilience of Palestinians living on their land and provide them with more agency over their own well-being and development.

The road to change is not going to be easy. The transition will require large amounts of capital, specialized expertise, innovative business models, and most importantly, the will and determination of the various actors in the agricultural sector.

To start addressing the challenges cited above and other social and economic challenges in Palestine and the region, we propose a scientific approach, anchored in continuous testing and validation to ensure its fit to the local context. We must strive to understand the problem by researching pressing environmental challenges and measuring their impact on Palestinian society and economy. Sizing the magnitude of the problem and identifying the key affected actors are critical first steps to engaging policy makers and the private sector in efforts to respond quickly and effectively to climate challenges. Efforts must be made to identify potential solutions through studying international similar experiences and drawing lessons from similar contexts. Pilot projects must be developed to test the compatibility of proposed solutions and carefully situate them in the local context. And we must invest in scaling up successful pilots to become sustainable impactful businesses.

Zayne Abudaka is the director of research at Momentum Labs, a start-up studio and boutique consultancy that works at the intersection between technology, business, and social impact. Zayne is an economist with a passion for nature, technology, and social justice.

Hammam Othman is the director of operations at Momentum Labs and has extensive experience in operations management, HR management, and start-up development.

[i] "2020 Global Report on Food Crises, Food Security Information Network," available at https://www.fsinplatform.org/sites/default/files/resources/files/GRFC_2020_ONLINE_200420.pdf .

[ii] Nidal Atallah, "Palestine: Solid waste management under occupation," Heinrich Böll Stiftung, October 7, 2020, available at https://ps.boell.org/en/2020/10/07/palestine-solid-waste-management-under-occupation .