



A Roadmap for Agribusiness Development in the Occupied Palestinian Territories

*An analysis of the Vegetables
& Herbs, Dairy, and Sheep &
Goats subsectors*

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Important Note

The study team that produced this report was led by a TechnoServe consultant who was unable to complete the study due to severe health challenges. As a result some of the explanations of the impact calculations and data sources in the study are less well described than desired. At the time of submitting this report, we are still hopeful that this situation will change and we will be able to produce a data annex to this report with fuller explanations.

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1. Executive Summary

Overview of Recommendations

The Occupied Palestinian Territories (oPt) has the potential to establish a vibrant and profitable agricultural sector. A range of private and public efforts has demonstrated strong potential and that growing markets can be unlocked. Donors have supported expansion of agro-processing capacity and access to technical solutions over the past few years in key sectors such as export vegetables and herbs, olives and dairy. However, despite the underlying good intentions, the installed capacity remains under-utilised and significant potential unexploited. The supply base remains weak and disorganised and the vast majority of poorer Palestinians are yet to benefit.

This is principally due to various on-going weaknesses of the local market systems:

- The **processors and exporters** lack the knowledge, adequate incentives and understanding of how to mitigate the risks of bringing the small producers into their supply chains to optimise their capacity utilisation and improve their competitiveness, and to overcome barriers of mistrust and negative perceptions from their potential small farmer suppliers. They also lack skills to consistently and reliably supply top quality export markets.
- **Smaller farmers** are unable to respond to the market-pull from larger processors and traders. They lack the skills, knowledge, organisation and assets to consistently produce the variety, quality and volumes of products needed to increase their share of export and local markets; producing low quality, low margin, inefficiently distributed products for the local market.
- Very significant political and structural challenges constrain the **enabling environment**, such as restricted access to water and fertilisers, and border logistics. The resulting inertia has yet to be addressed through a comprehensive, coordinated and co-owned response.

This report focuses specifically on how to work with leading private and public sector actors to develop markets and capture opportunities for smaller Palestinian producers within the agriculture sector. It recommends measures that will fundamentally change the dynamics of how smallholders are integrated into markets. An improved and attractive inclusive market system will emerge that will simultaneously attract more investment and create improved incomes and livelihoods for thousands of poor female and male producers. Nonetheless, it will take time. A five-year programme that starts in early to mid-2012 will start to deliver increased volumes and improved quality to the market in 2013. Neither the report nor the recommendations tackle the broader issue of the overall optimisation of agricultural production and value addition in oPt.

At a high level, the story presented in this report is that: 1) the market system is failing to create effective opportunities for small farmers due to market failures in the way that such farmer's link (or not) to the market players and 2) the solution requires addressing both the demand and supply sides of the market. A strict focus on behaviour change for the major market participants, such as input suppliers, processors, traders, wholesalers and exporters, will be unlikely to succeed, as they will remain hesitant to engage with a supply base that lacks knowledge, skills, trust and an ability to grab onto economies of scale to address unattractive costs. Any intervention needs to provide significant "push" from the small farmer end in terms of support for improved farmer organisations, and producer access to support, inputs, training/extension, etc. in order to help them become more "market ready", and able to assess and accept opportunities to engage with the larger players.

Those larger players need incentives, and in some cases some short-term support, to be able engage with them as suppliers (or customers, for the input suppliers). At this stage, on the basis of available information, it premature to say which of the established market players will be best positioned to lead improved engagement with the small producers. That will have to be understood better during any new interventions by trying a range of different approaches to incentivise them to engage more readily.

Broad in scope, this report also varies in its depth on the many issues it covers. Due to the shortage of time and limited resources available, there are many interesting areas that the study team was not able to fully explore. These include, in particular, the dynamics of the local vegetable market. Given estimates that in the short-run at least, there are limited domestic growth or import-substitution opportunities in this sector, it was deprioritised in the selection phase of the study, in favour of better opportunities in export markets.

The recommendations for action can be split into those that address core cross-cutting issues and those that focus on issues specific to the three high potential sub-sectors that were agreed to be the focus of the study: vegetables (and herbs) for export and local markets, sheep, goats and dairy for the domestic market. These sub-sectors can become role models for the broader integration of smallholders into agricultural markets and transformation of the entire agricultural sector.

Addressing the three groups of key weaknesses, as above, and building on relevant international best practises, the core recommendations can be listed as follows:

- **Channels to market (processors and traders)**
 - Incentivise existing investors to improve their engagement with smaller suppliers through competitive processes that reward purchase commitments, provision of inputs and advice, and transparency in engaging with the suppliers.
 - Attract new investors who are ready to commit to targeting new higher value markets and sourcing from smaller suppliers with packages of limited market and credit support
 - Encourage traders, wholesalers and exporters to convene and lead member-based sectoral level organisations that can strengthen their value chains, through for example exploring and supporting the development of oPt brands, and advocating for an improved regulatory environment.
- **Smaller farmers and their organisations**
 - Use attractive business cases to mobilise farmers, initially the more advanced and entrepreneurial, and incentivise them to engage with training in financial literacy, business skills and improved agronomic and farming practises – with a particular focus on addressing women’s needs.
 - Incentivise them to aggregate into business groups, either using existing structures or creating new ones. Attract service providers to support the groups’ capacity building in governance, transparency (supported by audits) and management.
 - Convene partners to facilitate the farmer groups’ access to inputs, finance, market and other relevant information (e.g. weather, agronomic advice) and assets such as improved greenhouses and milk bulking and chilling plants, in coordination with the processors/traders and public institutions.
- **Enabling environment**
 - Incentivise Palestinian financial institutions to innovate in their service provision to improve credit products for small farmers (including special products for women building on what typically is their better creditworthiness, but poorer access to collateral). Farmer organisation and financial training should complement this,

capacity-building of financial institutions to analyse and rank the credit-worthiness of agricultural investments.

- Incentivise the development of small-scale water resources by smaller farmers and their cooperatives such as cistern construction, distribution and irrigation equipment in relevant areas of Area A and B. Incentivise efficient use of public water by exploring the feasibility of introducing water metres and fees for use. Advocate access to Area C land for water development.
- Advocate for more favourable access to fertilisers and other inputs subject to regulatory constraints.
- Encourage the establishment of sub-sectoral business service providers by clarifying demand for their services from the growing farmers and their organisations. Private service providers will be encouraged where possible (such as exporting packhouses providing inputs and services on credit, or input providers supplying extension messaging). Some services will have to be the domain of public agencies (e.g. for local standards development and food safety).
- Improve the information available about the agriculture sector through support to the Palestinian Authority to improve overall agriculture sector information, and by incentivizing private actors to introduce market information systems (especially using mobile platforms).

In addition, a number of sub-sector specific recommendations round out the list.

In order to be able to estimate a potential return on investment from a sectoral transformation programme based on these recommendations, the following figure summarises modelled projected impacts in the three priority sub-sectors over a five-year period (not including benefits to other sub-sectors from adopting the cross-cutting improvements). The intention is not that these would be finite impacts, but rather the first steps in a broader process that would transform the sectors entirely – reaching tens of thousands of producers in the years beyond.

	Vegetables	Sheep and Goats	Dairy
No. farmers	4,000	4,000	750
Change in income per family (\$/year)	2,600	750	2,900
Total value created (\$M incremental)	\$30.4	\$13.9	\$8.8

Figure 1.1

At an estimated programme cost for the five years of around \$12m, this level of impact would lead to an expected return in excess of 4:1, if we simply divide the incremental revenue by the programme cost. This excludes significant positive externalities, such as the demonstration role modelling to other investors and farmers, which would increase the return. It also excludes, however, the potential need for guarantees for loans and other supports for access to finance that may need to be used during the programme.

Implementing a programme building off these recommendations would transform key value chains, build more competitive trading, processing and exporting businesses, develop role model commercial farmers and farmer organisations, and pilot/demonstrate successful market linkages for market take-up and expansion/replication. It would result in stronger private and public Palestinian institutions supporting and servicing the more competitive businesses within the target sub-sectors

and for agricultural development more generally, and lay the foundation for increasing scale and replication of the achievements beyond the five years. Future expansions of processing, food manufacturing and exporting will create the potential for significant numbers of new jobs in addition to spreading the growth to more producers.

Context

This report presents the findings from an 11-week study (June-September, 2011) of the Occupied Palestinian Territories' (oPt) agricultural sector. It was funded primarily by DFID's Facility for New Market Development (FNMD), with additional funding from the Portland Trust, and conducted on behalf of DAI by a team led by TechnoServe and comprised of representatives from Horizon for Sustainable Development, Oxfam GB, Moon Valley, Portland Trust, and Oxford Policy Management. It faced significant challenges when it came to data availability and coherence. Indications are made of the most consequential incidences of this throughout the report. Measures are recommended to improve this state of affairs in the future.

History and Overview of Agriculture in oPt

For more than 3,000 years, agriculture has been playing a major role in the oPt region. Today it symbolises resilience against land confiscations and Israeli settlement activity and provides protection against reductions in income and food insecurity during times of crisis.

An overview of oPt agriculture reveals that:

- Agricultural land represents 15%-30% of the total oPt area.
- The sector is an important source of employment, especially for women (13% of the Palestinian employees work in the sector, and up to a third of employed women). It contributed 6% (\$360 million) to the total 2010 GDP.
- Agriculture is a critical foundation of Palestinian existence: 4 out of 10 people are food insecure and rely on improvements in local agriculture to increase food availability, access, and utilisation.
- The sector is dominated by West Bank production (more than 90% of cultivated area, largely dominated by olive production), but Gaza's high value vegetable and field crop production nevertheless contributes a third of oPt agricultural GDP.
- Livestock production is dominated by poultry and sheep and goats (contributing c. \$170 million and \$180 million of value (in 2008), respectively), and cattle including dairy (c. \$90 million).

Sector-wide Characteristics, Challenges and Opportunities include:

- A heavy reliance on imports for nearly all inputs, several of which are heavily constrained or banned (e.g. many fertilisers) under the terms of the occupation, and almost all of which must pass through Israeli middlemen.
- In particular for water, scarcity, access difficulties, and poor or variable quality.
- Production systems that are fragmented (small holdings and mixed cropping driven), of highly variable productivity and underpinned by particular and long-set systems of traditional beliefs and practises.
- A history of farmers' organisations that were not established and have not functioned for commercial purposes. Apart from a few exceptional examples in Gaza, they do not assist farmers in engaging effectively with suppliers of inputs and finance, or output markets.

- A processing and packaging sector that is either dominated by large operators operating sub-scale (The Sinokrot Group in herbs and vegetables exports, operating at around 33% capacity; 10 large industrial milk processors operating at around 45% capacity), or processing and packaging occurring minimally - if at all - at the local level.
- A domestic marketplace comprised of fragmented retail supply at shops and stalls (hardly any supermarkets) and 9 pop-up wholesale markets without professionally run wholesale businesses at their core; A small export market primarily controlled by the major packing houses – mostly destined for Israel and Western Europe.
- An enabling environment suffering from poor (underfunded, low skill) extension services; little to no access to finance for both farmers and intermediary businesses due to failures on both the demand and supply side of the financial services market; relatively good road infrastructure; and, a healthy and growing level of institutional support provided by the PA, civil society and NGO sectors.

Despite these challenges at a high level, the report describes three types of overall opportunities for improved value creation in oPt agriculture that will benefit smallholders, and women in particular:

- Increased sales to domestic consumers – through import substitution, domestic value chain rationalisation, and market growth potential.
- Increased export sales – achieved by diversifying export market channels, aggregating farmers for efficiencies of training, supply, and market access, and targeting new and more accessible growth markets.
- Increased marketplace efficiencies in both domestic and export market access that see more margin captured by small producers – by introducing standards, grading and traceability (among other) practises, organising farmers into aggregated groups for input and output market access, and helping firms collaborate via development of industry membership based organisations.

Recent Development Activity in oPt

Relative to its size and population, the oPt benefits from considerable funding to all sectors from a broad range of donors. Significant and direct funding of agricultural development is mainly shared by the official development and aid agencies of: the USA, the EU, FAO/UN, Japan, UK, Netherlands, Switzerland, France, Italy and Canada. Since at least 2003 funding in the hundreds of millions of dollars has been directed to projects with focuses including but not limited to:

- Technical assistance, technology transfer, capital investment and market access assistance (including GlobalGAP compliance) for oPt agribusiness partners
- Grant funding for greenhouses, water management and irrigation
- Financial access and loan guarantee funding
- Trade facilitation
- Rehabilitation and strengthening of the olive and ruminant sectors

Development efforts to date have had to contend with a fluctuating political environment. They have made good progress on specific and shorter-term objectives in that context. In order for the capital, marketing channel, and export access investments that have been made to date to pay off, and to have them used at capacity, further attention is now needed on finding ways to help and incentivise many small farmers to participate in the supply chains of greatest opportunity.

Sub-sector prioritisation and focus

After screening 24 oPt sub-sectors for highest commercial and social potential the study conducted detailed analyses of three sub-sectors: Fresh Vegetables, Dairy, and Sheep and Goats, and lighter analyses of Herbs (with similar systems and issues to vegetables) and Olives (which have been widely investigated before). The analyses identified improvements that would help achieve growth and favourable value distribution for small farmers and women in each of the target sub-sectors.

In the main report we present each of the priority sectors' cases in turn, as we do here in the Executive Summary. In addition, in the main report we present the cross-cutting initiatives as a separate chapter (Chapter 10) given the importance and commonality of those issues across the three highlighted sub-sectors. To save space in the Executive Summary we have embedded the cross-cutting initiatives in the account of each focal value chain. The cross-cutting initiatives are: (1) strengthening farmers and their organisations (2) strengthening and diversifying oPt processing and market channels and (3) improving oPt Agriculture's Enabling Environment – including especially: financial services; water supply; extension services and training; private business service providers; access to agriculture related information and market information, and; market regulations.

The Vegetable and Herbs Sub-sector

Overview

Vegetable production accounts for more than half of the volume and value output of plant crop production in oPt. The most significant of these are tomatoes, cucumber, eggplant, and squash, totalling in excess of 75% of oPt's vegetable volume and value. Production is fragmented. It is estimated that small farmers represent 80% of the total number of farmers, but account for less than 50% of the total production. A small farmer is defined as cultivating up to a combined total of 20 dunams of open field, and/or 3 dunams of greenhouses, per year

Domestic demand for fresh vegetables has been growing slowly, driven mainly by population increase - per capita consumption of vegetables has remained flat. Small farmers' only experience is supplying this local market. This they do at low margins, with low quality products. While production has been increasing, there is no significant opportunity for import substitution, so growth can only accelerate with increased exports. Nonetheless, urbanisation has been progressing rapidly – from 47% of the population in 1997 to 69% in 2007. As yet, buying patterns remain traditional, with 63% of consumers buying their vegetables from local markets and roadside stalls. Very few modern supermarkets have yet developed. Modernisation is held back by a lack of uniform produce marketing standards across oPt.

The herbs sub-sector in oPt is characterised by a clear distinction between the domestic and export market, both in terms of channels (the export market is being supplied by dedicated medium and large farmers) and in products (the varieties demanded by the export market are in most cases different from the ones produced for the local market). While exports have helped fuel dramatic sectoral growth over the past decade, there have been very few cases of small farmers being involved. Efforts to expand the herb supply chains to include more small farmers have failed, due primarily to gaps in quality expectations and capacities, production and delivery planning, and essential levels of trust through the value chain.

Opportunities

The key opportunity in the domestic market is to improve efficiencies of market access through modernisation of the domestic wholesale and retail sector, with shortened links from increasingly demanding and rapidly growing numbers of urban consumers to more capacitated small farmers. This will need a comprehensive multi-stakeholder initiative that will look at improving market

regulation, standards, infrastructure, and physical marketing arrangements. A more detailed analysis of the domestic market is required to fully understand the local market dynamics and understand to what extent the supply chains can be shortened given the prevailing political economy among the local traders and wholesalers. Strong farmer organisations can reap economies of scale in input and output market access, improve farmers' bargaining power in the local supply chains, help them potentially purchase trucks, and achieve operational efficiencies at reduced transaction costs. This can provide a pathway for them to build their capacities and become viable suppliers to the export market.

There is limited opportunity to expand into the Israeli market, given Israel's own sophisticated production capacities. Export tonnages from oPt are currently around 60,000 tonnes, half of which are cucumbers. The challenges in the short term are defending and preserving current export volumes to Israel, and risk from Israeli dumping into oPt markets, rather than pursuit of growth. Nonetheless, improved competitiveness will position Palestinian suppliers to take advantage of growth opportunities when they arise in the future.

The most attractive opportunity over the longer term is to competitively address the growing demand from markets in export markets such as Europe, Central Asia, and the Gulf. While the export market offers higher prices, it also demands higher quality and food safety standards. This is especially relevant for the West European market and, to a slightly lesser extent, to the market in USA. Examples already exist of Palestinian producers proving to be competitive in these markets, and of these markets having the appetite for fresh vegetables and herbs produced in oPt. As a "step-up" opportunity, given their more relaxed quality requirements, greater success might be achieved in the shorter term in markets in Central Asia (mainly Russia, Ukraine, and Bulgaria) and the Gulf region (mainly Saudi Arabia and the United Arab Emirates).

To quickly achieve success, existing export players could pull more supply from more advanced growers. Given the delicate nature of herb production and post-harvest handling, and lack of familiarity among producers with export quality demands, it is likely to take longer to realise significant gains from herbs. Bottlenecks to achieving these opportunities are displayed in the following figure:

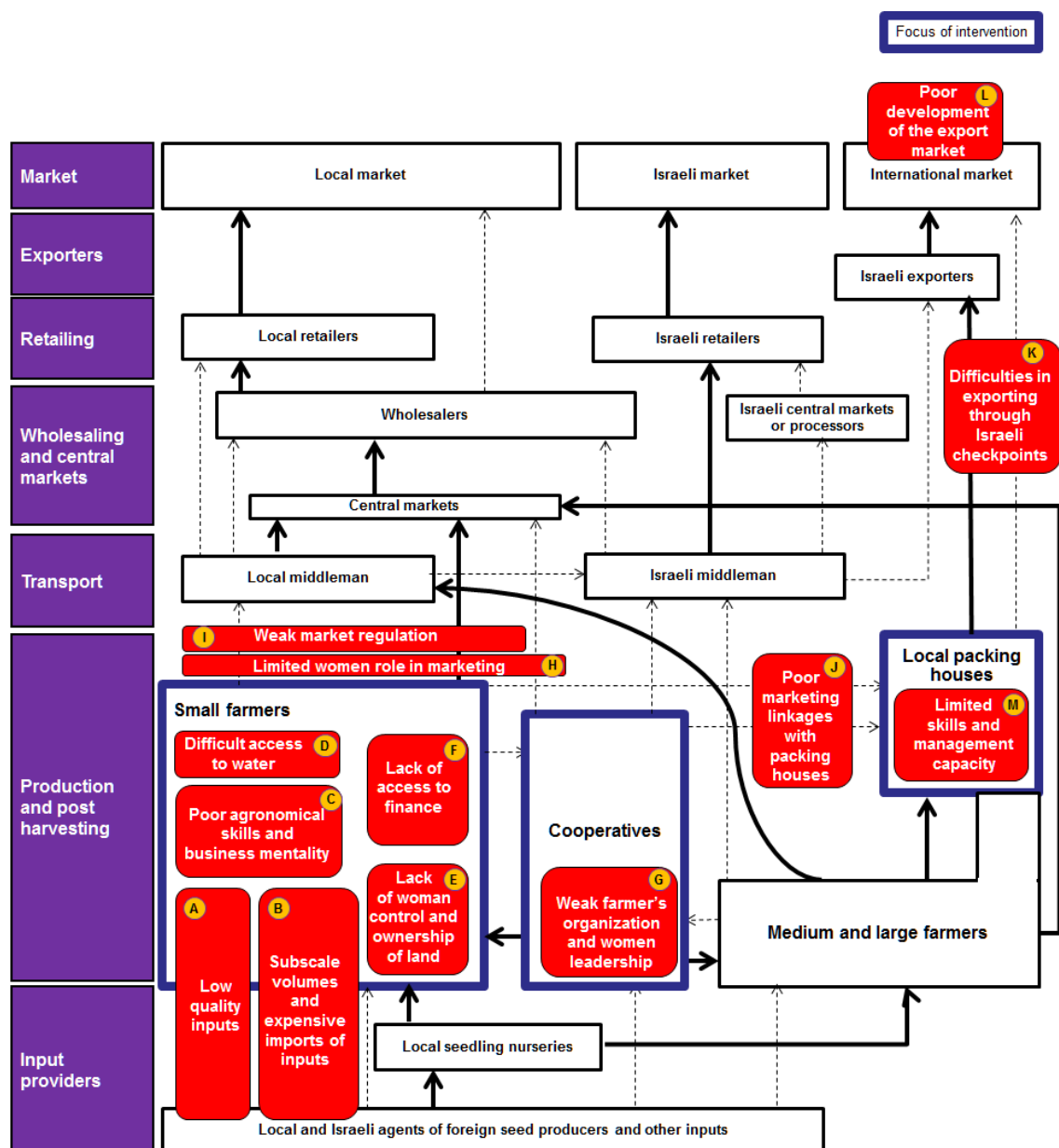


Figure 1.2

Recommendations

The study's recommendations focus on unlocking the sub-sector's potential benefits for small farmers (mindful that they are a diverse group -- ranging from those already commercially growing for export markets to those focused on producing for family subsistence). While the recommendations are also applicable to herbs, the initial focus should be on vegetables – extending to herbs as the various cohorts of farmers prove their competitiveness. The major recommendations are:

Channels to market

- Incentivise the greater streamlining of and efficiency improvements in supply chains to the more modern domestic market outlets (wholesalers and emerging supermarkets).
- Incentivise packhouse investors to continue to develop their quality management and export operations, as well as to reach back to the smaller suppliers with appropriate quid pro quo's – such as offering grants to support additional export outreach, as well as risk underwriting for potential losses incurred in expansion.

- Incentivise additional investment in the export market channel to increase competition among the exporters to help them improve their sourcing strategies and offer improved deals for local producers. Potential investors to be incentivised to enter the market with a stipulation that they commit to sourcing from smaller farmers.
- Support private sector players to work closely with the Palestinian Authority to strengthen export market awareness of Palestine as an origin, with the development of a “Palestine Fresh” brand.

Small farmers and their organisations

- Incentivise faster change among the more advanced and entrepreneurial small farmers (“lead” farmers) -- for example in the adoption of improved varieties, use of compost as local fertiliser, and adoption of spraying practises for pest management. This would help them achieve greater success and to support them to use that success to demonstrate the potential value of improvements to the smaller, poorer and less entrepreneurial farmers.
- Facilitate investments in and raise finance for greenhouses, new varieties, other inputs – initially these should be partially subsidised to offset the risk, while ensuring the farmers pay something (not less than what they are paying now); over three years, the farmers should be able to take over full payments of the operating costs/working capital
- Help small farmers tackle their main challenges (including difficult access to water and poor agronomic skills) through a combination of assisting with access to training and extension services and supporting for improved governance and advocacy
- Create a competitive platform to incentivise producers’ organisations to upgrade their businesses, starting with the existing ones, especially to improve their ability to supply to the relatively new group of packhouses that can service the export market.
- In Gaza, in particular, support outreach by more constrained and yet more skilled farmers and cooperatives to advocate for improved export market access

Enabling Environment

- Develop and promote a new vision and strategy for a modern, more integrated domestic vegetable sector as a multi-stakeholder initiative, and encourage the adoption of improved produce standards for the domestic food markets, improved infrastructure and physical marketing arrangements
- Facilitate development of systems and links that support commercial connections between farmers’ desires to improve practises and potential providers/suppliers of needed goods and services.
- Support establishment of trade agreements specific to fresh vegetables and herbs, and enforcement of existing ones between oPt and Arab countries and the EU.
- Support the Palestinian Authority with legal and technical assistance to negotiate with the Israelis to ease access to imported inputs (especially fertilisers), navigation through checkpoints; increase transparency and predictability of crossings to Israeli markets and export markets through Israel and through Jordan.

Impact

These recommendations have the potential to increase the value of marketed production in the vegetables sector according to our modelled approach by a cumulative \$30.4 million over the next 5 years. To illustrate this impact, if achieved, these increases could benefit 4,000 vegetable farmers by an average of \$2,600 per family per year in the fifth year. Any impact of the extension to herbs would be over and above these numbers. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

The Dairy Sub-sector

Overview

Milk from cows accounts for 55% of the total milk produced in the oPt. There are two distinct markets in this 95,000 tonnes/annum sub-sector of cattle dairy:

- a traditional market (representing around 60% of the total) of small and medium herders throughout the West Bank and Gaza producing for local consumers of raw fresh milk and traditional processors with extremely small-scale family enterprises; and
- an industrial market (40%) comprising 10 processing plants and almost 100 large farmers which in addition to pasteurizing, transform the milk into dairy products such as cheese, yogurt, and labaneh.

The number of cows has remained relatively constant since 2004. However, there is a clear trend of a reduction in the number of animals in Gaza due to a decrease in the viability and attractiveness of the prevalent extensive model of production, and increasing numbers and size of dairy operations in the West Bank to support the local industrial processing industry.

The West Bank industry has in recent years supported the growth of large-scale dairy enterprises via increased sourcing from domestic raw milk rather than from imported supplies. This has been accompanied by significant expansion in local processing plant capacity. As yet these plants have poor linkages to smaller producers due primarily to: challenges in establishing efficient supply from poorly organised small-scale farmers with no cold chain and inadequate supply chain infrastructure, higher prices in local markets for direct raw milk sales to the local community (albeit that the volume of such demand is below supply), and a lack of established trust.

Opportunities

The primary opportunity is development of the local industry to facilitate import substitution in a growing domestic market:

- Domestic demand is around 189,000 tonnes of milk equivalent products per year, most of it for cheese, yogurt, and fresh milk.
- Demand for fresh and pasteurised milk is flat, but demand for yogurt, cheese, and *labneh* is growing and has been driving an increase of imports (currently at 22,000 tonnes of milk equivalent, valued at \$25 million), mainly from Israel.
- This trend of increasing demand is expected to continue, as oPt is behind Arab countries in terms of consumption per capita of dairy products.
- More research is needed regarding the quality and price competitiveness of specific products in oPt against the equivalent Israeli imports. However, in terms of retail prices, oPt seems to be able to compete on cheese and yogurt production versus these imports.

Additional opportunities may also lie in exports to Israel:

- Dairy products from oPt sold to East Jerusalem, have increased from \$6-\$7 million in 2007, to the current level of \$11 million despite Israeli efforts to reduce its level of dairy imports overall.
- Thus, it appears further improvements in dairy competitiveness by oPt producers and processors will be able to drive further increases in exports to the Israeli market.

Bottlenecks to achieving these opportunities are displayed in the following figure:

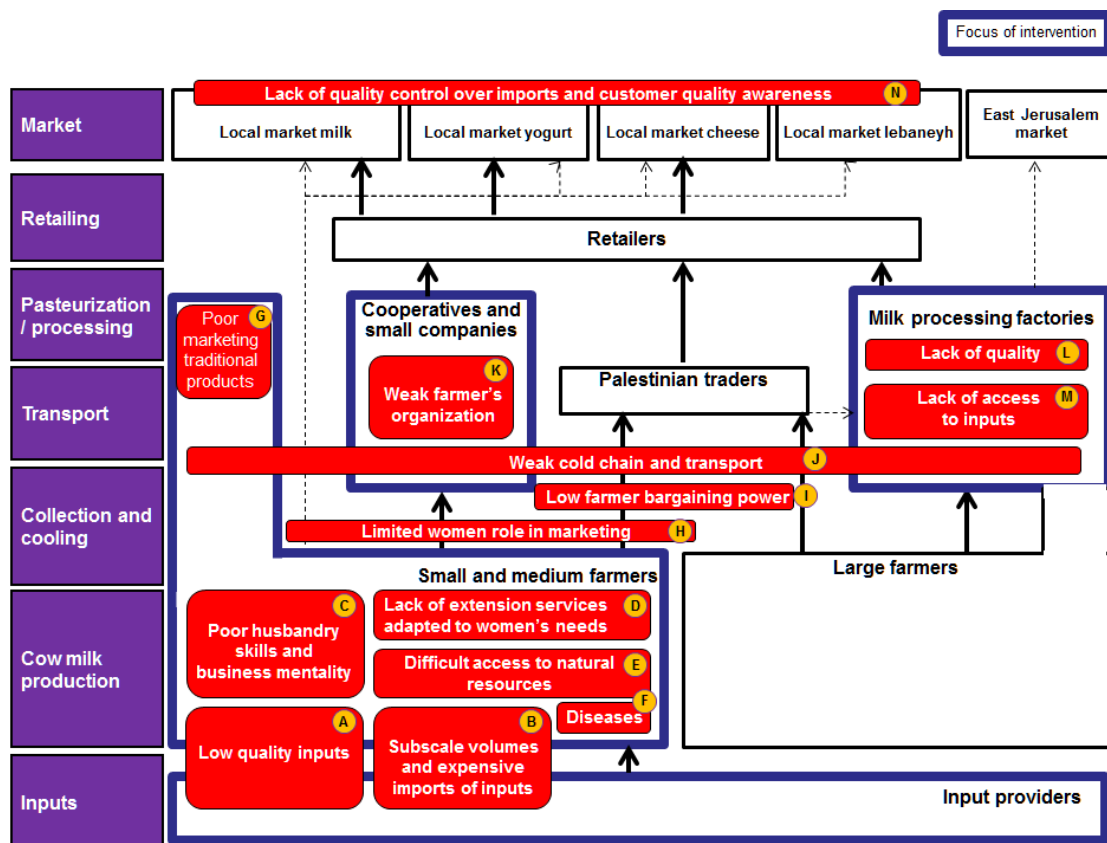


Figure 1.3

Recommendations

The study's integrated recommendations are mainly aimed at catalyzing market changes so that larger processors are incentivised to link to smaller milk producers and support them in improving their productivity.

Recommendations include:

Channels to market

- Incentivise processors to explore alternative ways of sourcing from small producers based on improved supply chain efficiencies, quality enhancement and risk reduction to take advantage of lower cost supply and import substitution opportunities.
- Incentivise processors (e.g. through a challenge fund) to invest in expanding their value adding activities to produce more yoghurts and cheese for the local markets (import substitution).
- Explore the feasibility with local processors for them to collaborate in developing an actual or virtual 'brand' for formal sector dairy products.
- Improved industry regulation and self-regulation is needed to improve quality controls (Public authorities will have to at least oversee this.) An improved system of industry data collection – on production, import/export, sales, prices, etc. – would help build and maintain competitiveness

Small farmers and their organisations

- Work with local processors and stakeholders to support the organisation of farmers into producer groups of around 30 farmers each; and in turn support and build incentives for these groups to aggregate into milk collection centres that bring together 8-12 producer groups into an umbrella business unit comprising around 350 farmers – able to supply 6,000 – 9,000 litres of milk daily. Once a business case is proven for such groups, the farmers

would be naturally incentivised to support the formation of these larger marketing units to achieve economies of scale and efficiencies in accessing inputs, finance, animal health and other needed services. The processors in turn would be able to manage their procurement more easily from these larger, better managed and more efficient units.

- Enable collection centres to assess the feasibility of and, if justified, to install a bulking and chilling plant. Having farmers own the plant would provide the farmers with greater bargaining power and flexibility, but alternative business and ownership models would need to be explored to assist the farmers in their decision-making..
- Limit dependency on imported heifers, and improve dairy herd genetics, by incentivizing the development of cattle breeding stations and/or artificial insemination providers to lessen the burden on the over-stretched and under-capacitated public sector
- Seek to reduce dependency on imported feeds by improving linkages between local crop producers and livestock feed mixers and supporting market-driven improved farmer knowledge of efficient and effective feeding practises. Developed as a business “hub”, a rural bulking and chilling centre can support its suppliers/members/owners by coordinating and improving their access and linkages to a range of services, credit, feed/fodder, training and animal health.
- Strengthen incentives for processors and farmers to increase the respective transparency of their businesses, to build trust and strengthen market linkages

Enabling Environment

- Enable animal health and other service providers to offer both public sector and commercial support to processors and producers’ organisations, given the concentrated nature of demand for their services. The service providers themselves may have capacity building needs at the outset of their journey, which could be addressed through the programme.

Impact

Our projections, based on certain assumptions about the potential scale of any new interventions, indicate that the above recommendations have the potential to increase the value of marketed production in the sector by a cumulative \$8.8 million over the next 5 years. To illustrate this impact, if achieved, these increases have the potential to benefit 750 small-scale dairy farmers by an average of \$2,900 per family per annum in the fifth year. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

Sheep and Goats Sub-sector

Overview

High self-sufficiency and low volumes of exports characterise the Sheep and Goats sub-sector, with annual production estimated at around 26,000 tonnes. In the last decade, Palestinians have shifted consumption from fresh sheep and goat meat to frozen beef and chicken meat; this appears to be due to relative price increases of the former and not because of shifts in taste. The price shift was itself mostly caused by declining access to suitable land for local animal holding and to increases in fodder price. In response, the Palestinian herd size fell significantly, reportedly from over 1,011,000 animals in 2008 to a current stock of 793,000.

These factors have accelerated the shift in production models, with an increasing majority of sheep and goats now being raised via the semi-intensive model of production, versus the extensive model. The majority of these animals are slaughtered and sold in small independent butcher shops, in both rural and urban areas.

Opportunities

With local tastes preferring sheep and goat meat over poultry and beef, the main opportunity is to reverse the relative price trends and restore market demand to previous levels. With nothing else changing, study analysis shows that a sheep farmer's profit can increase some 45%, to 247 NIS per animal, if he sells at the right weight (after 6-7 months) and improves the mortality rate from 10% to 7%. In addition there are opportunities to improve the efficiency of the value chain connections from farm to consumer and ensure better-aligned economics and incentives through the use of more appropriate pricing strategies. And there are opportunities for women to play a more extensive role in breeding and in value-added dairy products.

Bottlenecks to achieving these opportunities are displayed in the following figure:

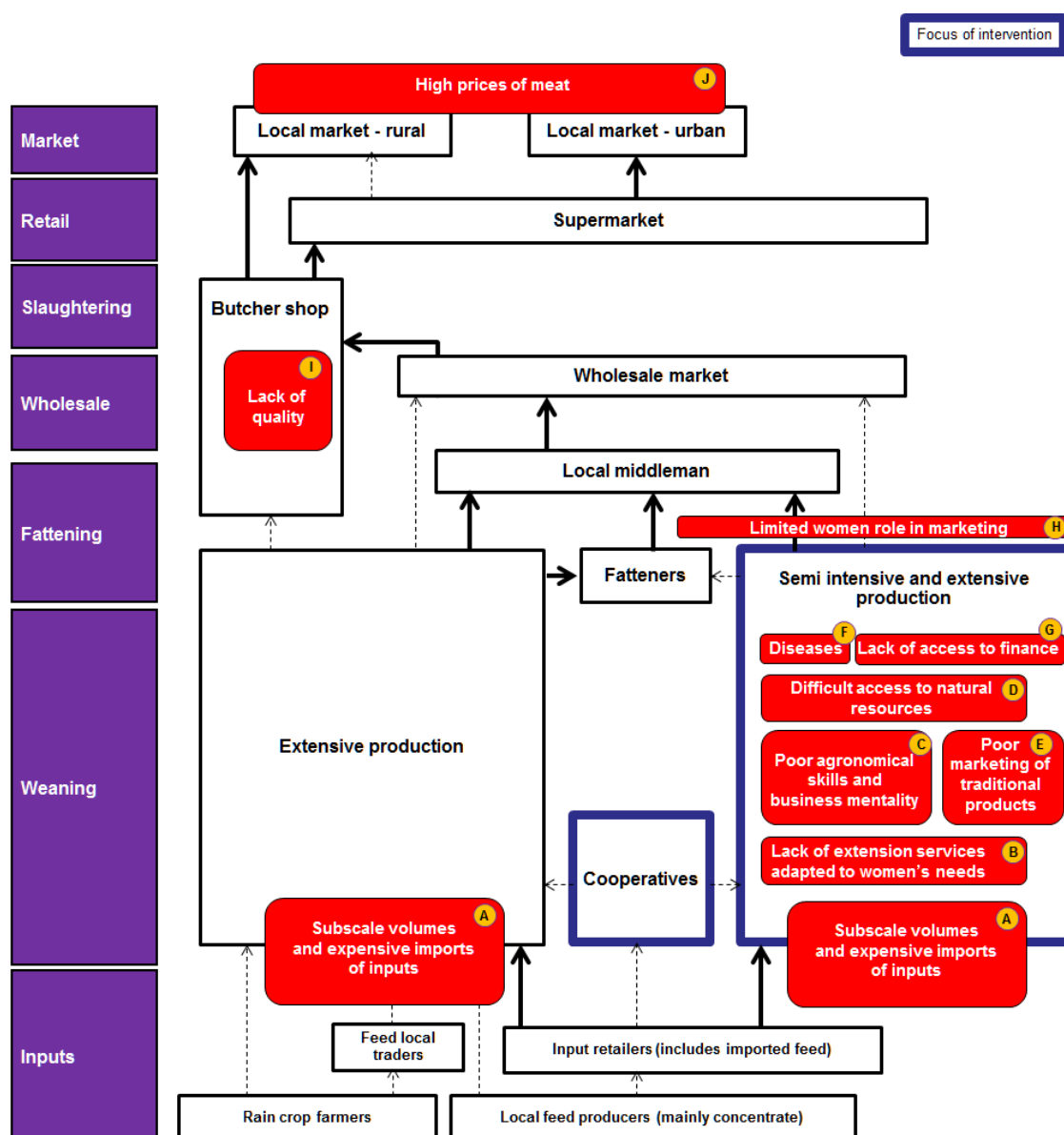


Figure 1.4

Recommendations

Recommendations to regenerate growth in this sector, are mainly aimed at catalyzing market changes that will help producers' identify how to reduce their production costs and improve their competitiveness. They include:

Channels to Market

- Incentivise improvements in feeds and feeding practises through import substitution – with particular focus on linking local barley farmers to feed businesses and the more organised farmer groups. The intent is to incentivise barley farmers to increase their productivity (which is relatively low at 256 kg/du.), and to increase the area under fodder crops by integrating fodder production in crop rotations
- Support improvements to slaughtering businesses by the industry; development of MBOs will support improvements and efficiencies by aggregating and organizing demand for information and services. Explore the feasibility of having the lead butcherries develop a positive 'brand' identity for their major sheep and goat meat products to expand sales of fresh sheep and goat meat.
- Work with butchers, abattoirs, fattening operations and other stakeholders to develop systems and incentives for producers to better orient their production to the market. This is likely to include aspects of seasonal demand and differentiated demand, e.g. for holidays and to suit consumer interest for meat (differentially priced) from both younger and older animals. These same stakeholders can be supported to put in place the improved access to financing needed for additional working capital requirements. To support these efforts, development of appropriate member business organisations (MBOs) for post-production enterprises should be explored.
- Support improvements in women's presence and role, especially on processing sheep and goat dairy products. A focused business plan competition might identify high-potential women entrepreneurs – individuals or groups – and support them in up-grading product production, packaging and marketing

Small farmers and their organisations

- Test and develop market-based systems to expose farmers to and train them in best practises within the semi-intensive model to improve productivity (such as managing water quality and accessing improved feed/fodder). This can drive sheep and goat meat prices down by an estimated 6-9 NIS per Kg.
- Build market-driven incentive systems that will help small farmers understand the advantage of, and proceed to form, primary producer groups of 10-30 farmers to facilitate training, improved gender dynamics and improved access to needed information, inputs and services. Such farmer organisations will help aggregate demand for veterinary supplies and services to improve herd health and reduce mortality.
- Women's groups can be incentivised to establish breeding farms to fill the gap for high-quality ewes/rams and does/bucks. It has been suggested that this activity would be more acceptable than women's groups engaging in animal fattening operations.
- Farmer groups can also support getting higher market prices/margins for animal sales by coordinating collection and dissemination of market price information offered by the broad range of relatively small buyers – to introduce effective competition.

Enabling Environment

- Aggregated demand is expected to incentivise a supply response from private suppliers. Depending on the responsiveness of private sector service providers, like an association of butchers, a higher level association of producer organisations may be needed; this could

clarify and communicate sub-sectoral needs to suppliers, or even provide some services itself if private suppliers do not respond.

- Support strengthening private service providers and the Ministry of Agriculture to work with markets and producers to improve control of the health of imported livestock, a frequent source of disease.

Support to the remaining extensive herders, particularly for Bedouin populations who may be reluctant to shift to the semi-intensive model in the short-term, could include:

- Building consensus and common advocacy for access to land.
- The design and development of rangeland CBNRM systems (community-based natural resource management).
- Development of local mediation services and systems to resolve herder – farmer conflicts.

Impact

Our assumption-based projections indicate that adopting the above recommendations would have the potential to increase the value of marketed production in the sector by a cumulative \$13.9 million over the next 5 years. To illustrate this impact, if achieved, these increases have the potential to benefit 4,000 small-scale sheep and goat farmers by an average of \$750 per family per annum in the fifth year. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

Olives Sub-sector

This study's mandate was to summarise the extensive work done to date in the olive sub-sector, to identify lessons learned, and to give recommendations for future focus.

Work to date

The olive sub-sector has long been identified as a promising agricultural sub-sector, given the potential to increase domestic per capita consumption of olive oil (currently at 40% of the levels of 25 years ago), the potentially attractive international markets and the opportunity to explore the production and export of other olive products, like tapenade and cured/pickled olives. Production could increase at least 30% without increasing the area planted or existing processing capacity. The improvement of this sector would have a positive social impact, as around 70,000 households are partly or mainly dependent on olive oil production.

Researchers have identified the opportunity, and developed a strong set of industry data. The sub-sector has received a lot of attention in the last years from a range of development projects. Yet, there has been no upward trend in olive production; per capita consumption of olive oil has remained stagnant; and olive oil exports are growing only slowly and are still low in volume.

Lessons

This experience provided the study with an opportunity to learn some lessons from prior efforts and fold them into the recommendations made here. In particular, it seems that there has been insufficient attention to addressing:

- Low productivity.
- Inconsistent, and often low, fruit quality, especially of small farmer production.
- Lack of trust and transparent communications between the larger processors and exporters and the smaller farmers.
- There is also concern regarding the negative impact of wastewater mismanagement.

These problems are mainly due to poor agronomic practises, lack of producers' commercial acuity, inefficient use of irrigation, lack of proper disease management systems, poor logistics and untimeliness of pressing, use of old inefficient presses, and incorrect utilisation of presses.

Future focus

In the olive sub-sector there is still work to be done to address these challenges. Many of which are echoed in the recommendations for the other sub-sectors, above. They include:

- Improve transparency and engagement between businesses with channels to end-markets and farmer organisations.
- Improve farmer organisation.
- Improve orchard management.
- Introduce supplementary irrigation.
- Improve pest and disease management.

Roadmap

Successful implementation of these recommendations will require coordinated effort from opportunity-directed consortia over the next 3-5 years. The main themes of activities, summarised in the figure below, are to:

1. Organise and upgrade the output of the supply base
2. Increase the activity, competitiveness, and constructive conduct of the processing and marketing channels
3. Strengthen the enabling environment, particularly water and advocacy

These activities will best be organised by consortia assembled in response to each sub-sector opportunity. The specific design of each of these consortia blueprints, and particular parties' participation, should properly be led by the overall implementing agency for any overall programme. The overall activities in each thematic area, however, should consist of a carefully sequenced set of actions within the road map that will result in the transformation of the market systems in the core value chains and a fully sustainable market eco-system after the proposed five years. A suggested version is mapped in the following two figures.

Cross Cutting Recommendations

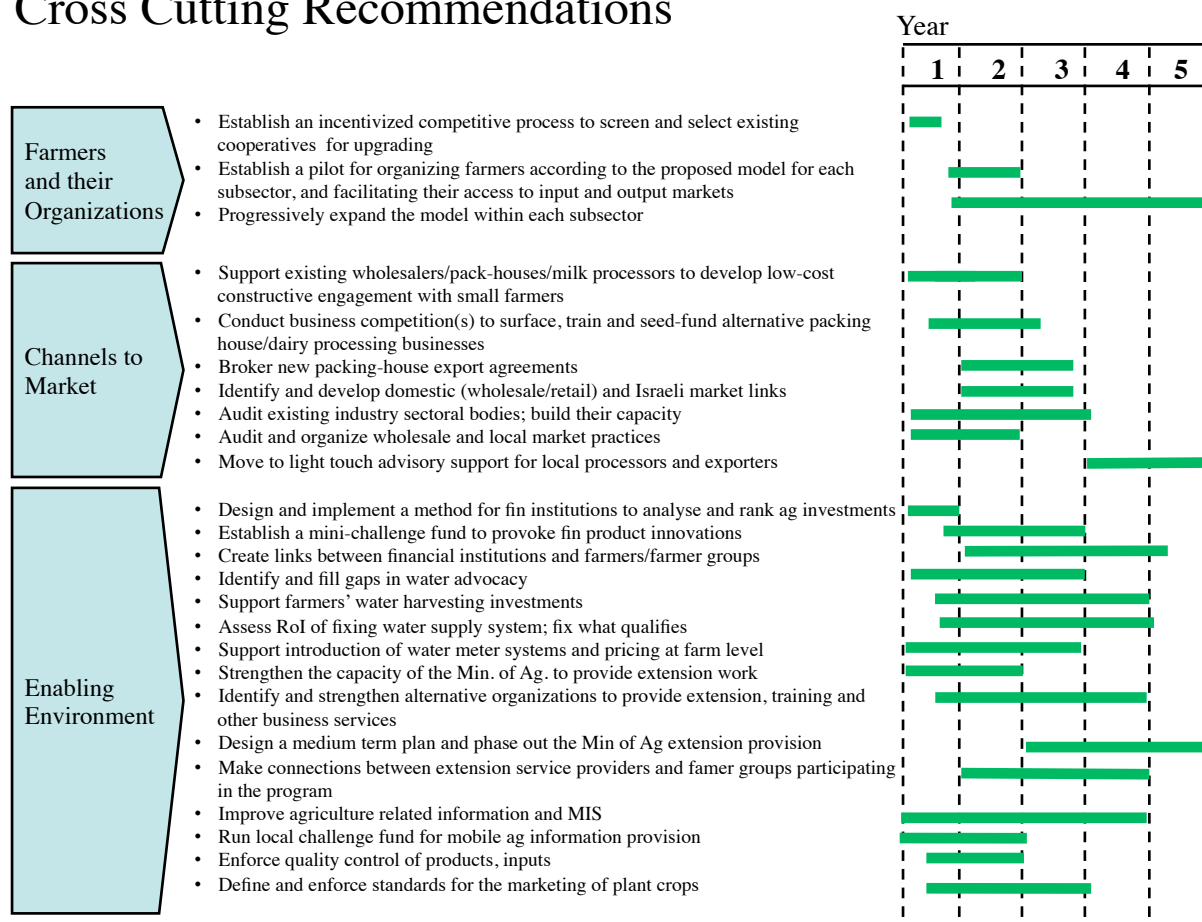


Figure 1.5

Additional Sub-sector Recommendations

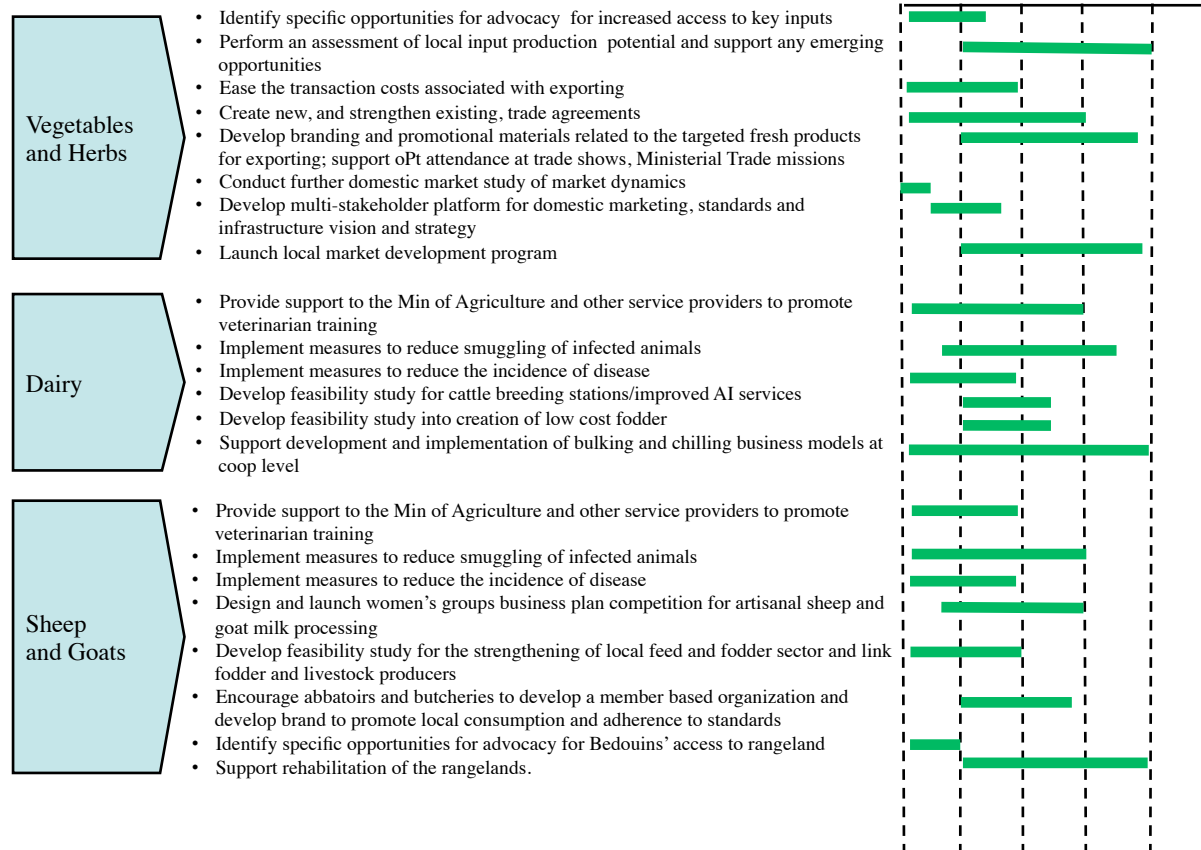


Figure 1.6

2. Introduction

2.1 Context

This report presents the findings of an 11 week study, conducted in June-September 2011, into the agribusiness sector in the Occupied Palestinian Territories (oPt). It was funded by the Facility for New Market Development (FNMD) as part of the UK Department for International Development's (DFID) overall strategic framework for support to the private sector in development. It follows and builds upon the Palestinian Ministry of Agriculture's own recent strategic review of the sector, entitled, "Shared Vision".

The study's purpose was to use value-chain and further "Making Markets Work for the Poor" (M4P) analyses to identify market system failures that are preventing the oPt agricultural sector from achieving its full potential and benefiting small Palestinian farmers and women, and to develop recommendations for how to address these. The study focused on 3-5 high potential sub-sectors across both the West Bank and Gaza – vegetables, dairy, Sheep & Goats; and herbs and the olive sectors more lightly – to do this.

TechnoServe conducted the study, in partnership with Horizon for Sustainable Development, Oxfam GB, Moon Valley, Portland Trust, and Oxford Policy Management. Besides leveraging existing studies, the team met with a range of key stakeholders, including the oPt Ministry of Agriculture; local and international investors; local farmers; cooperatives; farmer and women organisations; traders; processors; exporters; key donors; and local NGOs. The work proceeded in four stages:

1. Selection of the agriculture sectors to analyse in the study (2 weeks)
2. Overview of the agriculture sector and the olive value chain (2 weeks)
3. Analysis of the four selected value chains (5 weeks)
4. Validation of the main conclusions of the study, and writing the draft final report (2 weeks)

Two notes about data

- Sub-sector selection: The limited time available and scarcity of preexisting robust data meant the team relied heavily on local expertise and judgment, rather than on a comprehensive analytical study (which could take up to 2-3 months to complete), to inform sub-sector selection.
- General data availability: The team was challenged by general scarcity of preexisting data and frequent contradictions in the data that does exist. Ongoing efforts to strengthen the Ministry of Agriculture's statistics function and the contents of some previous studies' research into specific interventions provided some basis, but the team was hard-pressed in the time available to generate the quality and volume of data that normally underpins a complete and robust report. As a result:
 - Throughout the document and whenever possible, official data from the Palestinian Central Bureau of Statistics (PCBS) are used. Where no specific citation is provided as to data source, PCBS is the source. In cases where there are challenging contradictory views about the validity of the PCBS data, the observation is reported and an effort made to explore the differences.

- Some of the first recommendations of this report are centred on the critical need to improve data generation, analysis and dissemination

2.2 Overview of the Document

- The Executive Summary has been presented in Section 1
- Chapter 3 presents a brief overview of the oPt agricultural sector.
- Chapter 4 gives an account of the sub-sector selection.
- Chapters 5-8 discuss each of the selected sub-sectors in turn, presenting for each: an Executive Summary; Overview of the Sub-sector; Discussion of Market Failures and Bottlenecks; Sub-sector Opportunities; Recommendations and Estimated Impact.
- Chapter 9 reviews the cross-cutting recommendations.
- Chapter 10 presents an aggregated Roadmap
- Chapter 11 provides a final note on next steps.

3. Brief Overview of Agriculture in oPt

This Chapter gives a brief overview of Agriculture in oPt. It does this in 4 sections (headlines summarised here):

- 3.1 Importance of Agriculture in oPt: Variability in reported share of land use; Modest contribution to GDP but key source of employment, especially for women; Very important industry given widespread food insecurity.
- 3.2 Summary of oPt Agricultural Output: Olive production dominates the West Bank and West Bank dominates Gaza for share of land in trees, field crops and vegetables, but Gaza contributes nearly 30% of agricultural GDP from high-value focus; Poultry dominates Sheep & Goats dominates Cattle in terms of livestock value, Gaza focused mostly on Poultry.
- 3.3 Sector-wide Characteristics, Challenges and Opportunities: Heavy reliance on imported, often restricted inputs; Water scarce, access challenges, variable quality; Production fragmented, mixed crop production, highly variable productivity, a diverse cooperative system, long-set systems of beliefs and practises; Processing dominated by few players operating sub-capacity; Markets fragmented retail underdeveloped wholesale, export dominated by processors; Enabling environment underdeveloped on the whole; Road infrastructure is in good condition; Main opportunities in import substitution, diversified export market targets, local market development.
- 3.4 Recent Development Activity: Large donor fund base, relative to size and population; Discrete projects by several different funders not holistic or coordinated; some conflicting expectations and incentives across value chains. Some aid/hand-out mindset entrenchment needs to be overcome.

3.1 Importance of Agriculture in oPt

Land Use

PCBS¹ estimates that agricultural land represents 42% of the total oPt land area of 6,069,000 (6069k) dunams, with 72% currently under cultivation (1)². Figure 3.1 depicts the official reported distribution of this land between West Bank and Gaza, Israeli and Palestinian National Authority (PNA) control. There is significant divergence between this data and other sources – e.g., Applied Research Institute of Jerusalem (ARIJ) estimates agricultural area at 1073k dunams. A full report on the 2010 census is due in early 2012.

¹ Palestinian Central Bureau of Statistics. 1 dunum = 0.1 hectare.

² Report's citation system referencing sources reported in bibliography. Where a specific page is cited, the notation used is (1, p. 54).

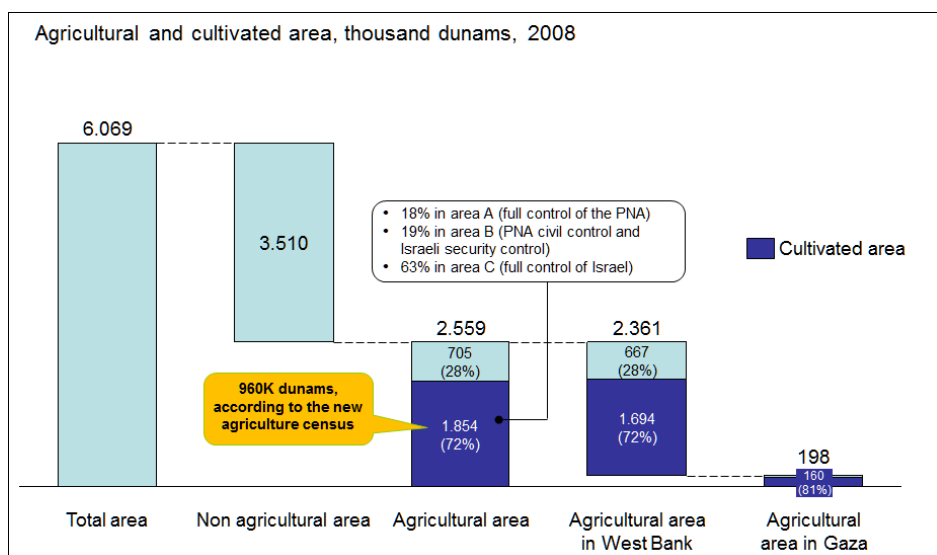


Figure 3.1 –

Economy and Employment

Agriculture makes a modest contribution to oPt GDP, but is a substantial source of employment, particularly for women.

Figure 3.2 illustrates that the 6% (\$360 million) contribution to GDP made by agriculture in 2010 was dominated by plant crops (4). This contribution is in the lower end of the range for countries in the region: Egyptian agriculture contributes 14% to GDP; Syrian, 21%; Israeli and Jordanian, both 3% (5).

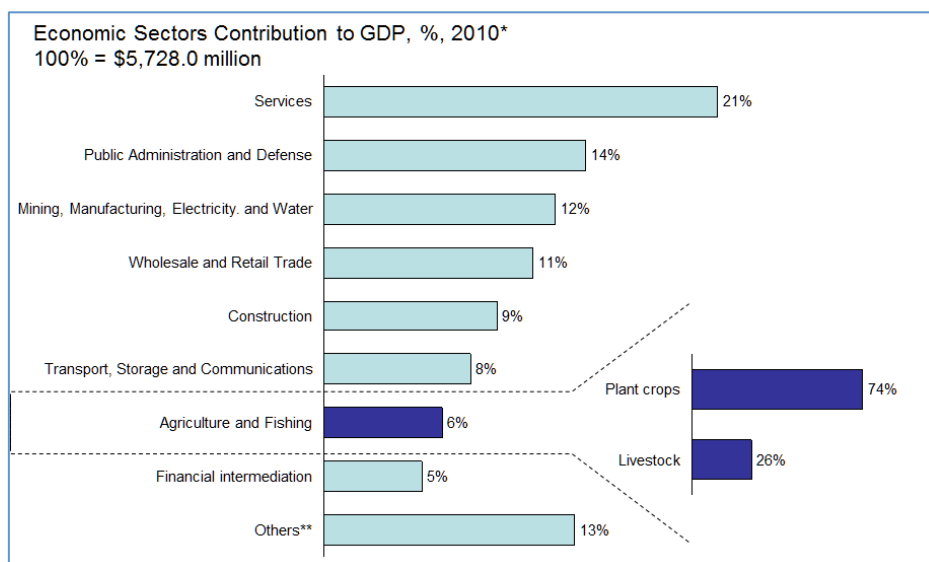


Figure 3.2 –

Figure 3.3 indicates the sector's contribution to employment, including nearly 30% of women's employment in 2008 (6), comprised mostly of unpaid family member work (7).

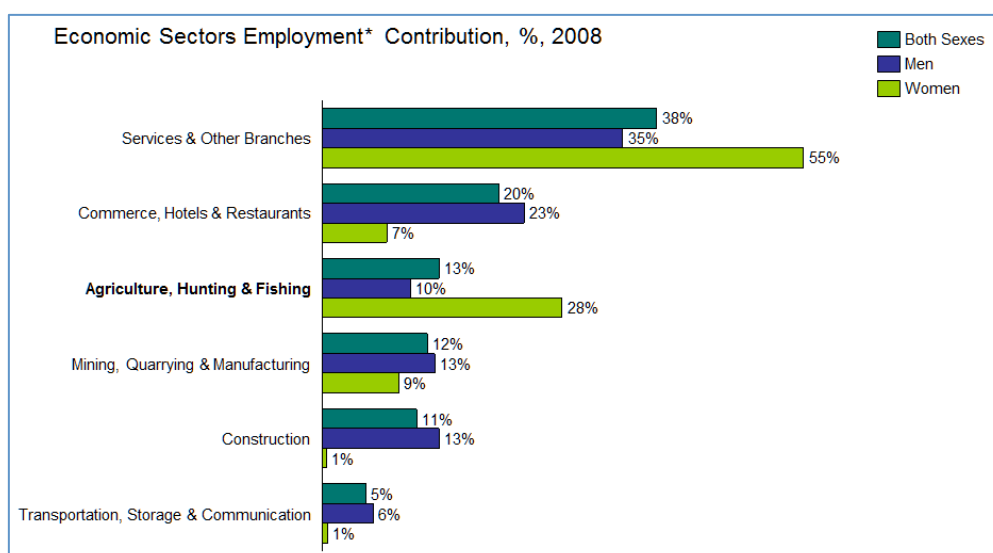


Figure 3.3 –

Food Security

A reported 42% of oPt's 3.8 million people were food insecure³ in 2009, with the majority found in rural West Bank and Gaza as depicted in Figure 3.4 (1).

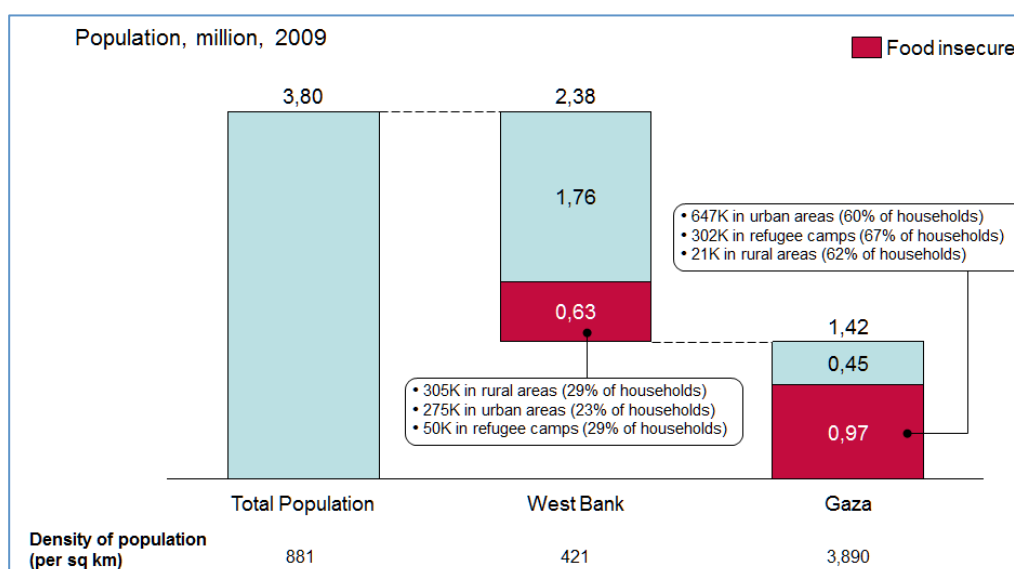


Figure 3.4 –

The most food insecure population groups in oPt are:

- Farmers whose access to land and agricultural inputs is restricted by the Wall, other barriers and mobility restrictions in the West Bank, and by the Buffer Zone and blockade

³ Meaning they are subject to one or more of: Lack of access to food (due to low income, low subsistence productivity, high food prices, high other prices); Lack of food availability (due to the above, and limited stability of market supplies, poor post-harvest practises); Poor food utilisation (due to poor information, cultural practises, disease, lack of food safety practises)

in the Gaza Strip, and whose harvests are affected by drought, frost and other adverse climatic events;

- Herders in the West Bank whose access to water and grazing land is limited by the land restrictions, settlements and drought;
- Fishermen in the Gaza Strip whose access to fishing waters is restricted;
- Urban poor whose irregular and low wages are insufficient to meet their food and other basic needs in a context of increased prices: Almost one-third of West Bank and two-thirds of Gaza resident households live on less than \$609/month per household. One in 10 people in the West Bank, and 1 in 4 in Gaza, live in households with less than \$478/month.

It is clear that improvements in to oPt agriculture will have critical and far-reaching effects beyond increased contribution to GDP.

3.2 oPt Agricultural Output

Note: The PCBS data presented here does not include data from the Israeli settlements.

Trees, Field Crops and Vegetables

Figures 3.5 – 3.8, below, depict the share of cultivated area, volume, and value represented by olives, field crops, fruit trees (and others) and vegetables; in the West Bank and Gaza⁴:

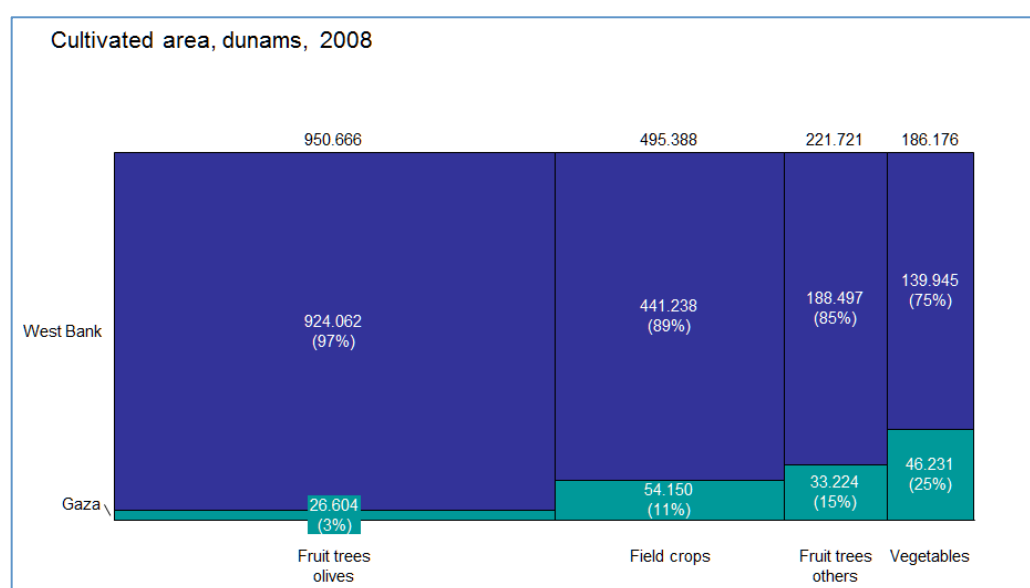


Figure 3.5 –

⁴ The same cautions with respect to data apply as in section 3.1

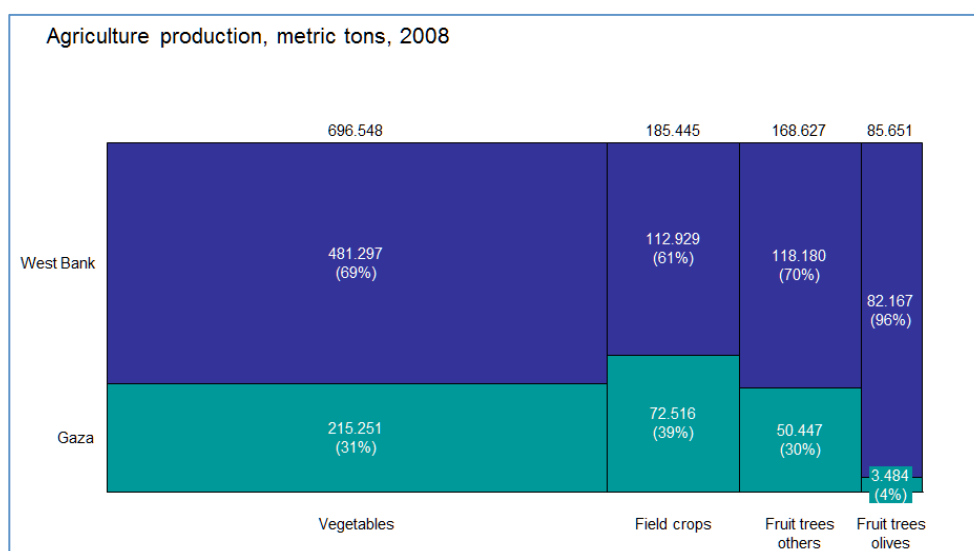


Figure 3.6 –

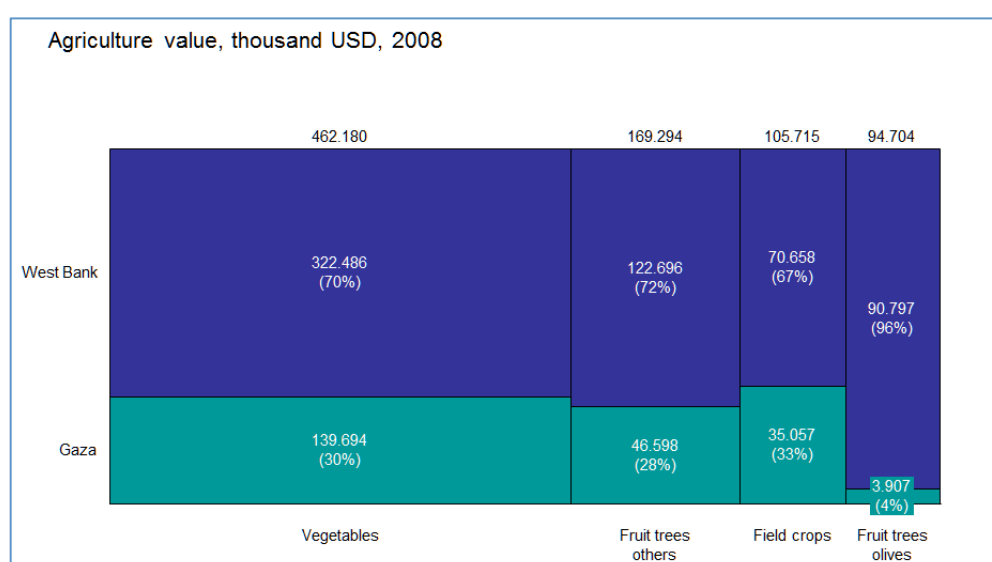


Figure 3.7 –

These figures indicate:

- West Bank cultivated area is more than 90% of the oPt cultivated area; but Gaza contributes nearly a third of agricultural GDP via its substantial contribution to high value vegetables and field crop cultivation (25% and 11% of these sub-sector' cultivated areas, respectively);
- The majority of cultivated area in the West Bank is used for olives; Gaza focuses on field crops, vegetables and other fruit trees;
- Total volume in 2008 was 1.1 million tonnes (dominated by vegetables at 700 thousand tonnes); total value was \$832 million.

Figures 3.8 – 3.10 disaggregate vegetables, field crops, and trees into their constituents (by volume and value, 2008). They are dominated by: tomato, cucumber and eggplant; potato, dry onion and wheat; and olive, grapes and oranges; respectively:

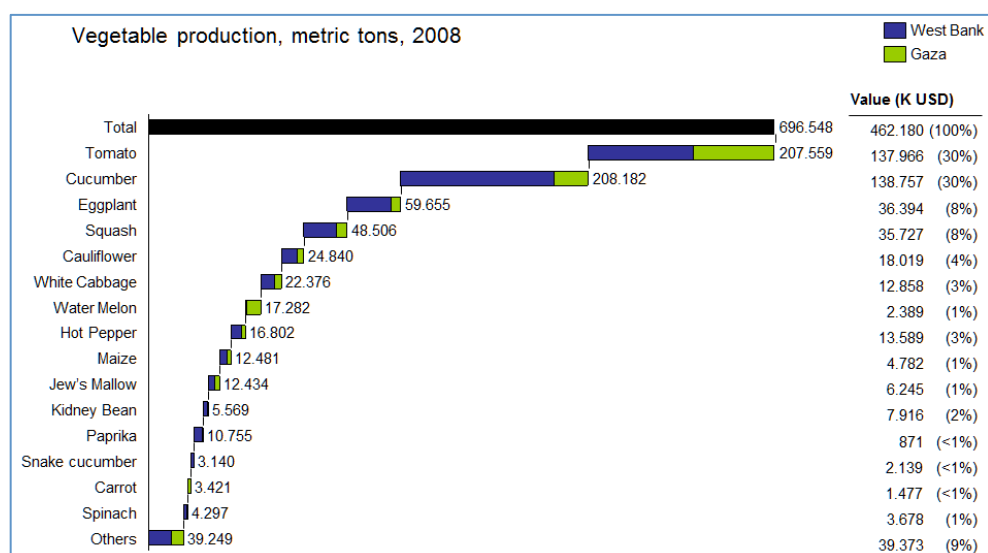


Figure 3.8 –

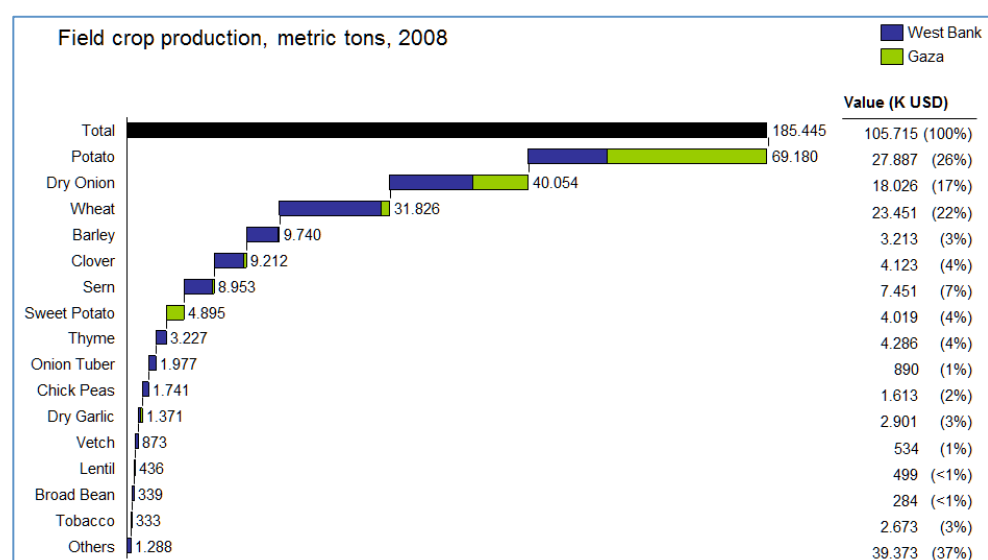
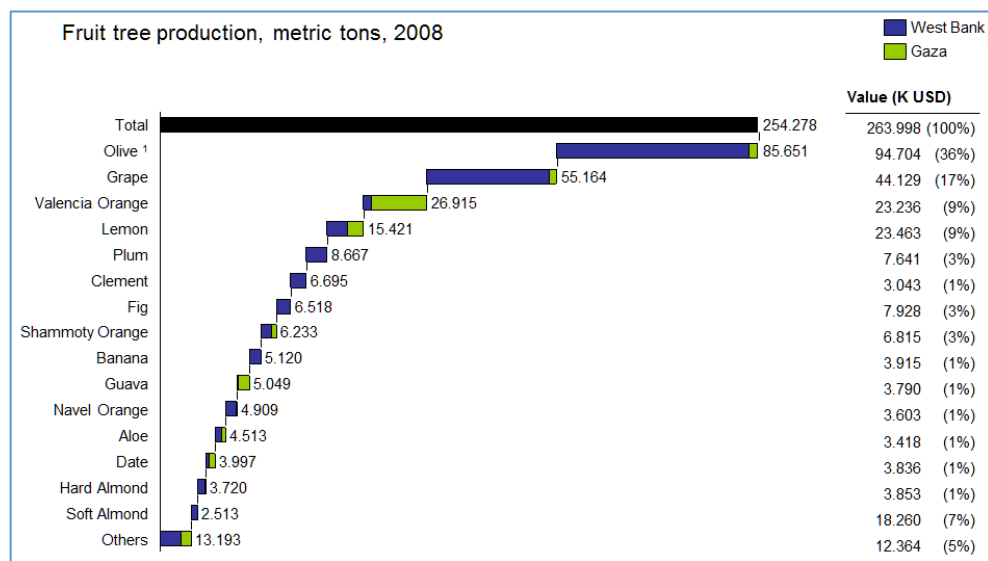


Figure 3.9 –



1: Average quantity of olive pressed in the period 2003-2010 was 70,143 tons (PCBS). Assuming that 95% of olive production goes to olive oil pressing ("The road to olive farming", Oxfam, 2010), the average production of olive oil between 2003-2010 was 73.835 tons

Figure 3.10 –

Livestock

Livestock produce (meat and milk) in oPt was valued at around \$445 million in 2008. Figure 3.11 presents a breakdown across the 3 main categories: Cattle (including dairy), Sheep & Goats, and Poultry. It shows that West Bank production dominates the Gaza strip in all sub-sectors in terms of volume, though less so in broiler poultry, which is also the highest per-unit value sub-sector within livestock.

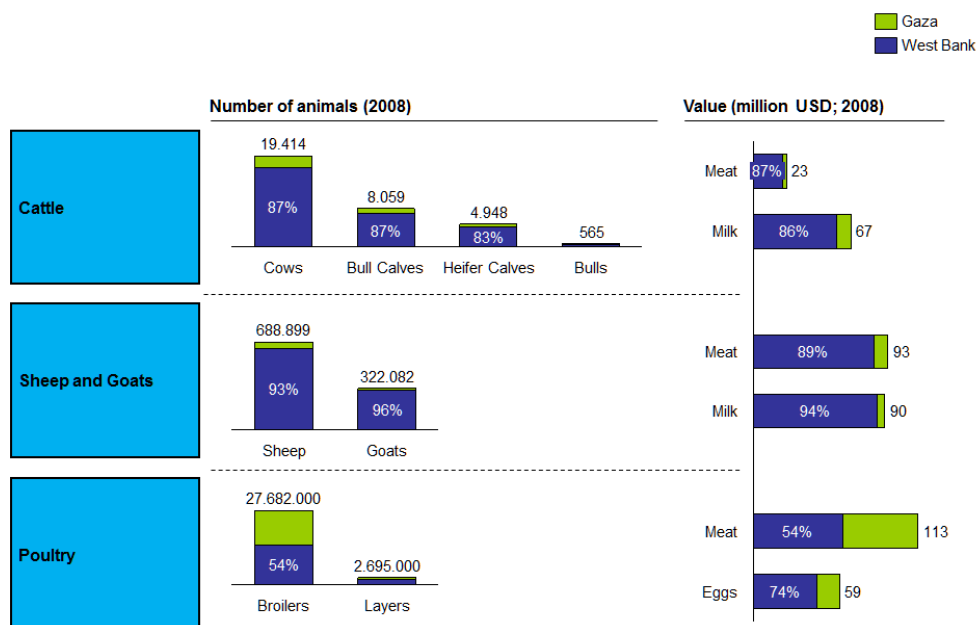


Figure 3.11 –

3.3 Sector-wide characteristics, challenges and opportunities

A comprehensive system description for each particular sub-sector occurs in later chapters. This section briefly introduces some sector-wide characteristics and challenges by stage of the value

chain, and a description of the types of opportunities we nonetheless see for oPt agriculture (and elaborate on in the sub-sector chapters, also).

Inputs

OPt agriculture relies heavily on imported inputs, which can be subject to stringent constraints:

- Fertilisers, herbicides and pesticides
 - Such inputs for the West Bank are usually imported from Israel through a local middleman; a significant share of supply for Gaza is smuggled through the tunnels to Egypt.
 - Fertiliser prices can vary between 2.2 and 6 NIS/kg depending on quality (local, organic fertiliser costs around 0.2NIS/kg).
 - Several fertilisers are banned due to Israeli concerns about “dual use”. A reported 5-15% productivity loss in plant crops can be attributed to this (4).
- Seeds, seedlings
 - There is no domestic seed production due to inadequate or inappropriate technology, weather, varieties, genetic stock so most seeds are imported from Israel or Europe via an Israeli middleman.
 - There are 30-50 vegetable seedling nurseries in oPt. 95% of vegetable farmers buy their seedlings from local nurseries.
 - Herb farmers tend to buy higher quality seedlings from Israel when their crop is intended for export.
- Livestock feed
 - Feed accounts for 55-65% of the cost of raising a sheep or goat, and up to 40% of the cost of fresh cow milk.
 - More than 95% of the wheat-feed, and 85% of the protein-feed are imported from Israel for sheep and goat feed. Most concentrate and roughage are imported from Israel for dairy feed, too.
 - While no shortages were reported, prices have been rising: Concentrate for dairy feed has more than doubled since 2000 to 1.8 NIS/kg, forcing smaller farmers to increase grazing time or use lower quality feed.
- Livestock medicines
 - Medicines are also mainly imported from Israel, with no reported shortages in the market.
- Water is a critical input for both crops and livestock, and is characterised by scarcity, difficulty of access, and poor and variable quality.
 - Increasing urbanisation and recent droughts have increasingly limited availability for agricultural use.
 - Palestinian West Bank rights to supply from the 3 West Bank aquifers allocated in the Oslo accord are ¼ those of Israel and the settlements.
 - Water harvesting and well digging is prohibited in Area C (an estimated 63% of cultivated area).
 - Existing water distribution infrastructure is reportedly inefficient, leaky, and metred by time rather than volume.
 - High levels of salinity reduce the applicability of water once received; Sinokrot in Jericho attribute low sweet pepper yields (7-8 tonnes/*dunam* compared with Israeli neighbors’ 10-11 tonnes/*dunam*) to oPt water salinity.

Production

The production stage of oPt agriculture is characterised by fragmented, mixed crop production, highly variable productivity, a diverse cooperative system, and by particular and long-set systems of beliefs and practises:

- Fragmented production, as depicted below in Figure 3.12, is driven by size of landholding and by rational risk-spreading by individual farmers. It results in low bargaining power with input suppliers and produce buyers; prohibitive unit costs of extension and training; and insufficient scale and planning to participate in markets beyond the local and informal sectors.

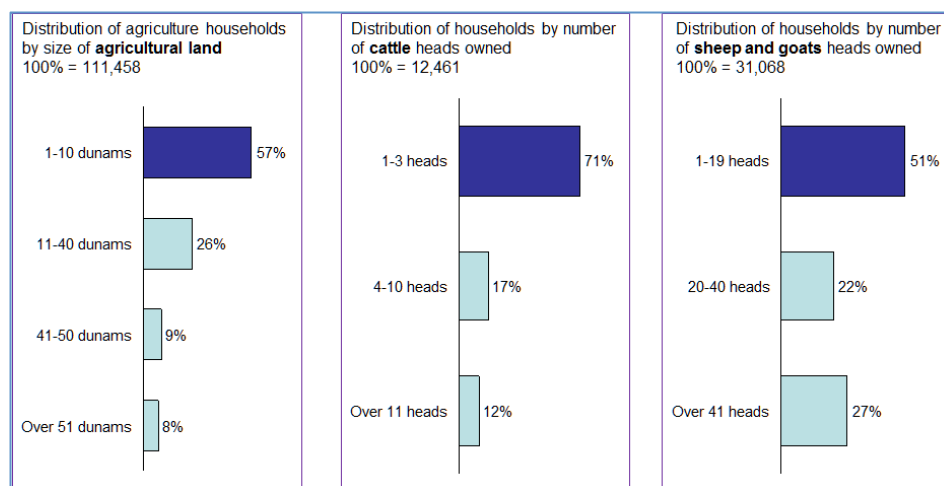


Figure 3.12 –

- Productivity is highly variable, depending on the agro-climatic zone and farmers' skill and scale of production. For example, in the Dairy sub-sector, milk production/cow averages 20 litres per day for a small farmer (26 for larger producers), but with variation from 10-25 litres per day, on any given day.
- The cooperative system in oPt is characterised by 224 active cooperatives, most of which are located in the West Bank.
 - 113 of the estimated 120 oPt vegetable cooperatives are in the West Bank
 - Gaza cooperatives are bigger (100-1000 members per group) and provide more services (such as marketing) than their West Bank counterparts
 - West Bank cooperatives (only 16 of the 113 have greater than 100 members) mostly limit their services to input purchasing.
- Beliefs and practises that characterise oPt agriculture include:
 - Reluctance to borrow from banks due to religious concerns about interest
 - Limited autonomy and unequal access to assets for women (despite constituting a substantial part of the agricultural labour market)
 - Neighborly, informal assistance during harvest times, and neighborly gift-giving, rather than sale, of surplus produce.
 - Scepticism in some areas about formal registration of cooperatives and farms as businesses due to long-held beliefs that agriculture is properly not a business but a traditional means to subsistence.
 - Growing enthusiasm for turning to cooperatives as a means to reduce economic and agronomical risk, but view that few best practise examples yet exist.

Processing and Packaging

The vegetable and herbs for export processing and packing segment is dominated, at sub-capacity, by the Sinokrot Global Group. Milk processing occurs at 10 industrial plants. Neither of these models yet accommodates small scale suppliers well. Sheep & Goats are slaughtered at the local butcher level.

- The Sinokrot Group, which possesses most of oPt's export relationships has capacity to package 15000 tonnes of vegetables and herbs but currently operates at an average 33% of capacity. Efforts to include more small scale producers have been hampered by costs to conduct training, quality assurance, and traceability across such a fragmented supply base.
- The current industrial milk processing capacity operates at approximately 45% capacity, with similar challenges in economically aggregating small-scale (cool) supply.
- Most sheep and goat meat, destined for domestic consumption, is slaughtered by small-scale, local butchers.

The Marketplace

Most oPt agricultural produce is bound for the domestic market, which is characterised by fragmented retail and under-developed wholesale sectors.

- The retail market is comprised of shops and market stalls – there are no large-scale supermarkets.
- There are 9 wholesale markets in oPt, mostly in cities. Municipalities rent impermanent stalls to agents on 1-2 market-days per week. Produce is sold by auction. Middlemen link farmers to these markets.
- Crop produce destined for the export market is typically controlled by the major packing houses (like Sinokrot, above). Low volumes of livestock are exported, mostly to Israel.

Enabling Environment

Extension and financial services are both currently wholly inadequate in oPt. Road infrastructure, agricultural institutions, and policy and regulation are in better order.

- Extension services reportedly (9, p42) suffer from lack of human and financial extension resources at the village level; poor operational support; lack of applied training and incentives for extension workers; lack of farmer input into extension service design, training, or support.
- Access to finance is very limited for small farmers. On the supply side there is little availability of financing from local development or financial institutions due to poor product development and perceptions about the risk of agricultural lending. On the demand side, lack of scale, cultural beliefs about borrowing, and opaque sales prospects for their produce limit serviceable demand and therefore the amount farmers have to invest in, e.g., improved inputs, greenhouses, on-farm post-harvest hardware, or cold chain assets.
- Road infrastructure is generally good. Some rehabilitation would help feeder roads.
- There is a reasonable representation of public, industry, and NGO institutions guiding and governing the sector, including: the PNA; Ministry of Agriculture (MoA) and its

16 Agricultural directorates (with approximate 2008 budget of NIS 72 million); the Palestinian Olive Oil and Olive, Milk, and Grape Councils; and 35 Palestinian and 15 foreign NGO and civil society organisations.

- Policy and Regulation is supported at the general level by the PNA, and in the particular drafting, strategy formulation, regulation and implementation, by the MoA.

Farmer Cooperatives

A weak enabling environment for cooperatives has long been the general rule for countries in the Middle East; relevant policy and legislation has not been supportive of cooperative development. Cooperative development in Palestine suffered due to the existence of 2 sometimes contradictory bodies of germane law, one for the West Bank and one for Gaza. Nevertheless, the drive for Palestinian farmers to affiliate to access economies of scale has been reasonably strong. From 2001 to 2005 the number of registered agricultural cooperatives and societies reportedly more than doubled.

In April 2010, 221 agricultural cooperatives were reported (out of 497 cooperative associations), with a total membership of some 18,000. Two-thirds of these associations, and four-fifths of the total members, were focused on plant production; the rest were engaged with livestock. In November, 2010 the Ministry of Labour reported a total of 900 cooperatives in oPt distributed across the housing, crop, livestock, consumption, services and handicrafts sectors, with agriculture and housing being among the largest.

A focused study of the cooperative sector was undertaken for the first time in October 2008. Building upon that work, in 2009 over 350 cooperative stakeholders met to discuss what had emerged as the three main challenges for cooperative development: 1) Absence of a legislative and regulatory framework to organise the cooperatives sector in Palestine; 2) Limited financing and credit for cooperatives; and 3) Low skills/capacity of cooperatives.

Local observers have summarised the problems facing oPt agricultural cooperatives as falling into 3 basic groups, problems related to market access, finance and management/governance:

1. Problems associated with key markets relating to the production and marketing of agricultural products. Key issues cited in this area include:
 - Israeli measures at checkpoints restricting movement of inputs and products.
 - Movement and usage restrictions on agricultural lands, and water.
 - Lack of adequate information about foreign markets.
 - Unfair practises of Israeli producers and traders.
 - The lack of appropriate refrigerated storage for vegetables.
2. Problems associated with cooperatives' access to capital, including:
 - Limited ability and willingness of members to invest equity.
 - The inability to meet banks' requirements for finance.
 - Mismanagement of development projects.
 - Fluctuation of currency exchange rates.
3. Problems associated with cooperatives' access to capital, including:
 - The absence of standard democratic processes; most agricultural cooperatives are weak and lack clear bylaws, adequate management systems, or guiding visions or goals. In many cases, they are controlled by single families or powerful individuals.

- Poor marketing and commercial planning and management skills; generally limited capacity of cooperative management and workers
- The poor understanding and penetration of cooperative principles; weak commitment of members to their cooperatives.
- Poor practises of donor-funded projects, leading cooperatives to expect substantial subsidised assistance, and undercutting self-reliance.

The connections among cooperatives themselves are also weak, generally limited to existing personal relationships between presidents. Additionally, the social interests and agendas of cooperatives often come at the expense of their commercial objectives (which may not be clear).

The team's findings during this study largely agree with these observations. Our analysis made informal use of a flexible analytic framework for capacity assessment of farmer organisations developed and promoted by the Small Enterprise Education and Promotion (SEEP) Network. It recognises five interrelated aspects of a farmer organisation: governance; services; operations; financial viability; external relations.

Our findings were that: 1) cooperatives and other farmer organisations in oPt face distinct problems in all five aspects; and 2) these problems, some of them severe, combine to create a formidable challenge to successful cooperative development. As a result, in spite of all the earlier research undertaken and technical assistance funding provided, small farmers largely remain reluctant and/or unable to associate for commercial purposes and thus fail to engage meaningfully in the market system.

We see as key among these manifold issues:

- A lack of knowledge, experience, and role models showing how cooperatives can successfully function as commercial enterprises; this undercuts needed motivation and confidence.
- The history of social and political dislocation, corruption and abuse of power breeds a culture of distrust of leaders and mistrust of peers and potential commercial partners.
- A corresponding lack of business partners willing to take appropriate commercial risk and invest in building relationships with the smallholders and their organisations.

Nevertheless we conclude that improving small farmer association for commercial purposes is not only possible, but essential. What is needed to break through the current logjam is a fairly intensive and integrated effort that: 1) presents to farmers a clear business case, with a compelling upside and effective risk mitigation measures; 2) convenes essential partners, including those for capital and market access; and 3) coordinates and builds acceptable "honest broker" / auditor functions to work with the partners to ensure transparency.

The relative success of Gaza cooperatives point the way forward; it appears to be based on what are coming to be widely accepted cooperative development principles. Their membership is fairly homogeneous. They survived beyond their challenging early formative stages. They tend to be larger and have significant technical and commercial capacity. This capacity was built largely by their commercial partners, in this case Israeli exporters of strawberries and cut flowers.

Our specific findings and recommendation for farmer organisation and cooperative development recognize this path to success. The report proposes specific ways to achieve it and bring it to scale via commercial market forces and improved and coordinated donor and public sector support. These recommendation are found within the report sections on studied sub-sectors; Appendix 6 contains consolidated and summarised general recommendations.

Main Types of Opportunities

Despite these challenges and others that will be discussed in the sub-sector chapters, this report also describes 3 main types of opportunities that will benefit poor farmers (often/and) women in oPt in particular:

- Increased export sales – accessed by diversifying export channels, aggregating farmers for efficiencies of training and supply, and targeting new and more accessible growth markets.
- Increased sales to domestic consumers – through import substitution and market growth potential
- Increased marketplace efficiencies that see more margin captured by producers – by introducing standards, grading and traceability practises.

3.4 Recent Development Activity

Background

Relative to its small geographic size and population, the oPt benefits from considerable funding to all sectors from a broad range of donors. Many of these donors make significant annual contributions directly to the Palestine Authority to help address its public sector budget. Significant and direct funding support for the development of the agricultural sector is mainly shared amongst the official development and aid agencies of: the USA, the EU, FAO/UN, Japan, UK, Netherlands, Switzerland, France, Italy and Canada. These donors have also been prominent supporters of cross-sectoral development in areas highly relevant to this study, notably in:

- Promoting entrepreneurial economic activity in the SME sector as well as support to larger, already established process and export businesses
- Focusing on driving competitiveness and investment in new and Improved technologies
- Accessing new markets
- General trade facilitation

This cross-sectoral support from donors has included specific activities for promoting entrepreneurial activity in young people, women, and business and societal groups. Improved access to water and more efficient use of the very limited water resources has also been a major focus of the donors and clearly an area vital to agricultural development. More details of specific donor support are given in Appendix 1. They are not exhaustive, and focus just on the recent or ongoing activities and programmes directly relevant to agriculture and agribusiness.

Comments on the nature of recent donor funding and its consequences

Fragmentation: In recent years, much of the donor funding for the agricultural sector has been somewhat short-term in its nature and reactive to emergency conditions created by the volatile nature of the Palestinian-Israeli conflict. As such, many donors have been discretely supporting a wide range of pilot studies seeking to optimise developmental support, but too small-scale to carry much impact across the whole sector. Support to the sector has thus been somewhat fragmented and incomplete. Where donors have attempted a larger-scale programme of development it has been cross-sectoral rather than just focused on agriculture and has, because of the need to get agricultural trade and agribusiness activity launched at short notice, tended to focus on support to a small group of stakeholders further down the value chain, rather than taking a longer-term and more holistic approach that would drive more momentum across the whole value chain.

Packhouse Example: For example, the provision of modern horticultural packing houses were essential to the launching of fresh vegetable and herb exports from Palestine to the EU and other

markets, but these facilities are now owned and managed by just one entrepreneur who is struggling to achieve economic capacity utilisation. The answer to the capacity utilisation dilemma is to encourage the full participation of small farmers in the value chain but thus far export volumes are only being drawn from medium to large growers, and small growers still need considerable technical support and strengthening of their institutions before they can begin to meet export produce requirements.

Olive Example: Similarly in the olive sector, there has been substantial investment in modern stainless steel olive presses and considerable technical know-how installed with the processors and exporters in product processing and marketing, and investment also in modern olive production agronomic practises, but most small-scale olive producers are struggling to raise productivity and quality. While there is nothing wrong with the technical nature of the extension packages now available for small farmers, the nature of that extension has failed to provide small farmers with a clear business case that would convince them of the economic value of investing in improved husbandry. The end result is that olive productivity has remained stalled. If small farmers are to participate in the drive for profitability in the agriculture sector then development projects and programmes will need to be driven more holistically such that all stakeholders across the value chain in a win-win-win situation.

Aid Mindset: While the urgent need to deliver support to the Palestinian economy may have warranted wide-spread use of grant funding for agricultural development projects, and to kick-start commercial agribusiness activities, the unfortunate outcome has been smallholder expectations that development projects are all about grants and hand-outs rather than committed investments. This plays out from an extension standpoint, for example, in that it is very difficult to convince farmers to commit to making small but relatively significant investments in improving their productivity, if farmers in adjacent areas are receiving inputs and other forms of support for free. As discussed in the cross-cutting recommendations chapter, below, more support for developing the financial enabling environment is required to help shift the reliance on grants towards more commercially viable and competitive business building.

4.Sub-sector Selection

This Chapter gives a brief overview of the how the Vegetables, Dairy, Sheep & Goats, Herbs, and Olives sub-sectors came to be prioritised for this study. A brief synopsis is given here – more details can be found in Appendix 2.

The time available for sub-sector selection was limited to 2 weeks so was progressed by consulting a wide group of local agricultural development stakeholders for input into a 3 stage screening process. A full list of sources consulted can be found in the Appendix. The screening process filtered 24 initial candidate sub-sectors from the Livestock and Fish, Field Crops, Fruits and Vegetables and Other categories (where appropriate differentiating between the West Bank and Gaza), by:

- First, screening according to commercial contribution criteria (potential for sustainable competitive advantage (30% weighting); potential size of opportunity (25%); space for new investments (15%); environmental sustainability (30%))
- Second, by social contribution criteria (potential for impact on small farmers (35%); opportunity for women empowerment (35%); food security (30%))
- Finally by final discussion and deliberation to arrive at 4 priority sub-sectors of Vegetables, Dairy, Sheep & Goats, and Herbs:
 - Fresh Vegetables (cherry tomatoes, cucumber, hot and sweet pepper, eggplant, and squash), based on opportunity to target the export market.
 - Dairy, based on opportunity to target an import substitution strategy, and to address a potentially expanding local market, by integrating the small farmers into the channel that produces dairy products.
 - Sheep & Goats, based on opportunity to address a potentially expanding local sheep and goat meat market.
 - Herbs, based on opportunity to target the export market.

This process and its results are depicted in Figure 4.1:

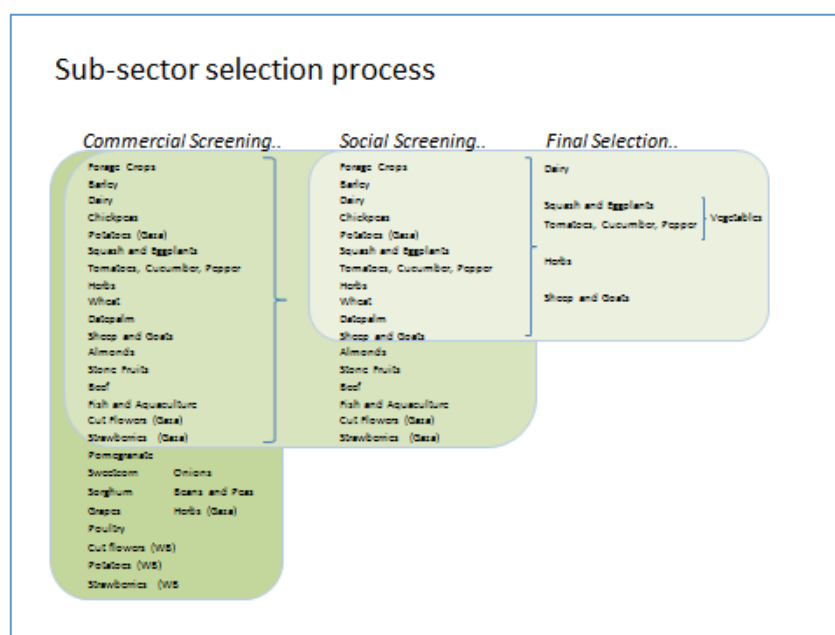


Figure 4.1 –

Given the significant amount of prior investigation and reporting into the important Olive sector, the team was mandated to treat it only briefly - to summarise the current situation and lessons learned from prior interventions, and to propose any further recommendations for development of the sector.

In the Chapters 5-9 following, we present reports on each of the selected sub-sectors.

5. Vegetable Sub-sector

5.1 Vegetable Sub-sector – Overview

Fresh vegetables

Vegetables constitute an important part of the Palestinian diet in both the West Bank and Gaza. Vegetable production accounts for more than half of the volume and value of plant crop production in oPt. The most significant vegetables in terms of production and value are tomatoes, cucumber, eggplant, and squash; together they constitute in excess of 75% of the total vegetable volume and value. However, production is fragmented: it is estimated that small farmers represent 80% of the total number of farmers, but account for less than 50% of total production.

Small farmers mostly have experience supplying the local market, or occasionally the Israeli market. Facing the domestic market's limited quality requirements, product quality is relatively low and inconsistent. The study found that the local market and the Israeli market offer little growth opportunity but that there are opportunities to improve margins for the small farmer and to prepare them for future market developments, such as supermarkets, which will likely arrive in the urban centres of Palestine in the near future. The exception is the few hundred smallholder Gaza farmers who have had a longer tradition of being organised into more effective business cooperatives.

Accordingly, the key opportunity in the domestic market is to improve efficiencies of market access through modernisation of the domestic wholesale and retail sector, with shortened links from increasingly demanding consumers to more capacitated small farmers. This will need a comprehensive multi-stakeholder initiative that will look at improving market regulation, standards, infrastructure, and physical marketing arrangements. A more detailed analysis of the domestic market is required to fully understand the local market dynamics and understand to what extent the supply chains can be shortened given the prevailing political economy among the local traders and wholesalers. As demonstrated by the Gaza models, strong farmer organisations can reap economies of scale in input and output market access, improve farmers' bargaining power in the local supply chains, help them potentially purchase trucks, and achieve operational efficiencies at reduced transaction costs. This can provide a pathway for them to build their capacities and become viable suppliers to the export market.

Given the recent and significant expansion of local wholesale markets, it is imperative to invest in preparing for a more modern sector with growers linked directly to wholesale markets, which will provide a channel to supermarkets in due course. This issue, and some of the associated challenges, will need additional investigation prior to action. But it should be clear that the main gain here will be production cost savings that improve small farmer incomes and viability, possibly reducing local market prices and potentially driving modest volume increases.

There is limited opportunity to expand into the Israeli market, given Israel's own sophisticated production capacities. Export tonnages from oPt are currently around 60,000 tonnes, half of which are cucumbers. The challenges in the short term are defending and preserving current export volumes to Israel, and risk from Israeli dumping into oPt markets, rather than pursuit of growth. Nonetheless, improved competitiveness will position Palestinian suppliers to take advantage of growth opportunities when they arise in the future.

The most attractive opportunity over the longer term is to competitively address the growing demand from markets in export markets such as Europe, Central Asia, and the Gulf. Exports of

Palestinian vegetables have proven that they have good growth potential based on seasonality advantages, even in the most challenging markets of Western Europe, and there are stronger and possibly higher volume opportunities with slightly less demanding product quality standards in Eastern Europe, Russia, Kazakhstan, and the Gulf states. While the export market offers higher prices, it also demands higher quality and food safety standards. This is especially relevant for the West European market and, to a slightly lesser extent, to the market in USA. Examples already exist of Palestinian producers proving to be competitive in these markets, and of these markets having the appetite for fresh vegetables and herbs produced in oPt. As a “step-up” opportunity, given their more relaxed quality requirements, greater success might be achieved in the shorter term in markets in Central Asia (mainly Russia, Ukraine, and Bulgaria) and the Gulf region (mainly Saudi Arabia and the United Arab Emirates).

A few large investors, with donor assistance, have built enterprises in oPt with the necessary technical infrastructure (packing houses, etc.) to supply such export markets, and exports have grown, though at a slow rate. However, Palestinian exporters have yet to consistently prove their competitive credentials in the export markets and are operating at relatively low capacity utilisation.

Bringing small farmers into the export supply base can be the answer to the exporters’ needs for better capacity utilisation, but more importantly can provide much-needed income and work opportunities for oPt’s small farmers and their communities. However, there are few current trust-based and proven relationships between small farmers and these exporters.

At the producer level, Palestine has the potential to expand its vegetable production through improved productivity and product quality, as well as some expansion in planted areas. Given limited possibilities for increased domestic market sales volumes, export market opportunities, if successfully captured, could provide the basis for a dynamic vegetable industry. However, there are a number of key constraints faced by small producers that will need to be first resolved for a successful and competitive vegetable industry to be properly established.

Sub-scale purchasing and Israeli security restrictions mean that input supply is often of low quality and expensive. Poor agronomic skills and business acuity are preventing farmers from achieving consistent better quality and preventing them from obtaining better returns on their investments. In many circumstances the technical content of extension messages is good but farmers are not confident in investing in the improvements because the extension lacked any meaningful business case that demonstrated the improved economic returns to the recommended increased investment. Good quality water is vital but a limited resource for vegetable production in Palestine, although there are some practical means to improve access to water in many production areas. Access to finance is crucial to farmer’s ability to invest in improving their land and productivity but often unavailable or inaccessible for small farmers. Farmers’ cooperatives have a long tradition in Palestine but they are relatively weak and are not offering enough solutions to small farmers in the way of input supply, product aggregation, product marketing, and other services.

Women traditionally constitute a major part of the labour force in production but they are not enjoying an equitable share of the business: they have neither control nor ownership of land; lack influence or positions of leadership in farmer organisations; and, play limited roles in marketing of products.

On a broader level, weak market regulation is preventing proper introduction of quality and trading standards. Market linkages between farmers and packing houses are constrained by the lack of appropriate market information and a distinct lack of trust within the value chain. At present, there are only two export-rated packing houses in the West Bank, as well as two that are run by cooperatives in Gaza; this lack of alternative marketing channels polarises the problems of insufficient product quality and aggregated volumes, and heightens distrust between farmers and

buyers. Further afflicting the sub-sector is the difficulty in exporting fresh and highly perishable produce through the Israeli checkpoints.

Herbs

Herbs, both dried and fresh, are an important part of the diet of Palestinians; herb production goes back thousands of years. In the last few years, production of fresh herbs for export began and some market linkages forged with wholesalers and supermarket buyers in the high-quality UK and USA markets. The herbs sub-sector in oPt is characterised by a clear distinction between domestic and export market, both in terms of channels (the export market is being supplied by dedicated medium and large farmers) and in products (the varieties demanded by the export market are in most cases different from the ones produced for the local market). While exports have helped fuel sectoral growth over the past decade, there have been very few cases of small farmers (mostly through cooperatives) supplying the export market. Efforts to expand the supply chains to include more small farmers have often failed due to gaps in quality expectations, lack of trust through the value chain, and weak production planning and delivery to buyers.

While the export market offers higher prices for fresh herbs, it also demands higher quality and food safety standards. This is especially relevant for the West European market and, to a slightly lesser extent, to the market in USA. However, there are examples of Palestinian producer capacity to be competitive in these markets, and also of the appetite of these markets for fresh herbs produced in oPt. More promising markets, given their more relaxed quality requirements, are Central Asia (mainly Russia, Ukraine, and Bulgaria) and the Gulf region (mainly Saudi Arabia and the United Arab Emirates).

There are opportunities to strengthen the export market channel with existing players. Nonetheless, given the delicate and more demanding nature of fresh herb production and post-harvest handling and lack of familiarity among producers with export quality demands, it is likely to take some time to realise significant gains.

The key constraints to the development of the herb sub-sector are identical to those facing the vegetable sub-sector. At the producer level, sub-scale purchasing and Israeli security restrictions mean that input supply is often of low quality and expensive. Poor agronomic skills and business acuity prevent farmers from achieving consistent better quality and obtaining better returns on their investments. Good quality water is a vital but limited agricultural resource in Palestine, although there are some practical means to improve access to water in many production areas. Access to finance is crucial to farmers' ability to invest in improving their land and productivity but often unavailable or inaccessible for small farmers. Farmers' cooperatives have a long tradition in Palestine but they are relatively weak and are not offering enough solutions to small farmers in the way of input supply, product aggregation, product marketing, and other services. Women are actively engaged in labour for production and in export packing activities but they are not enjoying an equitable share of the business: they have neither control nor ownership of land; lack influence or positions of leadership in farmer organisations; and, play a limited role in product marketing.

Recommendations for vegetables and herbs

The study's recommendations address two different areas of focus: resolution of cross-cutting challenges that affect the whole agriculture sector; and, resolution of some challenges highly specific to both the vegetable and herb sub-sectors. The study makes a number of cross-cutting recommendations pertaining to using market incentives to improve access to finance, improve access to water, and improve access to extension services and training, and production, market and

input supply information. In addition the study recommends priority actions in strengthening market regulation and preparing small farmers for stronger linkages to domestic wholesalers and export pack-houses by building farmer organisations that are more responsive to market opportunities and members' needs.

Our recommendations specific to the vegetable sub-sector address three distinct targets: improved export market channels and increased exports through those channels; increased quality and availability of inputs; and, a reduced dependency on imported, and thus expensive, inputs.

The study also makes some specific recommendations focused on addressing women's needs and the opportunity for them to make a much more valuable contribution to Palestinian agriculture, and be properly rewarded. These recommendations are included in the main body of the study report.

The farm level recommendations focus on market-led means to incentivise faster change among the more advanced small farmers, helping them achieve greater success and to support them to use that success to demonstrate the potential value of improvements to the smaller, poorer and less entrepreneurial farmers. The recommendations propose to tackle the main challenges facing the smallholders (including difficult access to water and poor agronomical skills), while at the same time strengthening their organisations and improving their links to the relatively new group of packing houses that can supply the export market.

Given the recommendations for the herb sub-sector are very similar to those for the vegetables sector (especially around the needs to link more effectively to the existing and new exporters), and that improvements are likely to be realised among vegetables more quickly given the smaller farmers have more existing experience with vegetables than herbs, the study did not spend as much time on developing a strategy for the herbs sector. However, it is recommended that fresh herbs be included in any developmental initiatives for vegetables.

The authors fully recognise that not all farmers and farmer organisations are the same in terms of their sophistication and technical and business acumen, and certainly not the same in terms of their developmental needs. We see that there are three distinct cohorts of farmer groups and organisations:

Level I - More sophisticated farmers, possibly already attempting export production for EU and other major markets.

Level II - Relatively well-organised farmers who are not yet growing to export standards but are regular suppliers of better quality produce to domestic and Israeli markets, and who have the capacity to 'up' their game and start supplying more sophisticated external markets.

Level III - Much less sophisticated farmers, many of whom may be landless and working on a share-cropping basis, but for whom much can be done to improve the margins of supply into the domestic market and Israeli market.

We recommend that development efforts targeting these different cohorts be deliberately structured and phased so that their aspirations and needs are more closely matched by the nature of the support given, the incentives of the markets relationships they need to succeed, and that economic targets reflect their true capacity and capability. Nonetheless, we firmly believe that significant improvements in economic performance are possible for all three levels.

In view of the anticipated slower growth in the herb sub-sector we did not make any impact calculations for herbs in this study and focused just on the vegetable sub-sector. Based on our assumptions, study analysis projects that if fully implemented, the recommendations for the vegetable sector have the potential to increase the value of marketed production in the sector by a cumulative \$30.4 million over the next 5 years, and more beyond. Illustrating this impact in terms

of small farmers- if achieved these increases have the potential to benefit 4,000 vegetable farmers by an average of \$2,600 per family per annum in the fifth year.

5.2 Description of the Vegetable and Herb Sub-sectors

Importance of vegetable and herb production in oPt

Vegetables constitute an important part of the Palestinian diet in both West Bank and Gaza. Vegetables are important to small farmers because of their relatively short production period and quick and ready returns to the farmer in exchange for their labour. From an economic perspective, vegetables dominate agricultural volume and value in oPt. Figures 5.1 – 5.3, below, show that while the bulk of cultivated area in oPt is dedicated to olives and a few other orchard crops (mainly in the West Bank), vegetables easily surpass all other crops in terms of both volume and value.

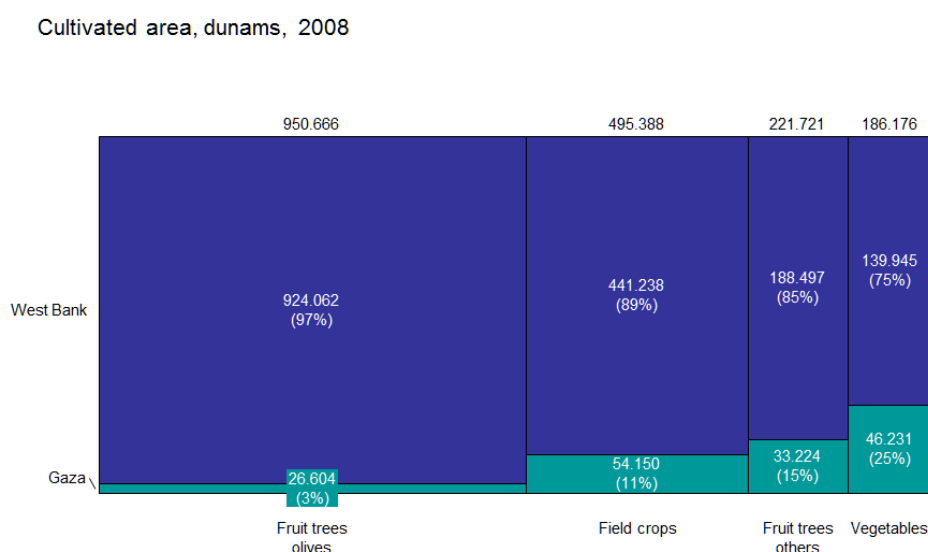


Figure 5.13 – Cultivated area in oPt, 2008

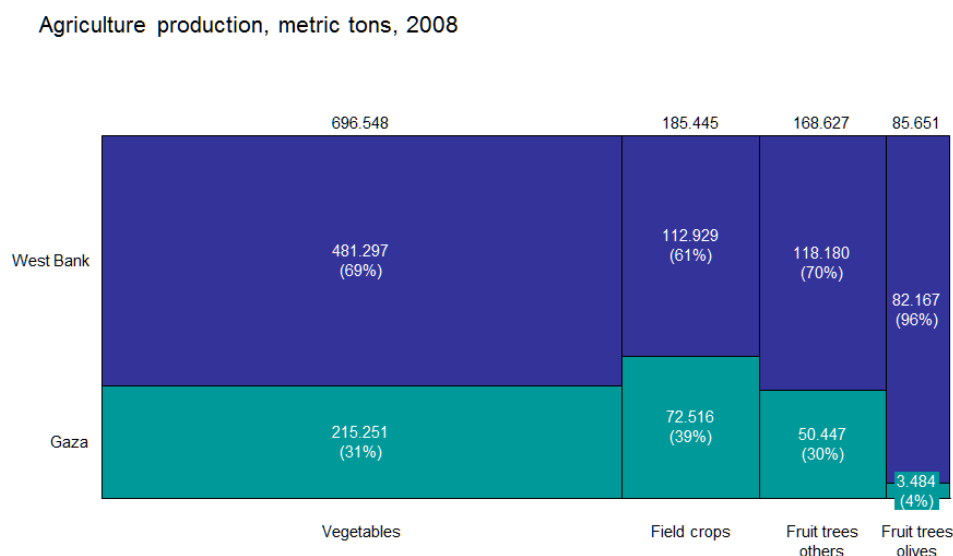


Figure 5.14 – Plant production volume, 2008

Agriculture value, thousand USD, 2008

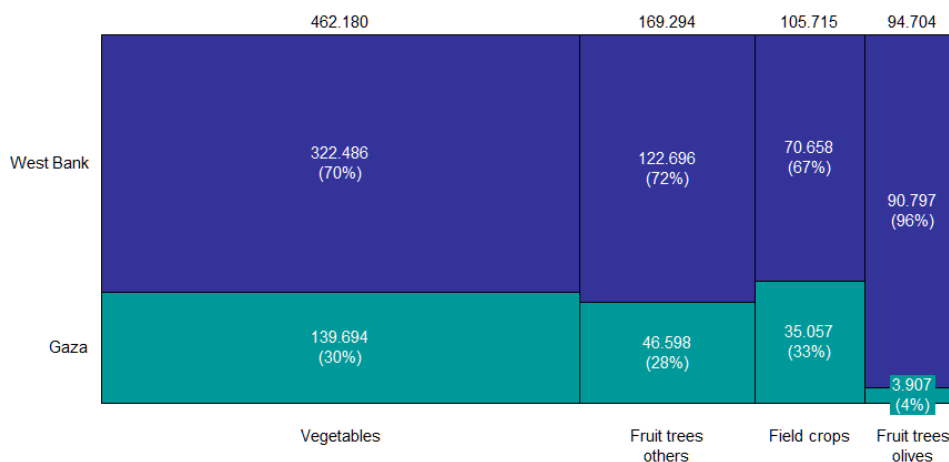


Figure 5.15 – Plant production value, 2008

Tomato, cucumber, eggplant, and squash are the most significant vegetable crops in terms of volume and value, as depicted in Figure 5.4, totaling in excess of 75% of the total vegetable volume and value.

Vegetable production, metric tons, 2008

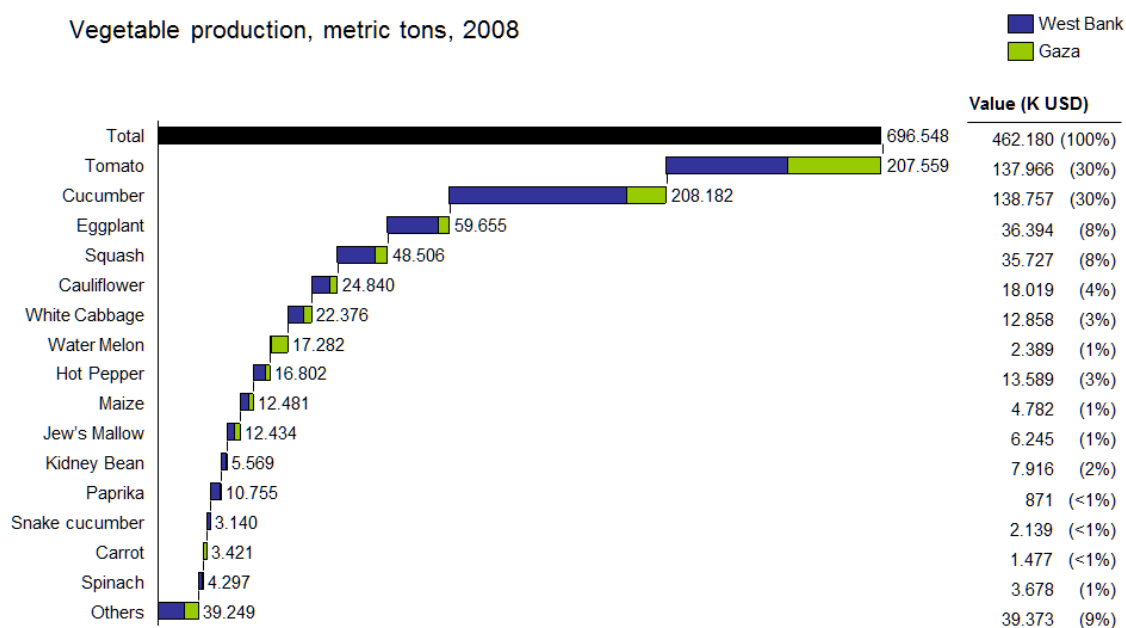


Figure 5.16 – Vegetable production volume and value, 2008

Gaza, given its limited area and high density population, is focused on field crops and vegetables production through well organised cooperatives. This focus on high value crops is reflected in Gaza being responsible for almost a third of oPt's agriculture value (see Figure 5.5), despite having less than 10% of the cultivated area.

Governorate Contribution to Agriculture GDP, %, 2008

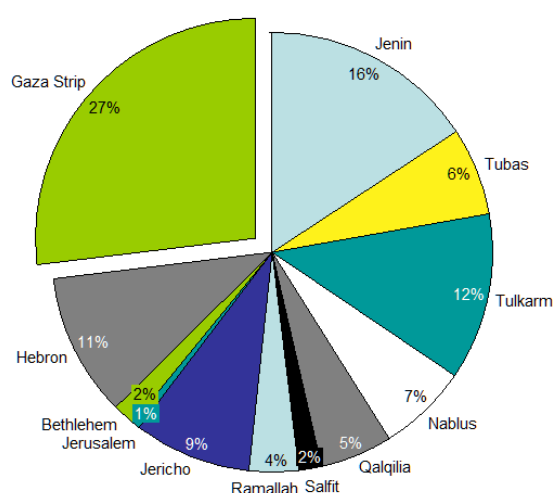


Figure 5.17 – Governorate contribution to agriculture GDP, 2008

Herbs, both dried and fresh, are also an important part of the diet of Palestinians; herb production goes back thousands of years. In the last few years, production of fresh herbs for export began and some market linkages forged with wholesalers and supermarket buyers in the high quality UK and USA markets. However, the volumes grown and total value for herbs is much less than for vegetables.

Current situation for fresh vegetables

Figure 5.6, below, shows the market map for the fresh vegetables sector in oPt.

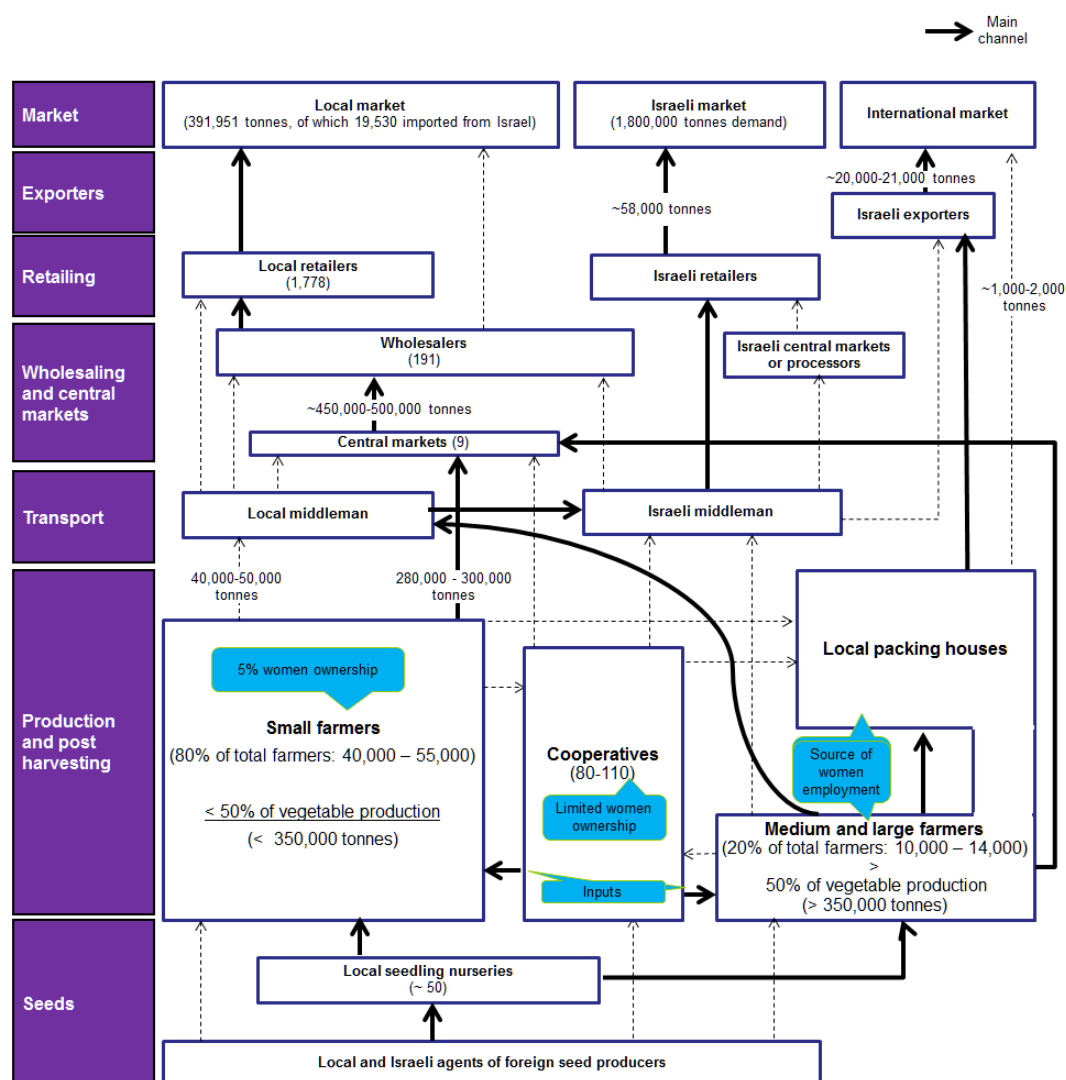


Figure 5.18 – Market map of fresh vegetables in oPt

Domestic market

The domestic demand for vegetables in 2009 was 391,951 tonnes, according to figures of per capita consumption (PCBS, 2010, p. 26)⁵. This is mainly satisfied by local production, which in 2008 was 696,548 tonnes⁶ (PCBS, 2009, p. 77).

Although official figures for trade volume were not available, according to (AOAD, 2009, p. 318), oPt exported around 80,080 tonnes of vegetables in 2008, the majority of it to Israel (57,961 tonnes in 2009, according to (ARIJ, The Palestinian Agro-Production and Marketing System, 2010, p. 59)).

⁵ If calculated as the difference between production and trade balance, domestic demand is then ~695,000 tonnes. Part of the difference is explained by the quantity of fresh vegetables that is processed domestically instead of being consumed fresh (for instance, reportedly about 10 thousand tonnes of tomatoes are processed into tomato paste), and by losses from the farmer to the end market (estimated to be less than 5%).

⁶ According to the Arab Organisation for Agriculture Development (AOAD), vegetable production in 2008 was 342,490 tonnes (3 p. 318). The significant difference of the values between AOAD and PCBS is most probably due to different products being included in the “vegetables” category. The list of products included as “vegetables” in the PCBS calculations are listed in (2 p. 77). There is no information about what AOAD includes in the “vegetables” category. PCBS figures are used, as this source is considered the official one.

Imports come mainly from Israel (Co., 2009, p. 40), and were around 19,530 tonnes in 2009 (ARIJ, The Palestinian Agro-Production and Marketing System, 2010, p. 59).

The Figure 5.7 below summarises this information.

	Domestic demand	Local production ⁷	Imports	Exports
Volume in 2009 (tonnes)	391,951	696,548 (65,000 for processing)	19,530 (from Israel)	80,080 (57,961 to Israel)

Figure 5.19 – Vegetables demand, production, and trade in oPt in 2009

Domestic demand has been growing in the last few years ((PCBS, Levels of Living in the Palestinian Territory 2009, 2010, pp. 26-27), (PCBS, Levels of Living in the Palestinian Territory 2007, 2008, pp. 25-26), (PCBS, Levels of Living in the Palestinian Territory 2006, 2007, pp. 25-26), (PCBS, Levels of Living in the Palestinian Territory 2005, 2006), (PCBS, Quantities of Household Consumption of Food Products in the Palestinian Territory 2004, 2005, pp. 17-19)), but driven only by an increase in population of 2.6% a year (PCBS, Estimated Population in the Palestinian Territory Mid-Year by Governorate, 1997-2016, 2011), as per capita consumption of vegetables has remained constant, both in the West Bank and in Gaza. Figure 5.8 shows this trend.

The figure also shows that per capita consumption of vegetables is higher in Gaza than in the West Bank. One factor that helps to explain this difference is that meat consumption per capita is higher in the West Bank (around 23.6 Kg per year) than in Gaza (around 17 Kg per year); the Gaza population, given lower access to meat products (both because they are poorer than the population in the West Bank, and because there is less meat available in the market due to the Israeli blockade and the low meat production in Gaza), may be compensating for their lower meat consumption with higher vegetable consumption, as well as possibly higher coastal fish consumption.

⁷ 2008 value, as there is no figures regarding production in 2009

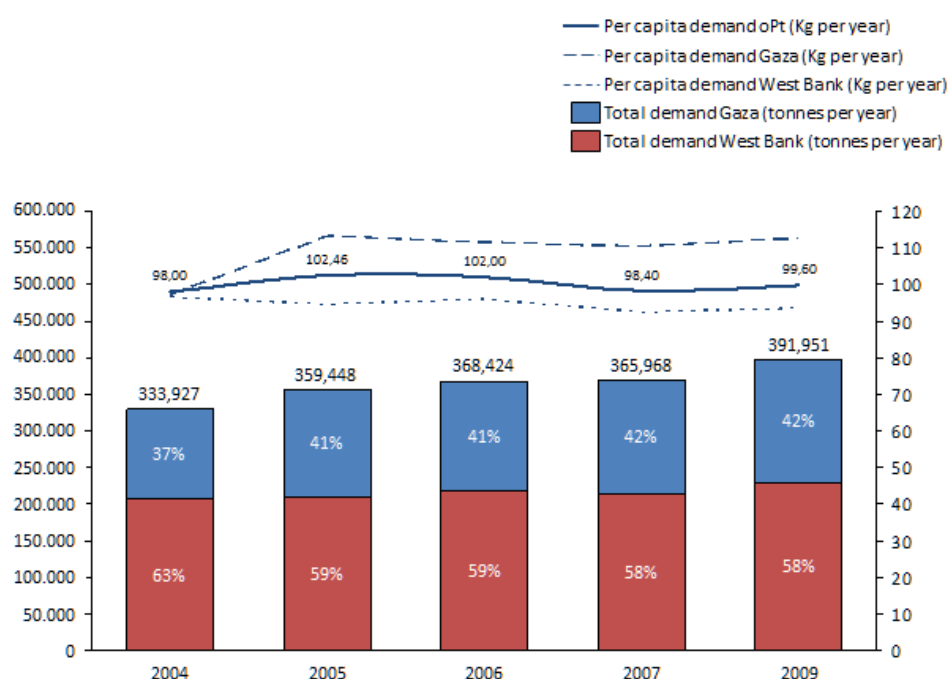


Figure 5.20 – Evolution of the domestic demand for fresh vegetables in oPt

There is an upward tendency in the price of the basket of vegetables Palestinians usually buy: despite stagnant per capita consumption of vegetables, household spending on vegetables has been increasing by 9.5% per year. This increase has been stronger than the increase in total household spending (7.8% a year), which indicates that people are spending a larger share of their household budget on vegetables.

Figure 5.9 shows the evolution of consumer prices (NIS per Kg) for hot pepper, greenhouse tomatoes, cucumber, and eggplant.



Figure 5.21 – Evolution of prices of certain vegetables, 2003-2010

In the West Bank, local prices of the majority of vegetables depend mostly on Israeli local market prices; when the latter increase, there's a tendency for Palestinian producers to shift sales to that market, increasing prices to domestic consumers due to lower availability in the domestic market. Equally, local prices in oPt are reported to drop drastically when there is a glut in the Israeli markets and Israeli traders dump the surplus in Palestinian markets. These swings in pricing are exacerbated by the seasonality of the Palestinian production, where 60-65% of the open-field vegetable production occurs in February to May each year, and a further 20% is produced in the October to December period. Greenhouse production is similarly seasonal, with 45-50% produced in January to April and another 30% in the October to December period. Extreme high temperatures in much of the West Bank, especially in the Jordan Valley, preclude much vegetable production in the months of June to September.

The Palestinian market prices also show a major increase in the Jewish Fallow Year (*Shimta*), which occurs every seven years (the last one was 2007/08; next will be 2014/15), when devout Jewish people in Israel abstain from producing crops for one year and become dependent on imported foods and stores of food from previous years. Figure 5.10, below, shows the impact on market destinations for crops grown in Tubas in normal years compared with Fallow Years (4).

Crop Marketing Period	% Crop Sold in West Bank	% Crop Sold in Israel
Normal Years	70	30
Jewish Fallow Years	33	67

Figure 5.22 – Market destination for Tubas crops in Normal and Fallow Years

The three most important characteristics that consumers value when buying fresh vegetables are affordability, appearance, and freshness. Vegetables are mostly purchased by men (65%), despite an increase in the share of women (currently at 25%) making purchases. Women's increasing role in the purchase of fresh vegetables will place greater importance on product safety and packaging quality, as they are two dimensions especially valued by women buyers (particularly urban and high end market consumers), according to (Madi & Sawafta, 2011).

90% of households purchase vegetables one or more times per week, but only 16% buy on a daily basis. In Gaza, this purchasing is mostly (75% of the time) done at retail shops, whereas in the West Bank the majority of consumers buy from local marketplaces (38% of the time), retailer shops (25%), or roadside stands (25%). This reliance on shops and market stalls for domestic retail distribution rather than on large modern supermarkets contrasts with what can be observed in Israel, where larger supermarket outlets and consumer demand drives higher quality expectations. In Palestine the only example of a modern supermarket, albeit still on a rather modest scale, is the Bravo supermarket in the Al-Bireh suburb of Ramallah, which was established in 2004. No others exist or, as far as we know, are planned for the immediate future.

Urbanisation levels in Palestine have been relatively high for many years, but in the last 15 years the pace of urbanisation has considerably increased. Figure 5.11, below, shows the population balance between urban, rural and refugee camps as measured in the 1997, 2003 and 2007 censuses. While the vegetable industry in Palestine faces many difficult issues relating to the Israeli security measures and restrictions on trade it is too easy to overlook some of the compelling marketing forces when a consumer population is approaching 70% urbanisation. Urban consumers have distinct and different needs in terms of consumption, not just in vegetables but in all food products. They have a greater need for supply convenience - a need that in most developed countries is met by large supermarkets, and a consequent need therefore for greater economies of scale and more vertical integration in the value chains.

Population Base	% in 1997	% in 2003	% in 2007
Urban	46.6	53.1	68.7
Rural	46.9	31.0	25.9
Refugee Camps	6.5	15.9	5.4

Figure 5.23 – Rapidly Increased Urbanisation of the Palestinian Population

Israeli market

In 2009, Israeli demand for vegetables was 1,800,000 tonnes per year, mainly for tomatoes, cucumbers, and maize⁸. This is mostly satisfied by local production (1,600,000 tonnes, of which 390,000 are exported), with official imports accounting for 550,000 tonnes per year, of which 57,961 tonnes come officially from oPt (from small, medium and large farmers); half of it is cucumbers. The figure below summarises this information.

	Domestic demand	Local production	Imports	Exports
Volume in MT (2009)	1,800,000	1,600,000	550,000 (57,961 from oPt)	390,000

Figure 5.24 – Vegetables demand, production, and trade in Israel

Despite an increase in vegetable production (2.2% per year since 2000), and an increase in population (1.4% per year since 2003), Israeli demand for vegetables has been decreasing in the last years (-1.4% annual growth since 2003), and therefore most of that production growth has been targeting the export market (18% increase per year since 2000). Section 5.2 provides more detail on these trends for the specific fresh vegetables analysed in this study.

Compared with the local Palestinian market, the Israeli market demands more quality, testing, and improved packaging. Its development has been parallel with markets of the EU and the USA, driven by the greater drive for improved quality and consistency of delivery to both domestic consumers and Israeli's export markets. Thus, product quality standardisation, and especially improved packaging and presentation, are requested by Israeli buyers. However, for most of the cases the Israeli market is still not requiring Global GAP certification in the products it buys from oPt.

International market

The European Union has a well-developed vegetable production industry, notably in Spain, Italy and France. Spain in particular has extended its production supply season greatly through the use of plastic greenhouses and supplementary heating; Spanish investors are behind much of Morocco's export production in their attempts to attain year-round supply to their European buyers.

However, there are still significant gaps in some winter months (mostly between November and March) where Spanish and Moroccan production cannot compete with other sources of supply, such as Israel, Egypt and, potentially, the oPt. Therefore, the European Union tends to import fresh vegetables from countries outside the EU during that period. Germany, UK, France, and Netherlands are the biggest importers, and all of them have been registering an annual increase of

⁸ Sweet corn and baby corn

the quantity of fresh vegetables they import from developing countries. Figure 5.13 shows the extra-EU imports from the European Union (EU-27) markets.

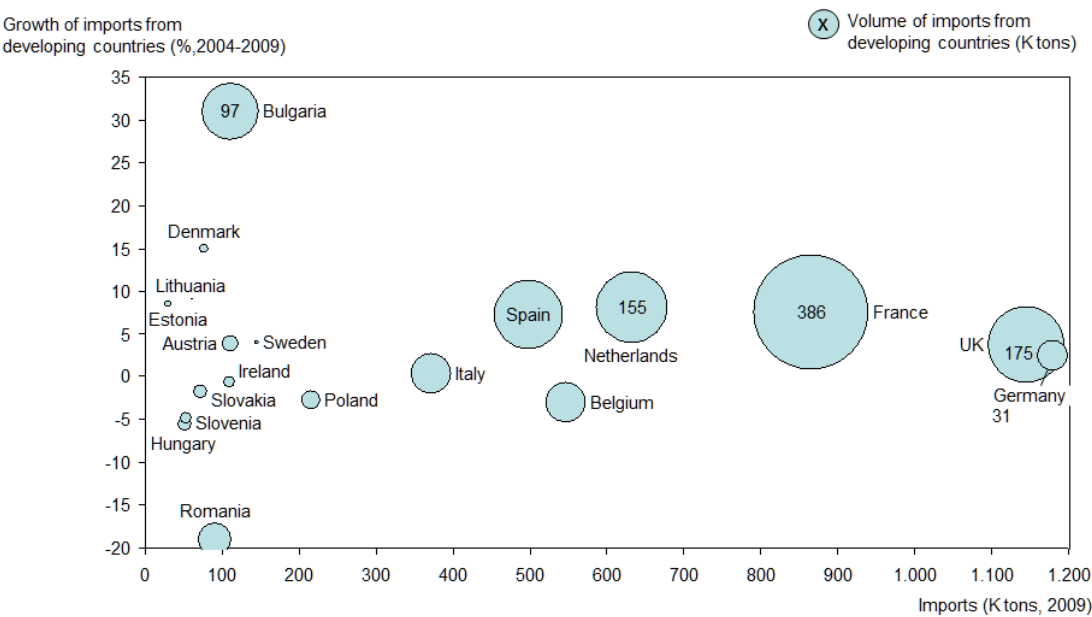


Figure 5.25 – EU-27 imports of fresh vegetables, 2009

Figure 5.14 shows that tomatoes, leguminous vegetables, onion, shallots, garlic and leeks are the main products that Western Europe imports during the November to March off-season.

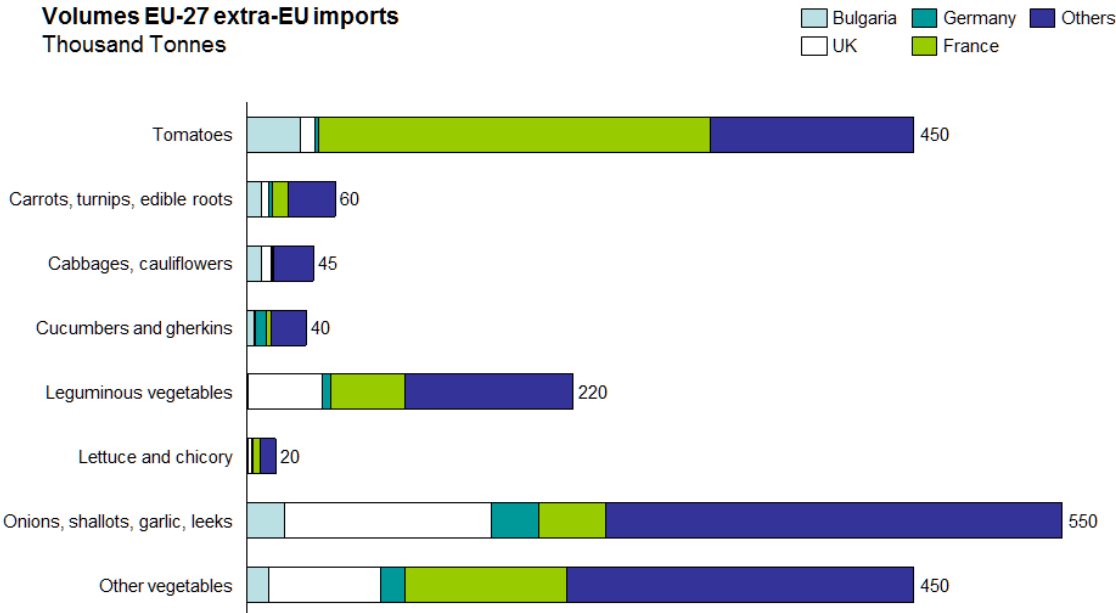
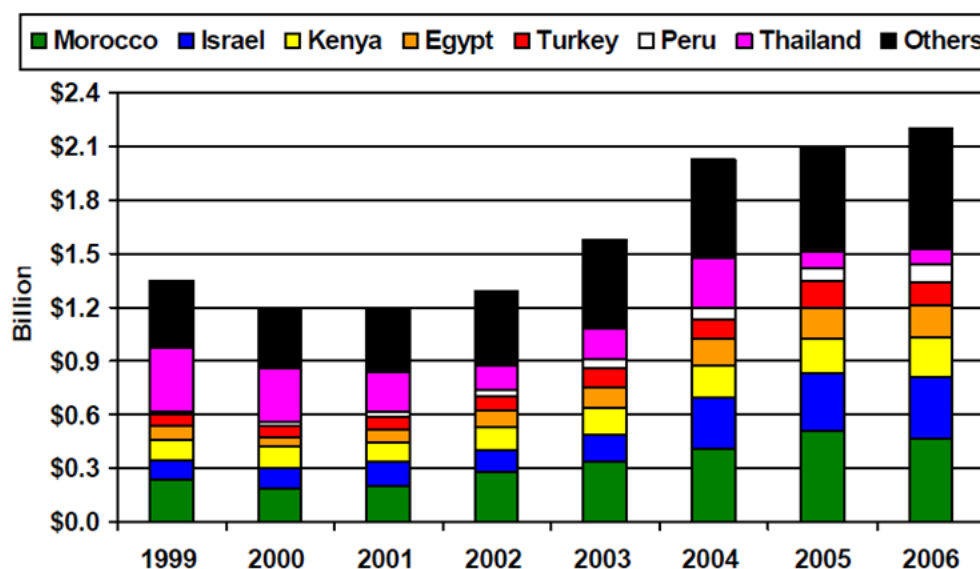


Figure 5.26 – Volumes of EU-27 extra-EU imports, 2008

These imports, as depicted in Figure 5.15. come mainly from Morocco, Israel, and Kenya.

EU (External Trade) Imports of Fresh Vegetables*
\$ Billion



* Includes potatoes

Figure 5.27 – Origin of EU-27 extra-EU imports by value, 1999-2006

In terms of the specific crops analysed in this study, sweet pepper imports have increased substantially during the last decade; the EU-27 has been importing around 1.1 million tonnes annually recently, of which 20% comes usually from outside the Union (primarily Israel, Morocco, and Turkey). These imports from outside the region usually bring an average of €1.04 per Kg (CIF price).

Regarding cucumbers, and as depicted in Figure 5.11, imports from outside the EU accounted for 40,000 tonnes in 2009, mainly from Turkey and Morocco. These imports from outside the region are usually paid an average of €0.73 per Kg (CIF price).

Finally, the EU-27 imported in 2009 450,000 tonnes of tomatoes from outside the Union (see Figure 5.15). These imports were mainly from Morocco, Israel, Tunisia, Turkey, and Macedonia, and were paid an average of €0.76 per Kg (CIF price). This average takes into account all types of tomatoes. It is estimated that prices of cherry tomatoes (mainly imported from Israel) are on average €1.29 per Kg (CIF price). It is, however, important to note that there is substantial re-export from leading Western European importing countries (presented in Figure 5.13), mainly as re-distribution across the EU as well as to other non-EU markets such as Eastern Europe, Central Asia, and the Gulf markets. In actual consumption terms, the traditional Western European markets have been almost flat during the last 5 to 10 years, and in some countries per capita vegetable consumption has dropped slightly, despite efforts from the EU and trade organisations to increase consumption. These efforts have been driven by the desire to combat rising obesity and improve health, and focused on convincing Europeans to eat the recommended five portions of fresh vegetables and fruit per day.

High quality and food safety standards must be met to access Western European markets, and access is made more difficult still because of the high level concentration of supply chains in the hands of just a few, mainly multinational, supermarket companies, such as Carrefour, Tesco, Aldi, etc. The prices paid by these supermarket buyers are currently being driven down by the ongoing economic crisis of the last few years. The key features of the EU and Gulf markets pertaining to fresh vegetable exports from oPt are detailed in Appendix 3.

Most of all new EU market growth has come from the new EU members in Central and Eastern Europe (Bulgaria being a particularly attractive market, given the lower quality requirements than Western European countries, and a growth of more than 30% in the import of fresh vegetables from developing countries, as depicted in Figure 5.13) due to improving economies in those countries as well as the rapid spread of the major EU multiple retailers (Tesco, Carrefour, etc.) into these new territories. Central Asia (mainly Russia and Kazakhstan) and the Gulf region (mainly Saudi Arabia, United Arab Emirates (UAE), and Qatar) are also important importers of fresh vegetables. These countries have more relaxed quality and certification requirements than Western Europe, but are still looking to Global GAP as the minimum market entry standard.

In Central Asia, of the five ex-USSR “stans” (Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan), countries with higher incomes (namely Kazakhstan and Turkmenistan) are doing better than others based on natural resource exports (mainly oil and gas). However, the political and economic situations in most of these countries remain somewhat unstable, with the situation in Kazakhstan being the most favorable.

Kazakhstan, despite relatively high domestic production, is the most attractive import market as it has a much higher standard of living than other countries in the region. In 2009, the country imported 36,000 tonnes of fresh vegetables (72% more than in 2006), mainly onions (13,000, 697% increase from 2006), tomatoes (7,000 tonnes, 5,844% increase compared to 2006), and cucumbers (4,000 tonnes, 7,138% increase from 2006).

The other 4 ex-USSR “stans” countries have been increasing production to grow their own export trade, and imports to these markets are very limited (and are mainly cheap imports from China). 80-90% of the fresh and processed fruits and vegetables exported from these countries go to Russia, which is the largest fresh produce market in Europe. In this market, consumers have a large appetite for cheaper and lower quality fruits and vegetables. However, importers and distributors in the Russian market do recognise the advantages of GlobalGAP certification and it does therefore offer leverage in price negotiations. The Russian market is therefore another market worth exploring in Central Asia, in parallel with Kazakhstan.

In the Gulf region, Saudi Arabia, UAE, and Qatar are the most attractive markets, as depicted in Figure 5.12. Domestic supplies in the Gulf region are restricted to a short period (mainly March and April), after which the market rely largely on imports of fresh produce.

As examples of types of products imported, in 2006 the Gulf Region imported 466,000 tonnes of tomatoes, mainly from Syria (55.7%), Jordan (36%), Netherlands (2.3%), and India (1.4%). In 2009 UAE imported 794,000 tonnes of fresh vegetables, 29% from India, 15% from Jordan, 13% from Saudi Arabia, 10% from Iran, and 9% from China.

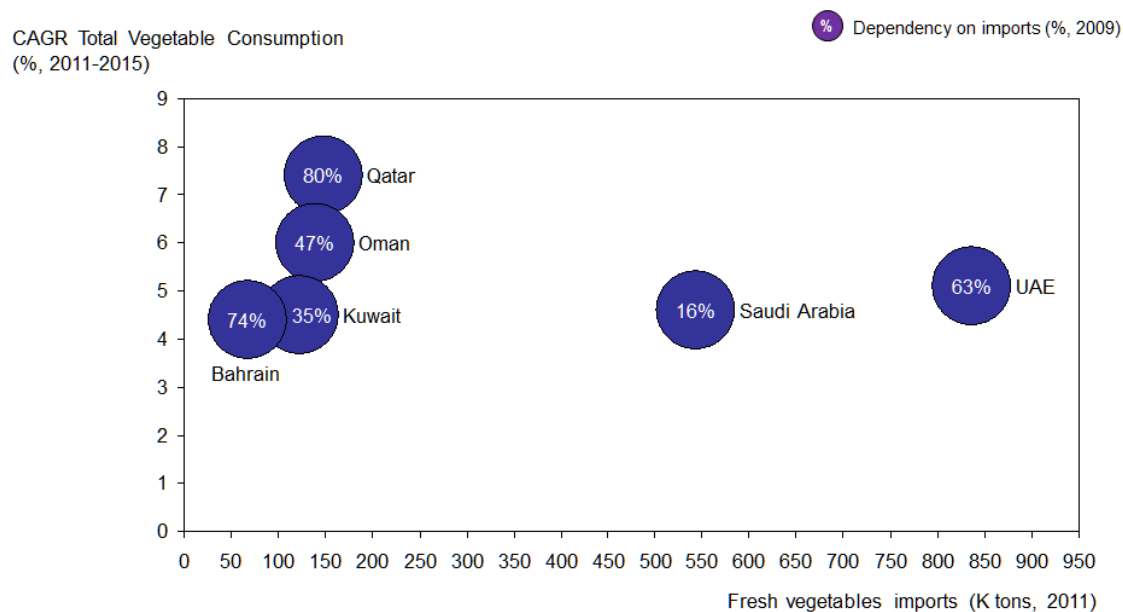


Figure 5.28 – Vegetables import and consumption in the Gulf Region

It is important to note that there is a dual trade structure in the Gulf markets, especially in Saudi Arabia and UAE (as detailed in Appendix 3), with a clear distinction between a modern retail segment with quality standards more on a par with the EU market, and the larger, but much less sophisticated traditional wholesale segment.

Given the strong linkages that oPt has with these markets (for instance, due to a high presence of the Palestinian diaspora, which has a sympathy towards Palestinian products), oPt can potentially have preferential access to them, mainly to the traditional wholesale segment, where business relationships tend to be more informal.

Despite the higher quality requirements needed to serve the export market (mainly Western Europe), there have been examples of successful exports of fresh vegetables from oPt:

- Sinokrot, the biggest exporter of fresh vegetables in oPt, is currently exporting cherry tomatoes to Europe, Russia, and the Gulf region
- Moon Valley has been arranging imports of herbs to the Western European market, much exported by Sinokrot, although they are diversifying their sourcing. They plan to arrange imports of fresh vegetables (cherry tomatoes and sweet peppers) into Western Europe in the future
- A large Palestinian farmer is currently negotiating entry into one of the main Western European countries with a major retailer, and plans to export fresh vegetables
- Before the closure, Gaza used to export about 8,000 tonnes of vegetables (mainly tomatoes, potatoes, and sweet potatoes) to Arab Gulf nations. This year, and despite the ban on exports, a cooperative in Rafah (south Gaza) with 100 farmers (77 of them with GlobalGAP certification) exported fresh vegetables to Western Europe with the support of a Dutch funded programme that was able to secure the approval from the Israeli authorities to export. The trial involved the export of around 6 tonnes of cherry tomatoes and 5 tons of sweet peppers through an Israeli export company (Agrexco). According to (Bader, 2011), next year they are planning to continue this export, and expand into 100 tonnes of cherry tomatoes and 150 tonnes of sweet peppers. This cooperative has been exporting since 2004 and, in 2006 (before the closure), it exported 433 tonnes of cherry tomatoes. Farmers profit 4.5 NIS for each kg of sweet pepper and 3.5 NIS for each kg of tomatoes

Market linkages and dynamics

From the producers' perspective the available domestic market channels are:

Farm gate: where farmers sell direct to local merchants for cash; these prices are the lowest in the marketing system -- the principal relevance is to small farmers without the means to transport produce to the main domestic marketplaces.

Wholesale markets: There are nine central markets in the West Bank and three in Gaza. These are basically buildings (including offices) and stalls, with no cold chain facilities. They operate seven days a week, generally from 3am to 8pm, though this varies between markets according to flow of trade and management practise. Farmers have to transport their produce to these markets, a major factor in the value chain which has been adversely affected by the security closures. Once at the market the sale is largely governed by middlemen rather than direct sales to wholesalers in the market, and consequently prices obtained by the farmers are below the daily wholesale prices due to middlemen commissions and market charges. These markets have doubled in number since 2000 as a result of the closures and farmers' inability to reach the traditional central markets of Nablus, Jenin, Tulkarem, Jericho and Hebron. While the new facilities have improved farmers' market access, most of them are not attracting enough buyers nowadays as movement restrictions have been eased. As a result, the prices farmers get from selling their products in these markets are less than what they would be able to get in the traditional markets. These markets, however, continue to be an important market channel for small-scale farmers who do not own trucks or can't afford to hire trucks to transport their small quantities of products to the traditional central markets.

Through merchants: Some merchants buy and collect the farmers' products from collection points in the production area rather than from the farm directly. This method saves some of the transportation costs and commissions, and saves the farmer marketing time. In some cases the merchant pays the farmer in advance to cover family and farm expenses.

Direct sales to consumers: A few small-scale farmers in the West Bank sell their products directly to the consumers, whether at the farm-gate or at the corners of main markets, but this channel is only suitable for very small quantities of products and takes up valuable time. However, for some farmers this presents the best price alternative and many consumers seem to prefer it.

Contractual marketing: This channel is mainly applicable to vegetable crops destined for processing, such as cucumbers for pickling and tomatoes for paste production. The farmer signs a contract with the factory to produce a certain quality and quantity of product with agreed delivery dates and a guaranteed price. In some cases, the processor will provide some advance payment to cover part of the production costs.

Due to restrictions on farmers' ability to market their products directly in Israel as well as restriction on Israeli traders' access to the West Bank and Gaza Strip, an increased use of local middlemen is reported. Before the second intifada, small farmers used to sell directly to Israeli middleman, but that no longer happens due to the back-to-back transport policy at the checkpoints. This policy establishes that to move cargo across a checkpoint, two trucks (coming from opposite sides of the checkpoint), must meet at the checkpoint and the cargo has to be offloaded from one of the trucks into the other, after being inspected. However, back-to-back operations are performed in an open area, where refrigerated goods are obliged to be offloaded into open inspection stations, and inspections can take as long as five hours, which can result in substantial damage to the vegetables. Furthermore, the need to use two trucks instead of one increases the transaction costs.

Among the top three preferences of small farmers when selling their products is immediate payment. When they sell to the central market, they receive weekly payment; however, when

selling to the local middleman, they only receive monthly payment. Based on discussion during field visits, recent farmer margins for the domestic market are typically 17% for cucumber, 21% for hot pepper, 40% for cherry tomatoes, and -10% for sweet peppers (i.e. sales apparently at a loss), but these margins vary according to the agro ecological zone and farmer expertise and some farmers are still able to profit from production of peppers.

The post-harvesting and packing losses are reportedly negligible, below 5%, but probably underestimates losses sustained by market traders for unsold produce and direct post-harvest spoilage losses suffered in consequence of lack of refrigeration and poor handling.

The local central markets belong to the municipalities, who rent stalls to agents for a fee. These markets are not fixed structures, but open spaces where sellers and buyers gather once or twice per week at pre-established schedules. Much of the produce is sold through open auction.

Central Market Agents charge a 10% commission on the sales, and this commission is typically paid by the farmer (however, in some situations, the farmer pays 6% or 7%, and the rest is paid by the retailer). From the local markets, the product typically goes to local traders who then sell, with a typical margin of 10%-20%, to retailers. It is also common for Israeli middlemen to buy from local markets (through a Palestinian middleman) and sell the product in the Israeli retail shops or, less commonly, to Israeli processors or to Israeli exporters. Less often, local consumers buy directly from the central markets. The retailers, who prefer a one stop shop, reliable suppliers, and attractive payment facilities, sell their product by weight.

It is apparent that the vegetable value chain continues to operate with considerable levels of informal credit between almost all stakeholders and the lack of formal credit availability means that in many cases traders' margins have to be increased to cover the risk in vegetable marketing when faced with security closures and other time-sensitive issues affecting transport and delivery of fresh produce. While the team was unable to investigate price formation and margins at each trading point in the domestic market it is likely that the prices obtained by farmers are lower than might be possible if formal credit was more readily available.

Cooperatives usually sell their product either to Israeli middlemen or to local central markets through truck owners that charge 2-3 NIS per box. Less commonly, they sell to local packing houses (less than 3% of the volume that goes into packing houses comes from cooperatives) or to an Israeli middleman. However, most cooperatives are still not engaging in aggregate sales of member's produce, where the cooperative assumes title, and hence marketing risk for the produce. This lack of business enterprise by the cooperatives is allowing a remarkable loss of leverage in transactions, where collective volumes of produce would naturally ensure better prices as well as an opportunity to sell direct to major wholesalers rather than through middlemen. Although cooperatives were very interested in export markets and agreed to serve as pilots for international programmes to get the needed certifications, due to the poor business model followed and weaker than expected returns, cooperative members lost trust in their business partners. There are on-going discussions about supporting the creation of regional federations of cooperatives to establish the needed infrastructure to develop collective marketing on behalf of their members, but still doesn't address the basic point that few cooperatives are providing adequate marketing services for their members' produce. Few cooperatives, and none of those interviewed, have an agreed and operative business plan and thus important factors such as production and marketing planning are not properly addressed. In any case, creation of a federal marketing establishment would almost certainly entail investment in cold chain facilities so that farmer members could reliably engage in export marketing as well as direct marketing to major wholesalers in the domestic market.

In Gaza, where the Israeli security measures have most harshly affected marketing opportunities for all producers, the farmers have a stronger tradition of collective marketing of the cooperative members' produce. The present prospects for further success in Gaza is heavily mitigated however, by the border closure. At present, very limited exports are allowed by the Israelis to Western Europe from Gaza, but none are allowed into the more proximate and less demanding Israeli and West Bank markets. In the West Bank, farmers have more diverse marketing options. Yet, there has been less drive perhaps to cement loyalty and trust among cooperative members.

Medium and large farmers sell mostly to the local central market or local packing houses. A minority of farmers (less than 3%) sell to an Israeli middleman. The local packing houses either produce their own vegetables, or buy them from medium and large farmers or (for less than 3% of their requirements) from cooperatives. The packing houses sell their product to one of the 3 Israeli exporters (who have their own trucks) or, less often, sell directly to the international markets.

Domestic production

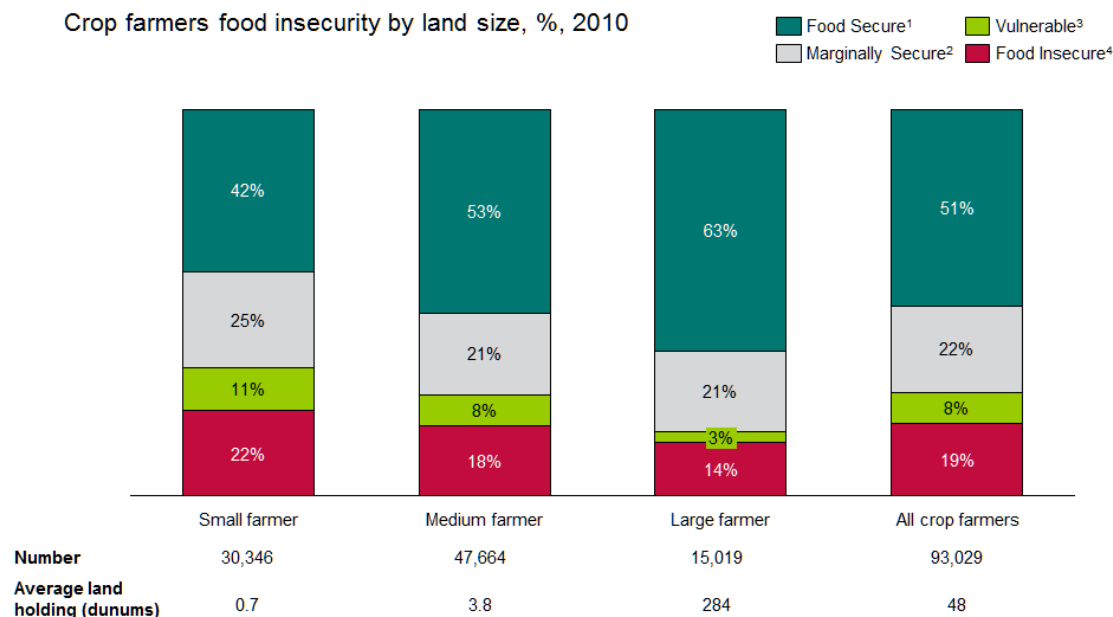
There are around 97,000 crop farmers in oPt, the majority (estimated at 50%-70%) regularly involved in vegetable production. In 2008, these farmers produced 696,548 tonnes of vegetables (3.8% annual growth since 2000) on 186,000 dunams of area (0.7% annual growth since 2000). 80% of the total area dedicated to vegetable production is irrigated, and 30% of the irrigated area is protected under greenhouses.

These vegetable farmers, in more than 95% of the cases, use seedlings that are produced in oPt in one of the 30-50 existent vegetable nurseries. Usually each governorate has a number of nurseries who sell within the area: for instance, in Jericho there are 4 nurseries (the biggest one buying 2 million seeds a year); in Gaza, there are 7 nurseries, and a typical one (e.g. "Liberation Nursery") also buys 2 million seeds a year. There is no local seed production as it requires high technology equipment, adequate weather, lack of diseases, good varieties of plants to produce the seed, and isolation from agriculture areas (to avoid genetic crossing). Therefore, the seeds are imported, mostly from Israel and Europe, through a Palestinian middleman. Less often, Palestinian nurseries deal directly with foreign seed suppliers, without a presence of a middleman. There is no shortage in the access to seeds.

In terms of production, it is estimated that small farmers⁹ represent 80% of the total farmers, but account for less than 50% of the total production. The majority of small farmers (60%) are either share croppers, or tenant farmers. More primary research is needed to understand the specific problems sharecroppers face, besides the ones they certainly share with the other small farmers and that are presented in this report. As depicted in Figure 5.17, the small farmers are the ones most affected by food insecurity, with one third of them being either food insecure, or vulnerable. Although the data refers to crop farmers in general and not vegetable producers in particular, it is believed that this situation also occurs in the case of vegetable farmers.

⁹ A small farmer is defined as cultivating up to a combined total of 20 dunams of open field, and/or 3 dunams of greenhouses, per year

Crop farmers food insecurity by land size, %, 2010



Source: "Socio-Economic and Food Security Survey", PCBS, WFP, FAO, 2010; "Farming Households' Food Security in WB and GS - An Overview", FAO, 2010
 1 Households income AND consumption above \$6.2 per adult/day OR \$5.1-\$6.2 without decrease in total food and non-food expenditures
 2 Households income OR consumption above \$6.2 per adult/day (not both) OR \$5.1-\$6.2 of income AND consumption without decrease in expenditure patterns
 3 Households income AND consumption below \$6.2 per adult/day, EXCEPT households showing no decrease in expenditure patterns
 4 Households income AND consumption below \$5.1 per adult/day OR showing decrease in total food and non-food expenditures

Figure 5.29 – Crop farmers food insecurity by land size

Women ownership of production is very limited, and happens in less than 5% of small farmers' households. The top priorities of small farmers when selling their products to the market are immediate payment, good price, and the possibility of selling unlimited quantities. Less than 2% of the farmers have Global GAP certification: according to (Bader, 2011), there are 223 farmers in Gaza and an estimation of 450 farmers in the West Bank with this certification. Of these farmers with Global GAP certification, this year only 77 in Gaza (organised in a cooperative) and 50 in the West Bank did exported.

Small farmers vary considerably in production and marketing capacity and capability. Some are relatively aware of the potential of export markets and have made some investments in improving their productivity and quality, but many are still operating from a traditional and subsistence mindset, growing food to feed their families first and marketing any surpluses. Any new developmental initiatives will have to take into account the range of readiness levels, and lead with incentives for the more advanced farmers, helping them achieve greater success and using that success to demonstrate the value to the smaller, poorer and less entrepreneurial farmers. Chief amongst these new developments should be planned production at the farm-level and overall better business planning at both the farm and cooperative levels. The need for greater crop diversification has often been highlighted in previous and on-going development efforts but many farmers are finding that consumers are still focused on the major staple vegetables of squash, cucumber, tomato and eggplant, and consequently when the farmers have been brave enough to diversify they face problems of marketing the new crops. This is also a problem for those farmers that attempt to engage in export production as they struggle to find a local market for surplus produce and outgrades, etc.

Post harvest activities for products that will be sold in the domestic market are limited; farmers usually box the produce in plastic or wooden crates, often putting the highest quality produce on top. This process is characterised by low quality control, minimal grading (or even non-existent), poor inspection, basic packaging techniques, and limited storage and handling facilities. In all developed fresh produce value chains, the creation and adoption of produce marketing standards

that apply uniformly to produce quality, size grade, as well packaging form, dimensions and weight, are fundamental to successful trading. Standards bring confidence to all stakeholders in the value chain and allow for objective measures of performance or indeed non-performance in trade disputes. The relative lack of produce and marketing standards at the domestic level in Palestine is almost certainly blocking the improvement in marketing practises and institutions and needs to be urgently addressed.

Figures 5.18 – 5.21, below, show the cost of production of cherry tomatoes, sweet pepper, hot pepper, and cucumber, respectively.

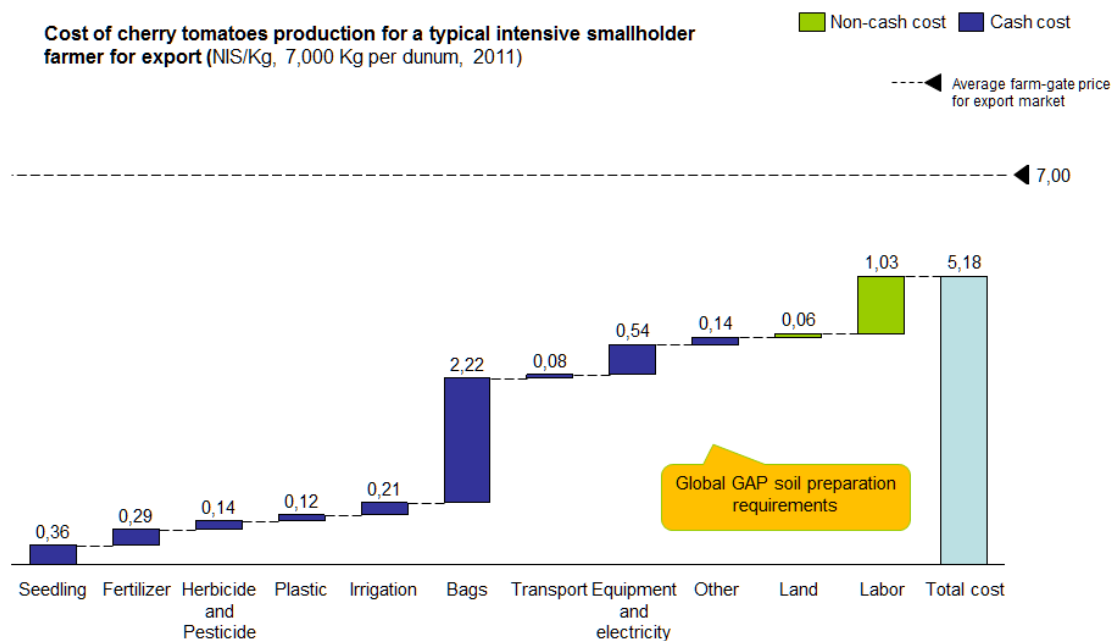


Figure 5.30 – Cost of production of cherry tomatoes for the export market

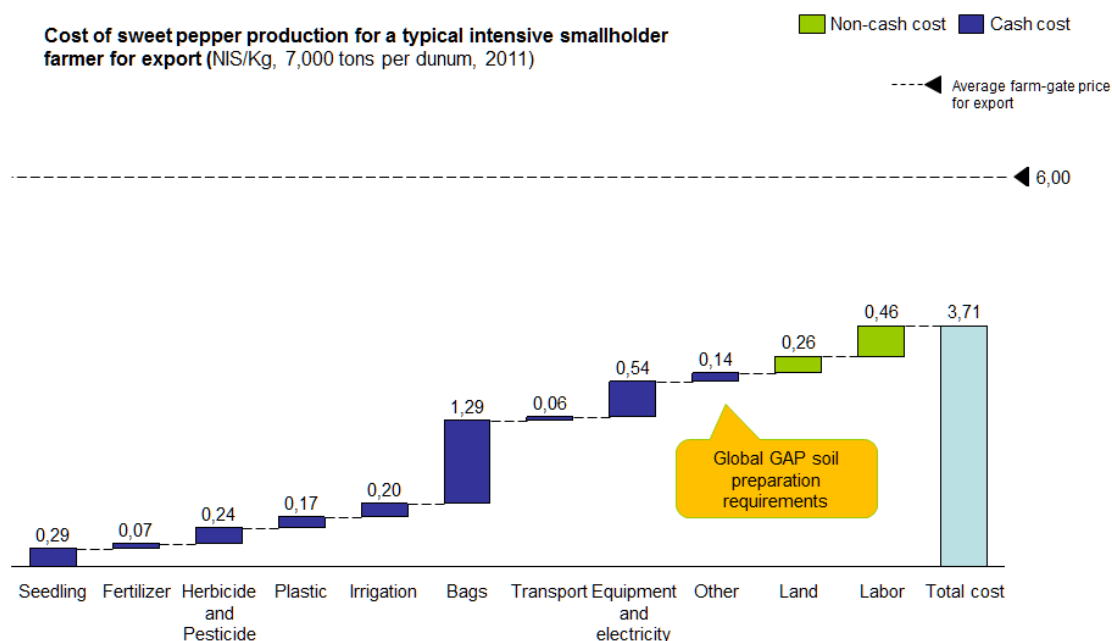


Figure 5.31 – Cost of production of sweet pepper for the export market

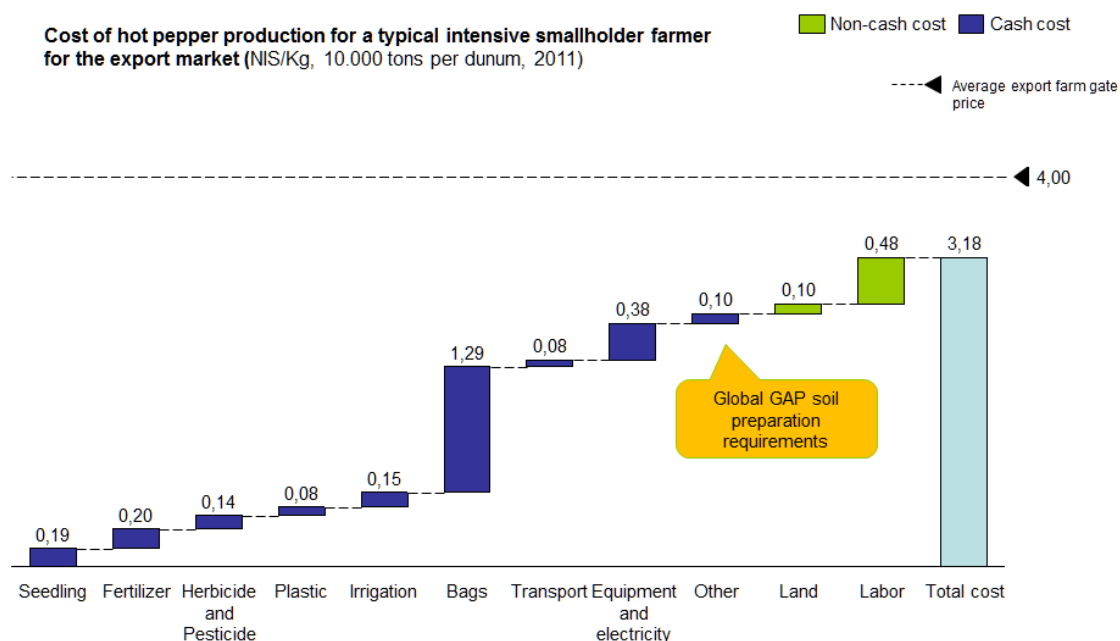


Figure 5.32 – Cost of production of hot pepper for the export market

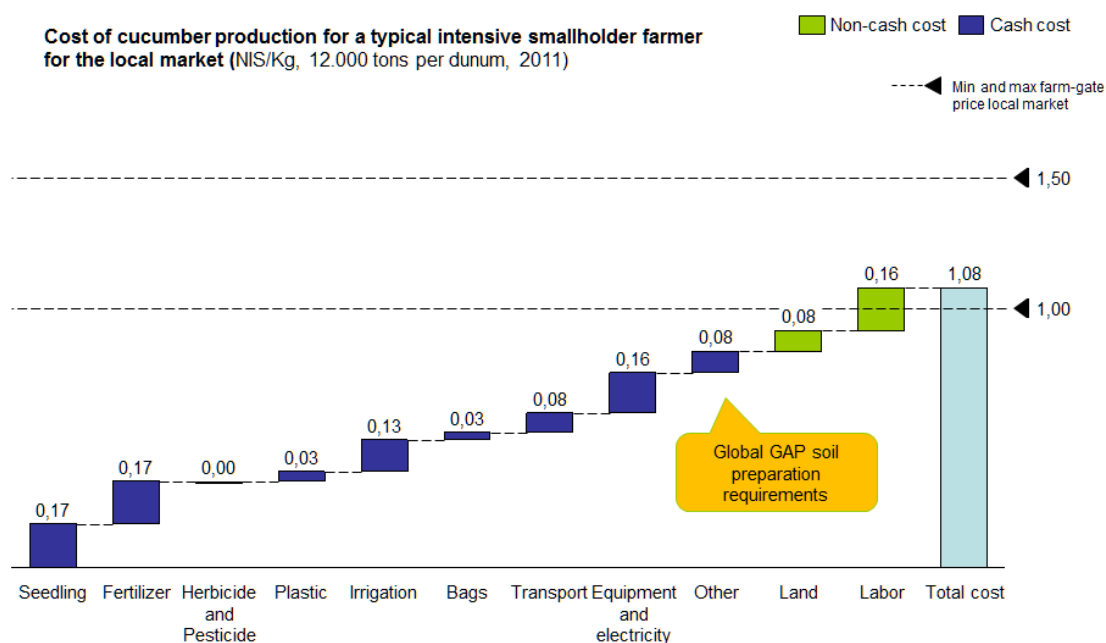


Figure 5.33 – Cost of production of cucumber for the local market

Cooperatives are the traditional model of farmer aggregation in oPt, and have been operating for the last 80 years. The Palestinian National Authority gives great importance to the development of cooperatives, and has recently issued a development strategy for the sector. Figure 5.21, based on (Union, 2011), (Labor, The Strategic Plan of the Cooperative Sector in Palestine 2011-2013, 2011, p. 6), and (Labor, Agricultural Cooperatives in the West Bank - Diagnostic Study, 2011, p. 2) shows the number of cooperatives existent in oPt.

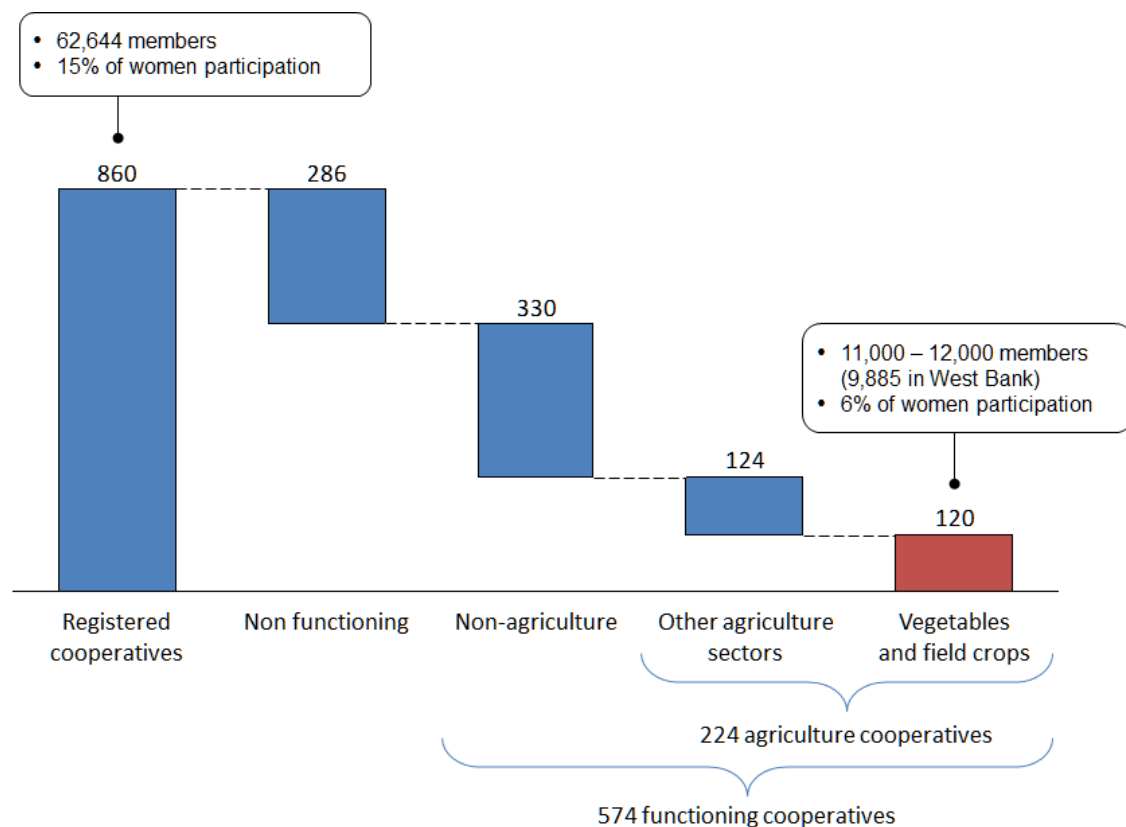


Figure 5.34 – Number of cooperatives in oPt

There are around 120 functioning vegetable and field crops cooperatives in oPt, the majority involved in vegetable production. According to (Union, 2011), in the West Bank there are 113 active vegetable and field crops cooperatives, the majority of them in the governorates of Ramallah and Al Bireh (24 cooperatives), Hebron (19), Jenin (15), and Tulkarm (13). According to (Union, 2011), the West Bank plant crop cooperatives have a total of 9,885 members, with an average of 87 members per cooperative. However, this average hides a significant variation:

- 16 cooperatives have more than 100 members (and the three biggest have between 1,120 and 1,293). These are multi-commodity cooperatives at the governorate level, and usually provide more services to their farmers (like seedlings, or special machinery) than the smaller cooperatives
- 31 have between 40 and 99 members
- 66 have between 10 and 39 members

In Gaza, the size of the cooperatives range from 100 farmers (e.g. Agriculture Cooperative for Vegetable Production, in Rafah) to 1,000 farmers (e.g. Green Houses Farmers' Cooperative, in Khan Yunis).

It is estimated that 50% of small vegetable farmers are members of cooperatives. The main role of these cooperatives in the West Bank has been to provide input services to their farmers, although they are increasingly becoming more business oriented and engaging in marketing activities. In Gaza, the most common services provided by cooperatives are training in conservation farming techniques, support in Global GAP implementation, quality control, marketing of products (although representing a small share of the marketing function in Gaza as the number of vegetables cooperatives there is small), and input on credit. In both regions women's role at leadership level is limited, and the majority of the cooperatives have less than 20% of women representation in the executive board.

While successful in some cases, the implementation of the cooperative model in oPt has been challenging, and a significant number of cooperatives are not providing adequate services to their members. Greater homogeneity of farm size, a broader range of services provided by the cooperatives in Gaza, better developed business acuity, and historically stronger interest from Israeli exporters who provided training, helps explain greater cooperative success in Gaza.

Medium and large farmers¹⁰ represent 20% of the total farmers involved in vegetable production, but reportedly account for more than 50% of total vegetable production and the majority of exports. Some of the large farmers are vertically integrated and have their own packing houses.

There are 15 packing houses for fresh vegetables in oPt, but only 4 of them are active. There are two operational fresh vegetable packing houses in the West Bank. The biggest and most technically advanced of these is owned and operated by Palestine Gardens (a Sinokrot Group company) in the Jordan Valley, and it dominates the export market of fresh vegetables in oPt. The other active packing house in West Bank belongs to a marketing company in the Jordan Valley, but was only established very recently.

The Palestine Gardens Company was established in 2008 with support from USAID. The company holds certifications on Global GAP, BRC (British Retail Consortium)¹¹, and ETI (Ethical Trading Initiative)¹² standards. It packs and exports cherry tomatoes (around 1,500 tonnes this year, to the UK, Sweden, Germany, and Russia), dates (between 1,000 and 1,500 tonnes this year to London and the USA), and sweet peppers (around 1,500 tonnes this year). For the European market, the company exports through one of the Israeli ports (it takes 10-14 days to arrive to Europe or Russia), while exports to the Gulf Region go through Jordan. In both cases, Israeli export companies are used.

The packing house has 2,500 square metres and is situated 15-20km away from the centre of Jericho. It has the capacity to package 15,000 tonnes per year (77% of which is currently unused), divided in three lines of production: two automatic lines for cherry tomatoes and sweet pepper, and one manual line for date palm. The packing house employs 60-70 people, of which 30 are for packaging dates (usually sold between mid-August and mid-October), and 30-40 for packaging fresh vegetables (usually sold between mid-November and mid-May).

70% of the current needs are being satisfied by the company's own production of cherry tomatoes and sweet peppers, on 120 and 95 dunams respectively of greenhouses owned by the company. The remaining 30% are bought from farmers in the Jericho area and in the North of West Bank.

Based on discussions held during the visit, there are four major problems the company is facing:

- Water scarcity and low quality. Palestine Gardens reported oPt water salinity between 3ppt and 8ppt (ppt = parts per thousand - the upper limit on agricultural irrigation water is generally considered to be ~2ppt), compared with reported levels in Israel of between 0.5ppt and 0.7ppt. They attribute this as being the major reason why they are achieving 7-8 tonnes of sweet peppers per *dunam*, while an Israeli neighbor is achieving 10-11 tonnes.
- Poor linkages with the small farmers, based on previous failed interactions. There are three major reasons for this, according to the company:
 - The training that the company provides to farmers is harder to give when there are many smallholder farmers to train;

¹⁰ More than 20 dunams of open field or more than 3 dunams of greenhouses

¹¹ Designed to assist retailers and brand owners produce food products of consistent safety and quality

¹² Certifies that the organisation is fulfilling all social obligations and fulfils the social compliance expected of it

- The quality control of the product is harder when there are many small-scale sources;
- Traceability (in case of a rejection from the buyer) is harder when the rejected container has product from several farmers
- Lack of cold trucks to transport the vegetables and dates from the farmers to the packing house (vegetables should be kept within 7°-12°C, while dates should be kept between 0°-2°C)
- Interruption of the cold chain during checkpoint inspections, which makes the product susceptible to be damaged

In Gaza, there are 13 packing houses for fresh vegetables, but only 2 of them are active. The active packing houses belong to cooperatives, and are small, each with a capacity to package 130 tonnes of fresh vegetables per year and currently operating at around 5% of capacity serving the local market. The 11 inactive cooperatives belong to the PNA and are situated in the evacuated Israeli settlements; their joint potential capacity is around 1,000 tonnes per year.

Inputs

The vegetable sub-sector, like all components of the agriculture sector in oPt, is highly dependent on imported inputs to support its production base. In the West Bank, agricultural chemicals - fertilisers, herbicides, pesticides – used for plant crop production are usually imported from Israel through a local middleman; while in Gaza a significant share of chemicals (usually of much lower quality than the ones imported from Israel) is smuggled from Egypt through the tunnels in the South of Gaza. Prices of fertilisers, both in the West Bank and in Gaza, vary between 2.2 NIS per Kg and 6 NIS per Kg, depending on the quality. Organic fertiliser produced locally, usually costs around 0.2 NIS per Kg, but supply is limited by the current state of development of the livestock sub-sector.

Irrigation and other horticultural equipment, such as sprayers and greenhouse materials, are also imported and thus relatively expensive because they suffer consequent difficulties in importation logistics through the Israeli checkpoints.

There is no domestic seed production in oPt for vegetables or herbs. This is because seed production requires high-technology equipment, particular climatic conditions, inherently low incidence of pests and diseases combined with comprehensive pest and disease control, good varieties of locally adapted plants to produce the seed, and an ability to isolate production from other agriculture areas (to avoid genetic crossing). These requirements make local vegetable and herb seed production unattractive, and therefore they are imported, either from Israel, or from more distant origins, like Europe. In both cases, it is usually an Israeli middleman who links the seed provider with the Palestinian buyer, although there are some cases where the Palestinian buyer is linked directly to suppliers in Europe. When producing most vegetables and herbs, the seed cannot go directly into the field. It has to be grown into a seedling in nurseries. There are 30-50 vegetable nurseries and also some herb nurseries in oPt. The majority (more than 95%) of vegetable farmers buy their seedlings from these local nurseries, whether or not they are planning to produce to a higher quality export market. For herbs, however, farmers that intend their herbs to be exported tend to buy (higher quality) seedlings from Israel.

There are certain types of fertilisers that are banned from being imported due to Israeli concerns regarding their potential “dual use”. This has a negative impact on agriculture productivity as it often makes it impossible for farmers to have access to the most appropriate fertiliser that meets their needs. According to (Rabboh, 2011), productivity could increase 5%-15% if the prohibited fertilisers were made available.

Enabling environment

The Ministry of Agriculture currently provides most extension services. Based on (Development, 2009, p. 42), and corroborated during the field visits, they are largely inadequate and of poor quality. This is mostly caused by:

- Lack of extension service resources (human and financial), especially at the village level and in remote areas
- Poor operational support to the extension services
- Lack of applied training and incentives for excellence among extension workers
- Lack of incorporation of farmers' feedback on their perceptions of the extension services' training and support

In addition there are increasing concerns over the nature of extension delivery with considerable emphasis placed on the technical components of the improved practises but insufficient attention to building business skills or the supporting information on the real economic benefits of adopting the improved practises/technology. Farmers, particularly small farmers with minimal resources, need to understand what the return on the investment will be before they can commit to any changes in their current practises. Donor support in some sub-sectors, notably olives, has resulted in some excellent and effective technical extension messages, but anecdotal evidence from field visits indicate that these technical messages are only adopted and effective when delivered with an accompanying explanation of the costs to be incurred and the improved returns to be achieved from the investment.

Access to finance is very challenging for the smaller farmers. Most agricultural enterprises are self-financed by farmers or with the help of cooperatives, and there is no ready availability of financing from local development or financial institutions for agriculture equipment or inputs. On the supply-side, there is a lack of both commercial finance and micro-finance institutions that see providing financial products that respond to farmers' requirements as an attractive commercial prospect (e.g. credit products that offer adequate grace period). And, as in many parts of the world where agriculture is seen as a marginal economic activity, it is perceived as a high risk area. On the demand-side, there is a lack of scale, organisation and aggregation of financing needs among farmers, cultural beliefs that discourage taking conventional loans, and lack of market information and security of sales prospects for their produce, which makes the farmer unsure about his/her capacity to pay back.

This challenge around access to finance constrains farmers and their limited organisations from considering investing in a coordinated manner in value-enhancing or value-adding assets, such as larger greenhouses; washing, sorting and grading facilities; cooling facilities; and transportation assets. Equally, it appears that vegetable traders could also benefit from improved access to formal finance and credit and could possibly benefit from development support in improving their business operations and especially in preparation of bankable business plans. Cold chain infrastructure such as transportation and storage is an important component for the improved domestic marketing of fresh produce as well as improved export marketing, and more investment is required for improvements and upgrading of the existing cold chain.

The main road infrastructure is good, though there is some rehabilitation needed on feeder roads. However, this is not a major bottleneck.

Public agricultural institutions have been established in a relatively good manner, and there are NGOs covering the majority of agricultural development components. The Palestinian National Authority plays a major role in making general policies that support the introduction of legislative and regulatory amendments to promote investment and strengthen agricultural development. It also

carries out a pioneering and supportive role in restructuring public institutions that provide basic services to the agriculture sector.

The Ministry of Agriculture performs primary duties in the regulation and management of the agricultural sector, focusing on planning; drafting of policies, strategies, laws and regulations; service delivery; implementation of projects; development of natural and agricultural resources; and fighting plant and livestock diseases and pests. It carries out its assigned mission from its main offices in Ramallah and through 16 Agriculture Directorates, employing a total of 1,409 staff members, half of whom work in the West Bank. In 2008, budgetary allocations were approximately NIS 72 million.

In terms of public bodies, three agricultural commodity councils were established as semi-government bodies: Palestinian Olive Oil and Olive Council; Milk Council; and Grapes Council. These councils set up frameworks that regulate the working relationships of the stakeholders.

A total of 35 Palestinian and 15 foreign NGOs and civil society organisations operate in the field of agriculture. A large portion of donor funds is channeled through NGOs and civil society organisations.

The following table summarizes the differences between the West Bank and Gaza:

Areas of Difference		West Bank	Gaza
Access to Inputs	Seed	Yes	yes
	Fertilizer	Yes but shortage of some varieties, as determined by Israeli regulations	Few kinds only; shortage in potassium and nitrate fertilizers (due to Israeli double use concerns)
	Pesticides	Yes	yes
	Materials	Yes	yes
	Finance	No	no
Pack house Infrastructure		4 units, two with efficient infrastructure	2 operating units (another 9 not operating)
Capacity of Farmer Organisations	No. Members	113 organizations with average of 87 members	4 organizations with members ranging from 100 to 1,000
	Collective Marketing	Some organisations are active in collective marketing	One organisation active
	Access to Credit	Very difficult	2 organisations supplying farmers with inputs on loan
	Access to Inputs	Yes	yes
Access to External Markets	West Bank	Local market	No
	Israel	Yes	No
	Jordan	Yes	No
	Gulf States	Yes	No
	Rest of World	Yes	Yes

Current situation for herbs

Figure 5.23, below, shows the market map for the herbs sector in oPt.

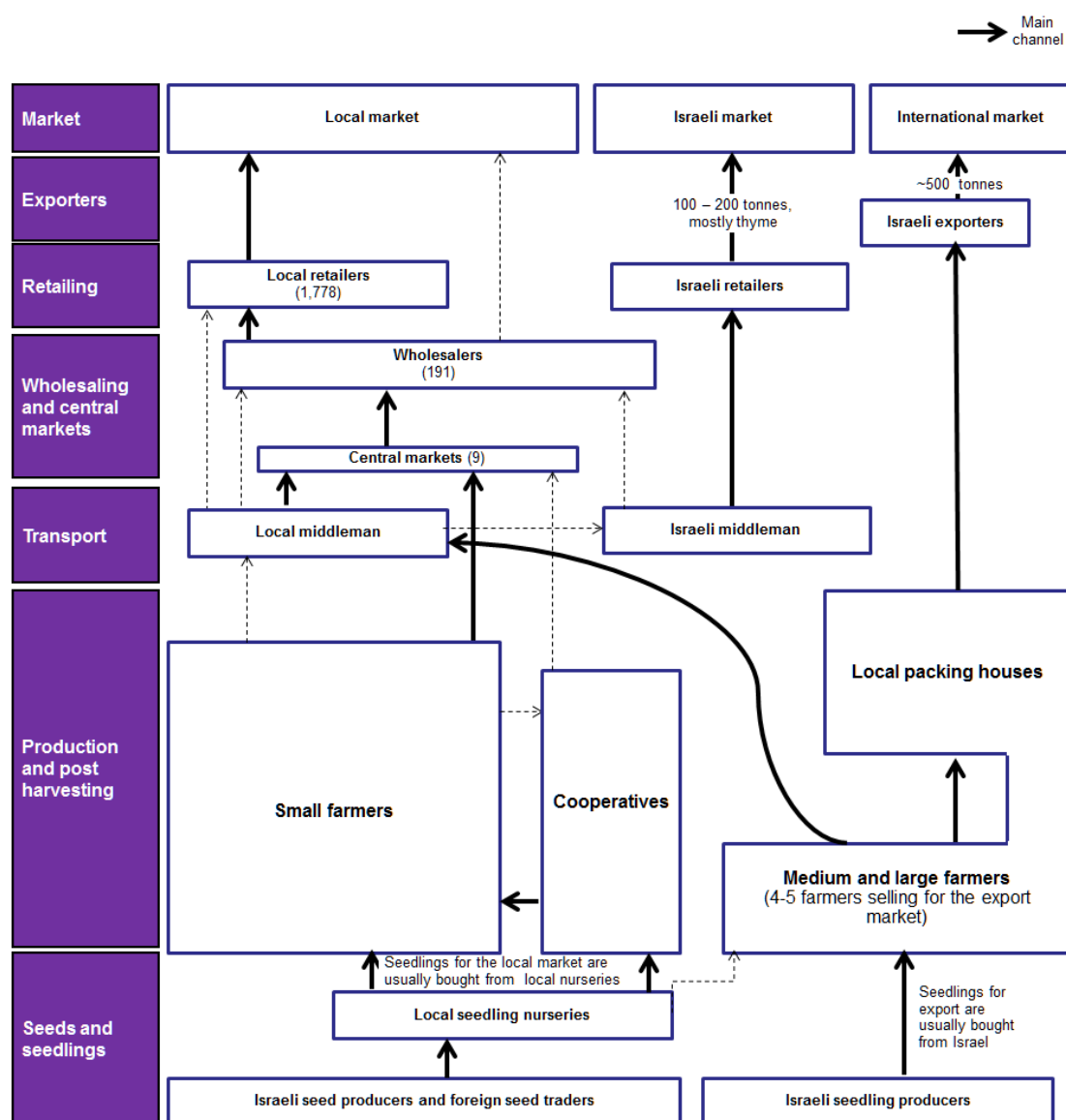


Figure 5.35 – Market map of the herbs sector in oPt

This study focused on herb production for the export market. As can be seen in Figure 5.23, this market channel is currently supplied by 4-5 medium and large farmers, usually vertically integrated further up into the value chain, and owning their own packing houses, which are currently operating below capacity (around 20%). These medium and large farmers have between 30 and 100 dunams of greenhouses for herb production.

Domestic market

Small farmers and cooperatives are focused almost entirely in supplying the local market, with some quantities also sold to Israel (including, in 2009, 110 tonnes of thyme, 20 tonnes of parsley, and 3 tonnes of mint). The linkages between small farmers or cooperatives and the packing houses are limited and sporadic.

The “Herbs and Organic Product Farmers’ Cooperative”, located in Jericho, is one example of a cooperative that established, but could not maintain, a link with a packing house. This cooperative was established in 1999 with 15 small farmers, and today is working with 50 small farmers (15 farmers joined in 2010), from the Jericho governorate. Thirty of the farmers are women. These small farmers have significant experience in herb production (the majority have been planting herbs for more than 15 years), and all of them adhere to organic production, which is a requirement to join the cooperative. The farmers mostly produce *zaatar* (*Origanum syriacum*) and mint, 70% of which in greenhouses. Most also produce other crops, such as banana and vegetables.

The board of the cooperative is 5 people, including 2 women. Farmers pay 10JD to join the cooperative, and then contribute periodically on a voluntary basis. The cooperative provides the following services to member farmers:

- Input purchasing, taking advantage of bigger purchasing volumes and a VAT exemption to achieve lower prices, and quality testing of those inputs. Sometimes, the cooperative also distributes free inputs to farmers, supplied by FAO;
- Agronomical skills training, performed by agriculture experts on farmers’ fields. Recently the cooperative has also performed field demonstrations on its own land, supported by a NGO. These demonstrations ran for three years, but have recently ceased due to lack of funds when the NGO programme finished;
- Strategic advice on the varieties of herbs to produce, according to the market demand and the characteristics of the climate and soil in the farmers’ areas;
- Support for access to finance. This support has thus far been limited to helping farmers engage with financial institutions. However, it is an area where the cooperative expects to improve its support in the near future by establishing a lending mechanism to its farmers;
- Product Marketing. This service has been very limited in its scope, as the farmers generally market their products on their own. In the past, the cooperative supplied small quantities of herbs to a local packing house for the export market. However, that relationship eventually failed, with the cooperative experiencing high losses due to a significant difference between type and quantity of the varieties it was producing, and what the packing house was interested in purchasing;

Export market

The most common fresh herbs produced for the export market are sweet basil, tarragon, chives, rosemary, mint, thyme, coriander, and parsley. The fact that most of these varieties of herbs are not attractive for the local market, helps to explain the clear division between the domestic and export market channels.

Exports are usually done through Israeli companies (mainly Arava and Agrexco), although there are cases where the Palestinian producers establish direct linkages with foreign clients, and export through Jordan. Major export destinations are USA, Russia, EU, Saudi Arabia, UAE, Kuwait, Jordan, and Yemen.

The export markets offer higher prices, and producers are reportedly able to achieve margins of 30% on average. Based on data collected on field visits, the margins for sweet basil production are 15%, as depicted in Figure 5.23.

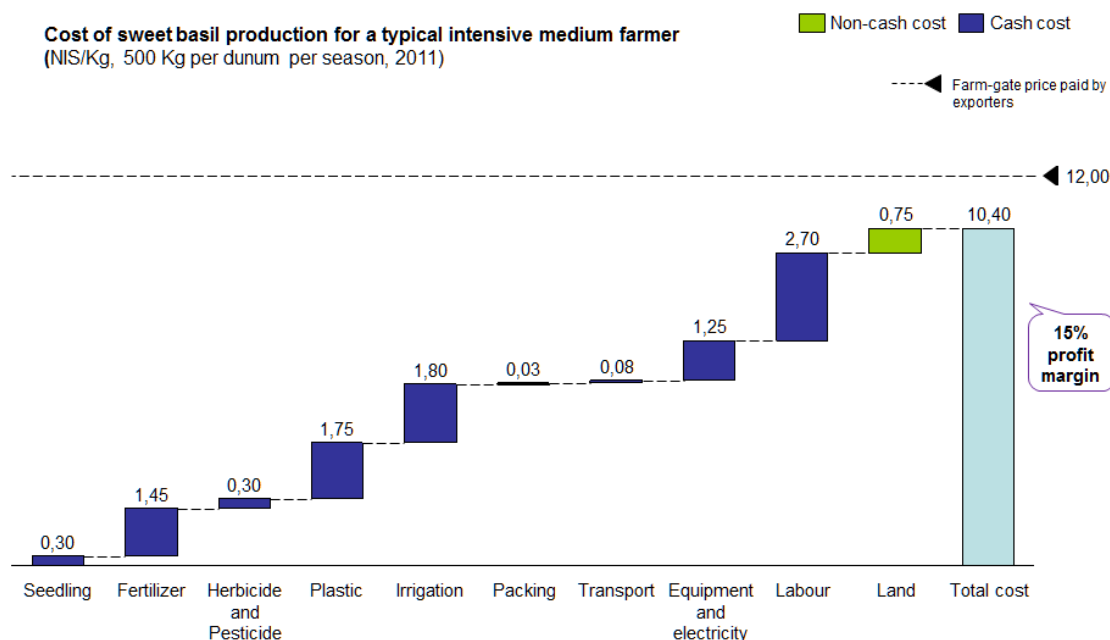


Figure 5.36 – Cost of production of sweet basil

The authors visited a farmer in the Jericho governorate who is exporting sweet basil to the USA. He started producing sweet basil this year, in 30 dunams of greenhouses, with 15 people (13 women) employed in the production and harvesting. He is considering expanding the range of products to include other export attractive herb varieties, such as tarragon, rosemary, and mint. This expansion would be supported by an increase in the area planted. The farm has its own packing house, a small building with one area of about 15 square metres for storage (usually herbs are stored for 1-2 days) and another area of about 25 square metres for quality control and packaging. The cooling system is provided by two air conditioners, of the same type traditionally found in domestic houses. Before the product is exported, the Ministry of Agriculture, through the extension service, inspects the products to guarantee its quality.

The general situation for fresh herbs, in terms of market linkages, production sophistication, environment, input supply, and the enabling environment is almost identical to that for fresh vegetables and so is not discussed further here. There are 10-30 herb seedling producers (nurseries) in the West Bank and Gaza. The domestic production of herb seedlings is not as common as the production of vegetable seedlings: there are no nurseries for the production of herb seedlings in Jericho, for example. While most of the seedlings for herbs destined to the local market are bought in the local nurseries, the producers of herbs for the export market buy most of their seedlings directly from Israel. A few large farmers with the required infrastructure in large plastic greenhouses have received more sophisticated production training from some Israeli experts on export herb production, as well receiving post-harvest and marketing from experts provided by the Moon Valley project, and have been able to achieve both GlobalGAP and BRC certification to the level required by UK supermarkets. However, fresh herb production to these high export standards is still lagging well behind the market demand identified by Moon Valley.

As with vegetables, there is no local herb seed production as it requires high technology equipment, adequate weather, lack of diseases, good varieties of plants to produce the seed, and isolation from agriculture production areas (to avoid genetic crossing). Therefore, the local nurseries import the seeds from international origins, usually through a middleman.

The farmers and nurseries visited reported that there is usually no shortage of seedlings and seeds in the market.

5.3 Bottlenecks and Opportunities within the Sub-sector

Bottlenecks

The oPt vegetable sub-sector is challenged with a number of bottlenecks which are preventing development of the vegetable industry. Figure 5.25, below, shows those bottlenecks that are constraining effective participation in the industry by poor smallholders and women.

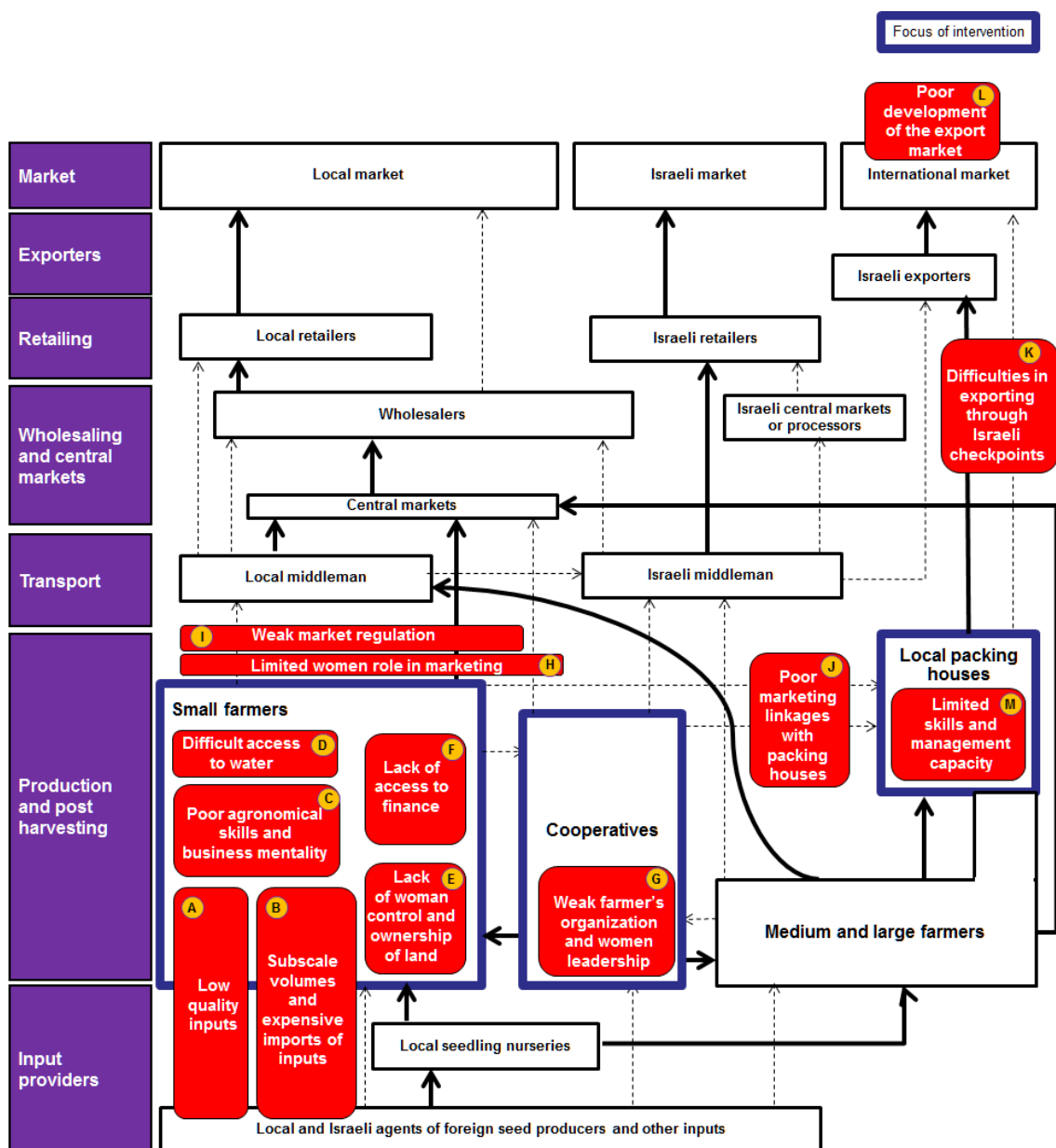


Figure 5.37 – Bottlenecks affecting the fresh vegetables sector

The bottlenecks fall into three distinct areas of the value chain: those affecting farms and the production base; those affecting market channels and the packhouses; and, those specifically affecting the export channel. Figure 5.26, below, gives an overview of these major bottlenecks, but

a more detailed appraisal is given in Appendix 4. The suffix letters in the figure below match those indicated in Figure 5.25

Value Chain Point Affected	Major Constraints	Comments
Farms and Production	Low quality inputs (A) Subscale purchasing volumes of inputs and expensive imports of inputs (B) Poor agronomical skills and business acuity (C) Difficult access to water (D) Lack of women's control and ownership of land (E) Lack of access to finance (F) Weak farmers' organisation and women leadership in cooperatives (G)	Cross-cutting & Vegetable specific Cross-cutting Cross-cutting Cross-cutting Cross-cutting Cross-cutting Cross-cutting
Market channels and packhouses	Limited women's role in marketing (H) Weak market regulation (I) Poor marketing linkages with packing houses (J) Limited skills and management capacity of local packing houses (M)	Cross-cutting Cross-cutting Vegetable specific Vegetable specific
Export Channel Specific Constraints	Difficulties in exporting through Israeli checkpoints (K) Poor development of the export market (L)	Cross-cutting Vegetable specific

Figure 5.38 – Overview of the major constraints in the vegetable and herbs value chains

5.4 Market opportunities for fresh vegetables

Opportunity to target the local market

The domestic market for vegetables has been growing in the last few years, but driven only by an increase in population (2.6% annual growth), as per capita consumption of vegetables has remained constant. Taking into account the official estimations that population will grow 2.4% a year during the next 5 years, and assuming per capita demand will continue following the same trend, it is expected that total tomatoes demand per year will increase by 28,000 tonnes in 2016 (to a total demand of 175,000 tonnes), cucumbers demand by 17,000 tonnes (to a total demand of 86,000 tonnes), eggplant demand by 4,000 tonnes (to a total demand of 36,000 tonnes), and peppers demand by 1,000 tonnes (to a total demand of 12,000 tonnes).

Most of the increased domestic demand is currently being met by increased local production channeled through the traditional wholesale, central market and retail channels. Therefore, the opportunity to address the increase in domestic demand volume for these crops appears to be relatively insignificant in a normal economic sense. What little import there is of vegetables from Israel and other countries in the region does not support a strategy of import substitution.

From a purely economic growth perspective, there appears to be limited opportunity for transformational change in Palestine's domestic vegetable sub-sector because on the surface it is difficult to identify sufficient economic return on the investments. However, from a pro-poor perspective it will be important to look at margin shares currently enjoyed by small farmers in the domestic market and to determine if there are opportunities to improve the efficiency of the market, even if they will not transform the industry in terms of total value. Similarly, inefficiencies further down the value chain, may be choking the income potential of the farmers if the price they received is a reflection of these inefficiencies and trade risks. However, the focus of much of this study was agreed early on to be primarily on the export market; more research is needed to fully understand the bottlenecks and opportunities affecting the domestic market.

The Palestinian domestic market has yet to see the kind of structural transformation already apparent in the Israeli market and certainly well-established in the EU and developed country markets, where supermarkets dominate fresh produce retailing. As urban centres in oPt continue their rapid growth in population and infrastructure, consumers will look for greater convenience in their shopping experience and that will almost certainly trigger investments in supermarkets. Thus, future market supply will need to be re-structured to meet larger volume transactions to major supermarket outlets, and small farmers will need to greatly improve organisational capacity around product aggregation, adoption of quality and product standards, and committed contract supply. In other words, there is not just a pro-poor reason for improving small farmer organisation and capacity, but in the medium to long-term the supply of fresh vegetables to urban populations will demand some considerable investment across the whole value chain if Palestinian farmers are to see genuine and sustainable economic improvement. The modernisation and improvement of the domestic market channels for fresh produce will first require detailed planning and the engagement of a full spectrum of both private sector and public sector resources to ensure that the resulting programme is properly integrated and in accordance with real consumer needs. The Palestinian government should seek donor support for such a major planning exercise and establish appropriate consultative structures to ensure that any further developments respond to the need of all market participants.

Opportunity to target the Israeli market

In terms of the opportunity to export to Israel, again the analysis focused on the selected crops: tomatoes, cucumber, pepper, eggplant, and squash. It is important to analyse the trends in domestic demand for these crops in Israel, as well as the trend in their production and export.

In 2009, annual consumption of tomatoes in Israel was 51.1 Kg per capita; this reflects a decrease of 0.9% a year since 2003. However, population has been increasing at 1.4% a year. Assuming these two trends continue, an increase in annual demand for tomatoes of 24,000 tonnes is estimated by 2016. Israeli production, at 455,000 tonnes in 2009, has been increasing by 1.6% a year since 2003, mainly to support an increase in the exports (8.3% a year since 2003), and to decrease the dependency on imports, which as a result have been decreasing by 16.3% a year since 2003, and are currently around 3,000-5,000 tonnes per year. Given that oPt currently sells 1,000-2,000 tonnes of tomatoes per year to Israel, there is an opportunity to triple this quantity. However, these volumes would be at a relatively low level (and wouldn't transform the industry), and oPt would have to

outperform the other suppliers of tomatoes to Israel, and, if the trend of Israeli import substitution continues, imports will be reduced even further during the next years.

The production of cherry tomatoes increased in the last decade, mainly because of an increase in exports. Despite the increase, production quantities are much smaller than those of regular tomatoes – about 40,000 tonnes in 2009. The majority of the production is exported, with domestic consumption accounting for about 15,000 tonnes per year. Despite a low opportunity to address unfulfilled demand of cherry tomatoes in the Israeli market, it is useful to understand whether oPt could be able to replace part of the Israeli domestic production with its own. While more detailed analysis is required to fully understand the potential for Palestinian peppers to be more competitive in the Israeli market, the difference between the average pepper price in Israel (7.06 NIS per Kg, according to (Finkelshtain, Kachel, & Rubin, 2011, p. 7)) and the export-quality production cost in oPt (5.18 NIS per Kg), seems insufficient to cover the significant transport costs of about 1-1.5 NIS per Kg. These transaction costs can be highly variable and could potentially be lowered - on the other hand, the nature of Israel's potential competitive response is not yet understood. More analysis would be required to establish a real opportunity here.

In terms of cucumber, in 2009 annual consumption in Israel was 19.5 Kg per capita, and it has been decreasing by 4.3% a year since 2003. Taking into account the estimated population growth of 1.4% a year, it is estimated a decrease of 25,000 tonnes in annual demand for cucumbers by 2016. Despite a growth in cucumber export from Israel (2.6% a year since 2003), the volumes are very small (2,000 tonnes in 2009). Therefore, there is no opportunity to increase current cucumber exports to Israel. Moreover, Israel has been decreasing its imports (by 1.7% a year since 2003) and production (by 3.3% a year since 2003) to adjust to this decrease in demand. This creates a risk for Palestinian exporters of cucumbers to Israel (which, with 30,000 tonnes per year, account for half of the exported volume of fresh vegetables to Israel), who may see that market opportunity close if they are not competitive against Israeli production.

Regarding peppers, in 2009 annual consumption in Israel was 14.4 Kg per capita, most of it of hot peppers. This demand has been increasing by 7.8% a year. With the additional increase in population, it is estimated that the annual demand for peppers in Israel will increase by 98,000 tonnes by 2016. In addition, exports (95,000 tonnes in 2009) have also been increasing significantly (7.4% a year since 2003). However, Israel is increasing its own production of peppers to address these increases in local and foreign demand, and as a result production has been increasing by 8.6% a year since 2003, with imports (currently around 3,000-4,000 tonnes) decreasing by 0.7% per year over this period. Therefore, it seems that domestic production will capture most of the opportunity created by an increase in demand, and that there is no significant opportunity to increase the current levels (2,500 tonnes) of export of peppers to Israel. While more detailed analysis needs to be done to fully understand the potential for Palestinian peppers to be more competitive in the Israeli market than Israeli peppers, the difference between the average pepper price in Israel (4.2 NIS per Kg, according to (Finkelshtain, Kachel, & Rubin, 2011, p. 8)) and the export-quality production cost in oPt (between 3.1 and 3.6 NIS per Kg, depending on the type of pepper), seems insufficient to cover transport costs of about 1-1.5 NIS per Kg. These transaction costs can be highly variable and could potentially be lowered - on the other hand, the nature of Israel's potential competitive response is not yet understood. More analysis would be required to establish a real opportunity here.

Data for eggplant and squash was not available. However, it is expected that these two crops are following the same trend as the general vegetables: stagnant per capita consumption, and a modest increase in total demand driven by population growth. Given that these vegetables are not significantly consumed by Israelis, nor do they belong to the main crops currently traded from oPt to Israel, there seems to be no major opportunity to target their export to Israel.

The recurring pattern of the Fallow Year in Israel has been directly mirrored in Palestine by considerable price increases in the domestic market and greatly disadvantages Palestinian consumers. The severity of the price increases also suggests that Palestinian farmers are not adequately planning their production to meet the increased Israeli demand and are probably not gaining economically from the opportunity as much as they could be.

Opportunity to target the international market

In terms of other international markets, to which oPt currently exports 5,000-10,000 tonnes per year, and based on the analysis of section 2.2 c), there is an attractive market opportunity to increase off-season exports to high-quality export markets. France, and Netherlands are attractive markets, and Netherlands has already a proven track record of importing from Gaza, where export oriented infrastructure exists and farmers have the knowledge regarding the export procedures. Figure 5.22, below, looks specifically at the export opportunity for oPt cherry tomatoes entering the EU markets.

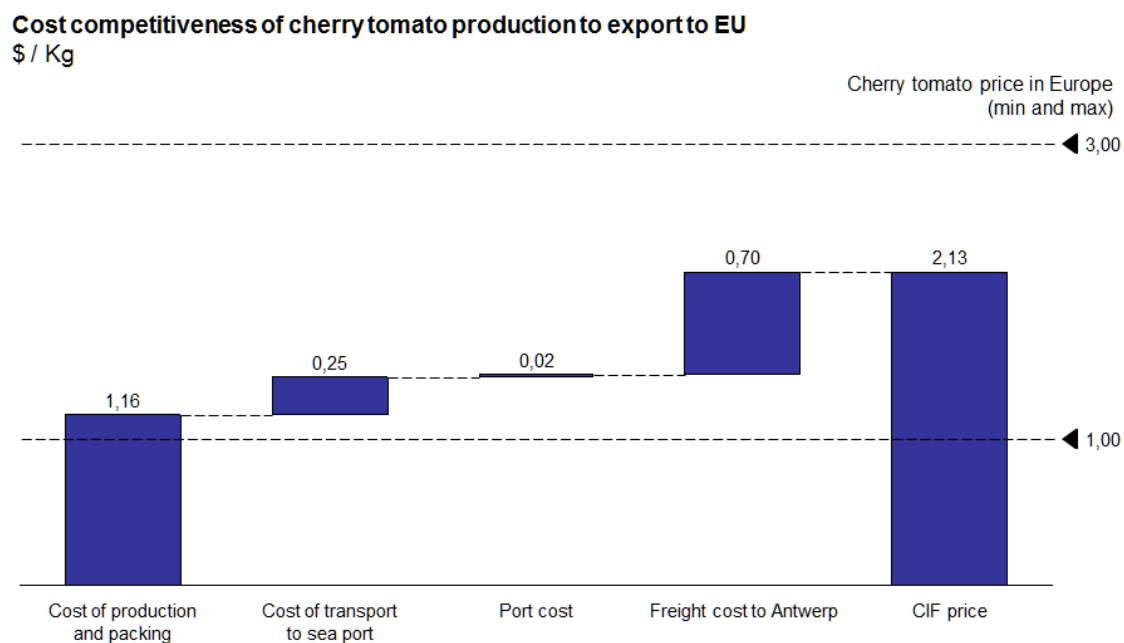


Figure 5.39 – Cost competitiveness of cherry tomato production to export to EU

However, the most significant export opportunity is seen as the medium-quality counter-seasonal export markets of Bulgaria and Russia (where importers are looking for larger volumes of good quality vegetable products to the level of GlobalGAP, but without the more costly and exacting standards demanded by supermarkets in the EU). Similarly, some of the rapidly expanding central Asian markets such as Kazakhstan are also looking for large volumes of competitively-priced products to GlobalGAP standard but no higher. In the Gulf, where there is already strong moral and economic support for the oPt, the most attractive markets are Saudi Arabia, UAE, and Qatar, although exports will have to be competitive in terms of quality and price to gain market share from Jordan, Syria and Egypt. It is expected that oPt fresh vegetable producers could increase the current level of exports by around 50% during the next 5 years, from the current 80,000 tonnes, to 120,000 tonnes.

There is potential to integrate smallholders and women in fresh vegetable production for the export market. For that to happen, small farmers need to be supported to organise themselves better by

joining existing groups or forming new groups, to be capable of overcoming the bottlenecks that hinder their participation in the export market.

5.5 Market opportunities for fresh herbs

Despite the higher quality requirements needed to serve the export market, there are **examples of successful exports of fresh herbs from oPt**:

- **Sinokrot**, the biggest exporter of herbs in oPt, is currently exporting to Europe, Russia, and the Gulf region
- **Moon Valley** has been arranging imports of herbs to the Western European market, mainly drawing on Sinokrot, although they are diversifying their sourcing
- A **large Palestinian farmer** is currently exporting sweet basil to the US market

These exports have demonstrated the potential of Palestinian herb exports, but to date that potential remains substantially unrealised. In 2010, Sinokrot was present at Fruit Logistica, one of the largest fresh produce trade shows in the world, with more than 2,300 exhibitors from 71 countries. In this fair, The Sinokrot Group, representing PalGardens, Khaizaran Herb Farm, and Moon Valley Dates, hosted a booth displaying fresh herbs, tomatoes, sweet peppers and medjool dates. During the three day show, Sinokrot received interest from more than 35 companies requesting a variety of different produce items. Companies expressed an interest in buying a total of 19 tonnes of fresh herbs per week (almost three times Sinokrot's current export of 7 tonnes per week).

Similar to the earlier discussion on fresh vegetables, it is important to distinguish two different international markets for herbs: the high quality export markets of the US and Western Europe, and the medium quality export markets of Eastern Europe and central Asia.

High quality export market

Since western European countries do not have suitable agro-climatic conditions to cultivate most herbs, they depend heavily on imports from countries with moderate or semi-tropical climates. Spain, Germany, UK, and the Netherlands are the major importers in western Europe, as depicted in Figure 5.23. These countries import the majority of their fresh herbs from developing countries.

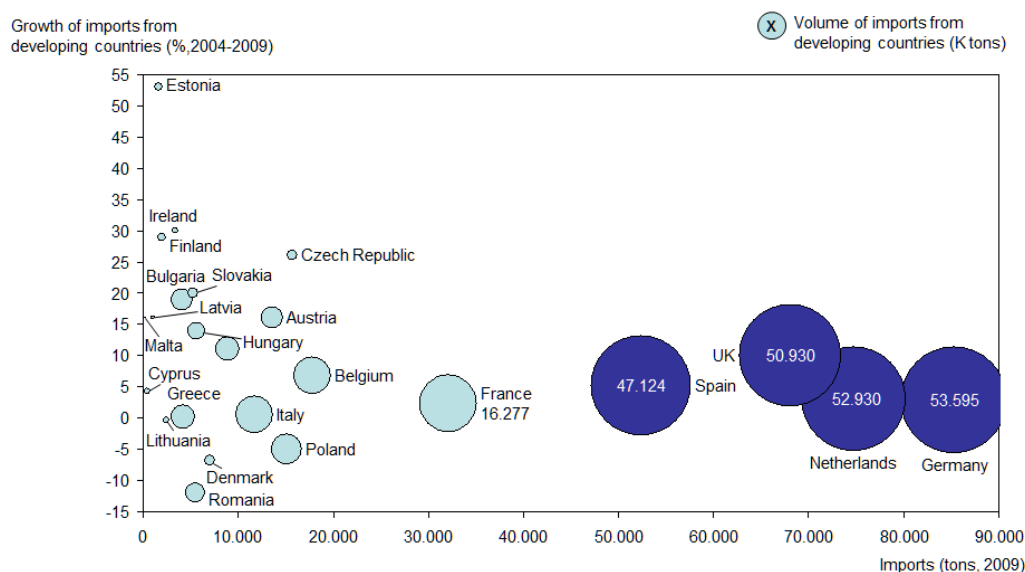


Figure 5.40 – Imports of herbs from the EU

The fresh herb market in the UK has grown significantly in recent years and is now believed to be worth around £90 million per annum. The production between June and October is mostly local, and the country imports primarily from November to May from an increasing number of sources, including Spain, Portugal, Morocco, Egypt, Turkey, Cyprus, Kenya, Ethiopia, Israel, and oPt.

However, and similar to what happens in fresh vegetables, high quality and food safety standards must be met to access western European markets, with access made more difficult due to the concentration of supply chains. Appendix 3 gives a more detailed account of the key features of EU markets pertaining to fresh produce export from oPt.

The USA has reportedly less stringent certification requirements than Western Europe.

Medium quality export market

Russia, Ukraine, Bulgaria, Saudi Arabia, and UAE are major importers, although volumes are currently lower than Western Europe and USA, and reportedly represent good opportunities.

5.6 Recommendations

The study's recommendations address two different areas of focus, firstly resolution of cross-cutting challenges that affect the whole agriculture sector but are important to the vegetable and herb sub-sectors, and secondly, resolution of some challenges highly specific to these sub-sectors.

Cross-cutting recommendations

The study has identified the following cross-cutting needs which have relevance across the whole agriculture sector, as well as being important to the development of the vegetable sub-sector in oPt:

- Improved access to water
- Improved extension services and training
- Improved agriculture related information
- Improved farmers' and traders' organisation
- Improved access to finance for all stakeholders

- Strengthened market regulations
- Improved access to market and input supply information
- Improved and modernise the domestic market channels

The cross-cutting recommendations relevant to these are discussed in the “Cross-cutting Recommendations” chapter, below.

Given the recommendations for the herb sub-sector are very similar to those for the vegetables sector (especially around the needs to link existing and new exporters to small-scale producers), and that improvements are likely to be realised among vegetables more quickly, the study did not spend as much time focused on developing a strategy for the herbs sector. However, it is recommended that fresh herbs be included in any developmental initiatives for vegetables.

For the vegetables sector especially, improvements in these cross-cutting areas will be of benefit to those farmers seeking improvements in local market access and performance, and will help prepare them for subsequent access competitive access to the export markets.

Improved access to good quality water for irrigation is always a priority for fresh vegetable and herb production because it directly impacts productivity and quality. In terms of the specifics for the training of fresh vegetables farmers, Figure 5.24 shows an example of the main topics covered by a typical agronomic-focused training programme oriented to increase plant crop productivity.

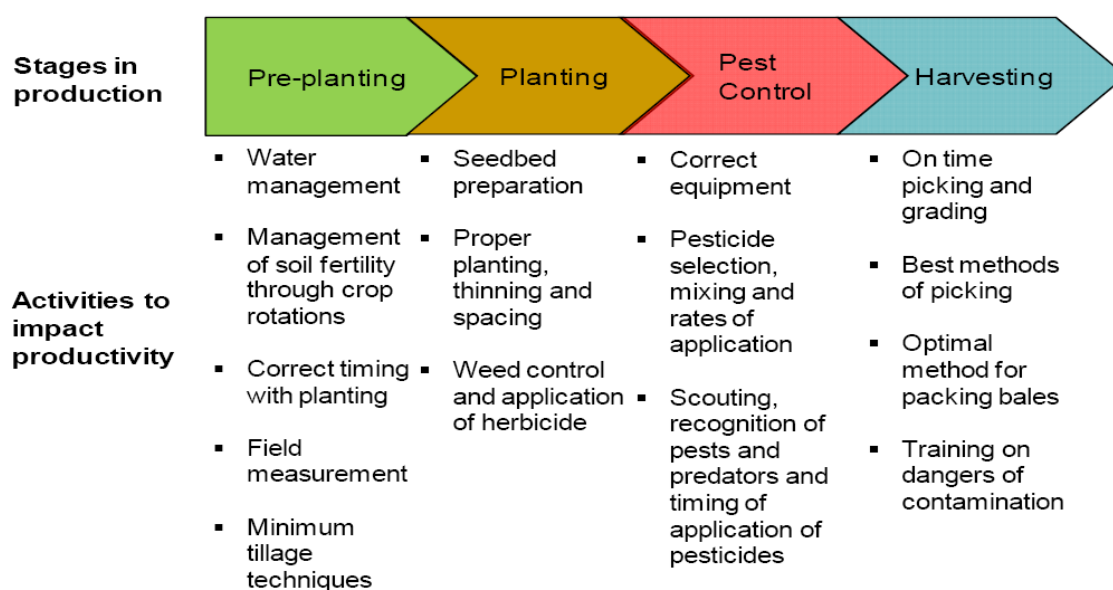


Figure 5.41 – Main topics covered by a plant crop production training programme

A key recommendation is to ensure that smaller farmers can access inputs and finance more cost effectively, as well as to present themselves to the packhouses in an aggregated way to capture economies of scale. In this regard it is important to consider how improvements in the local market, as the wholesalers grow and supermarkets start to flourish, can help farmers gain from economies of scale in this market as well. One possible evolution would be for the producers to invest in trucks to enable them to link directly to wholesale markets, ensuring a greater share of value gets captured on farm.

To realise these scale economies farmers need to organise themselves, or transform their cooperatives, into more effective business groupings. These farmers’ organisations need to be

trained and commit to improved governance and transparency to reassure buyers that the supply base is well-managed and can consistently deliver better quality produce. This will be especially beneficial for the export market.

Better farmer organisations, product variety and quality improvement, as well as improved access to water, finance and inputs will be a priority to improve export penetration by the smaller farmers through linkages with the export players. As an alternative to sourcing from medium and large-scale producers, and internal vertical integration, exporters will need to be incentivised and supported to partner and pilot outreach and extension efforts with smallholder organisations. While the exporters will benefit from increased utilisation of their pack-house capacity and margins, they will also incur significant additional costs early in the process when they are still uncertain about the outcome. The terms of such partnerships between exporters and programme promoters will require hard-headed negotiation. The ability of a prospective programme of support to offer expanded market access would give it significant leverage in such discussions with lead firms.

Any support programme for the vegetable value chain should establish an incentivised competitive process to screen and select existing cooperatives for upgrading. A package of incentives should be designed to attract high-capacity cooperatives to participate. Such a package could include subsidised improved seedlings and inputs for the first year together with partial grants and credit guarantees that would enable the cooperatives to expand their greenhouses, install water systems (see above), and construct small-scale primary processing facilities. It might also include some volume/price guarantees. With a focus on farmer organisation governance, management and sustainability, it would be important to ensure that the farmers have to perform a sequence of activities, including governance reviews and improvements, technical, financial literacy and business skill training programmes, as well as investing some of their own resources, in a carefully sequence linked to their plans, in order to access the full support package.

Farmers will need to invest and raise finance for greenhouses, improved irrigation equipment, and other production inputs. It is recommended that these small farmer investments should be partially subsidised, for a specified catalytic period only, to offset the risk and to encourage some momentum for change in the industry, while ensuring that farmers do actually pay something (and not less than what they are paying now). We anticipate that over a three year period the subsidised farmers should be able to take over full payments of working and investment capital costs. In view of the currently restricted opportunities for packaging, a greater number of serious investors in packing and processing businesses is needed, investors who are prepared to engage with the small farmers in a more transparent and committed manner. As with the small farmers, these investors should not be grant-funded, although some form of soft financing might be required.

In parallel with improvements in farmers' organisation, it will be equally important to encourage the traders to improve their organisations, especially the wholesalers who drive the bulk of the trade, and to improve their management skills. Improvements in trader organisation are needed to provide a more effective framework for introduction of improved market and fresh produce standards. At present, wholesalers operate in an independent and individualistic way and many lack the business skills necessary to manage, and more importantly improve their operations. More efficient transactions down the value chain will mean more opportunity for the producers. We could not find evidence of a fresh produce wholesalers association, and clearly such a membership-based organisation (MBO) is needed if the industry is to move forward in an integrated way.

The main focus of this study was on the expansion of the export channels for Palestinian produce, with a deliberate bias on improving the access of small-scale vegetable farmers to these channels. In the latter part of the study it became apparent that urbanisation has increased so rapidly in Palestine that there is a strong need to modernise and improve the domestic market channels for fresh produce, not only to ensure a sustainable supply for urban consumers (that now constitute almost

70% of the population), but also to create an appropriate foundation for driving fresh produce exports in future.

Accordingly the authors recommend that any future interventions include a more detailed assessment of how improving dynamics within the domestic fresh produce market in oPt can help to drive modernisation and improvement across the whole value chain and prepare the smaller farmers to be more successful in the export market chain. One of the key issues to be tackled would be to obtain a deeper understanding of the role of the traders and middlemen and understand options facing them if wholesalers start to form direct links to farmer organisations. Such a study will require a multi-disciplinary and multi-institutional approach that incorporates the private sector expertise of commercial practitioners in modern fresh produce distribution together with the relevant public sector institutional capacity residing in the ministries of Agriculture, Trade and Finance, as well as the municipal authorities who are responsible for urban planning. Consumer consultation should be an important aspect of this exercise. It is recommended that the first step be the creation of a fresh produce industry committee composed of representatives from all the relevant stakeholders in both private and public sectors, and that this committee would then provide the required advisory capacity to the study team.

Different cohorts of farmers have different opportunities and needs

Not all farmers and farmer organisations are the same in terms of their sophistication and technical and business acumen, and in terms of their developmental needs. We see that there are three distinct cohorts of farmer groups and organisations:

Level I - More sophisticated farmers, possibly already attempting export production to the EU and other major markets.

Level II - Relatively well-organised farmers who are not yet growing to export standards but regular suppliers of better quality produce to the domestic and Israeli markets and who have the capacity to up their game and start supplying more sophisticated extra-regional markets.

Level III - Much less sophisticated farmers, many of whom may be landless and working on a share-cropping basis, for whom much can still be done to improve the margins of supply into the domestic market and Israeli market.

We recommend that development support to these different cohorts be deliberately structured and phased so that their aspirations and needs are more closely matched by the nature of the support given and that economic targets reflect their true capacity and capability. Nonetheless, we firmly believe that significant improvements in economic performance are possible for all three levels. For all three cohorts, it is recommended that development efforts should start with “lead” farmers who are prepared to invest time and money to move up the quality and productivity curve, and so provide a positive message to all small farmers that there is a significant return on investment.

5.7 Recommendations specific to the vegetable sub-sector

The study has identified the following three recommendations specific to fresh vegetables:

- Improve export market channels and increase exports
- Increase quality of inputs
- Reduce dependency on imported inputs

The other recommendations are covered in the cross-cutting sections below.

5.7.1 Improve export market channels and increase exports

Description of activities

To improve the export market channels and increase the current levels of fresh vegetables exports, in particular those that are produced by and sourced from small scale farmers, interventions should target three areas:

- Promote Palestinian fresh vegetables in the export market, especially Western Europe and the Gulf region. This can be achieved by:
 - Continuing to have Palestinian participation in fresh vegetables specialised exhibitions and other food shows that promote the targeted market destinations. Leading private players should have to pay their own way to participate, but they can be offered subsidised support to the extent they ensure that the small farmer supplier story is featured more strongly, and their commitment to that source of supply. They should be incentivised to take along leaders of producer cooperatives to assist in their education about expected qualities and standards, as well as to have a better understanding of their competition
 - Joint Ministry and private sector trade missions to targeted export market countries for the promotion of Palestinian products
 - Strengthen Palestine as an origin and incentivise the leading exporters in partnership with PalTrade, and the Ministry of National Economy (responsible for trade and industry) to develop a strong “Palestine Fresh” produce brand and associated promotional materials. Such a brand can be used as a quality assurance tool in the future. Only fresh produce that meets leading export market specifications would be able to use the brand label. This would require the development of capacity to manage such a brand, but repay the investment through the development of brand equity.
 - Create a marketing and communication channel for promoting and advertising Palestinian products abroad (including the promotion of an active involvement of the Palestinian embassies’ commercial attaches). Particular emphasis should be placed on linking the use of Palestinian products to committed overseas food manufacturers, caterers and restaurateurs such as Ottolenghi.¹³
- Create new, and strengthen existing, partnership agreements, at two levels:
 - Country level, between oPt and other promising countries, for instance through the establishment of trade agreements specific to fresh vegetables, and the enforcement of existing ones between oPt and Arab countries (there is an Arab free trade area that includes the Gulf region) and EU (oPt is allowed to export products to EU without any tariffs at all times of the year)
 - Private sector level, between domestic producers and foreign buyers and export partners (such as already developed with Moon Valley). Given the dominant presence of Israeli export companies (three of them) in the oPt market, facilitating the establishment of a greater number of Palestinian exporting companies can bring benefits in terms of increased competition and demand for the Palestinian production. This should lead to improved farmers’ margins over time. This is

¹³ Moon Valley has been developing linkages with Ottolenghi to use his recipes to promote Palestinian ingredients. For example of his recent cookbooks see http://www.amazon.co.uk/Plenty-Yotam-Ottolenghi/dp/0091933684/ref=sr_1_1?s=books&ie=UTF8&qid=1315266723&sr=1-1

another area where a “challenge fund” type of approach can assist. Invitations should be issued to potential investors and other non-state actors to develop such companies to enter the market with a stipulation that they commit to sourcing from smaller farmers. The subsidy level and length of availability of matching grant funds would be tied to the investments required to ensure the smaller farmers are able to climb the learning curve as suppliers to the exporting companies.

- Ease the transaction costs associated with exporting
 - The Palestinian Authority should be supported with legal and technical assistance to continue to improve the business rationale for both Israeli and Palestinian interests, notably focusing on: improved ease of navigation through checkpoints; increased transparency and predictability of crossings to the Israeli markets and export markets through Israel and through Jordan

Key actors

The Ministry of National Economy should play an overall leadership role in the implementation of these recommendations. The administration of the competitive grant funds to encourage more entrants should be managed by an independent entity with good governance and transparency to ensure fair and equitable engagement with the private sector players.

On the donor front, USAID, CIDA and UNDP have been working on these issues.

Risk

There is a low risk of failure in the implementation of this recommendation.

5.7.2 Improve quality of inputs

Description of activities

Besides the common recommendations of improving farmer’s training on input use, there are two activities that are particularly important for the specific case of the fresh vegetables sector:

- Advocacy for access to imports of key fertilisers for agriculture production
 - Identify specific businesses where improved access to the prohibited fertilisers would be crucial, and develop strong business and social cases as to why it is necessary and who it will benefit
 - Involve the Office of the Quartet Representative on advocating the above topics on behalf of the Palestinians
- Certify and control labels of input products, mainly chemicals used as inputs, including translating them to Arabic

Key actors

A range of local actors supported by international consultants and specialists should lead the advocacy for access to imports of key fertilisers. The PNA should take the lead in implementing the certification and control of labels of input products.

Risk

There is a medium risk of failure in the implementation of this recommendation given the nature of the constraints.

5.7.3 Reduce dependency on imported inputs

Description of activities

The following activities have the potential to mitigate the dependency on imported inputs. The recommendations neatly divide into two groups. The first group address specific skills that need to be included in the improved extension and training services to be provided to the vegetable farmers. Given that multiple players may be involved, knowledge of the suitable techniques and training will need to be made widely visible and accessible.

- Promote and train the farmers in the use of solar sterilisation of soil to decrease herbicide and pesticide use
- Provide training on which types of inputs, and when and how much inputs to use to optimise production
- Provide training to support farmers to increase the production, quality, availability and use of compost and manure

The second group of recommendations requires changes in stakeholder roles. Various mechanisms can be used to stimulate the desired changes and behaviors. A competitive grant process could be used to identify local actors that wish to take a leading role in developing the response without carrying the full risk. The two areas are:

- Establish commercial service providers to perform some activities traditionally undertaken by farmers themselves, but mostly neglected due to lack of skill and poor affordability. These “contract” services could be provided by private operators or cooperatives and might include spraying and mechanical land preparation. The rationale for the shift in role would be to optimise service effectiveness and delivered cost.
- Commercial scale production of high-quality compost as fertiliser

Key actors

The Ministry of Agriculture should lead the development of targeted extension and training activities in the first instance. At the same time, incentives should be offered through challenge fund type facilities to incentivise the private sector (eg input suppliers) and/or farmer organisations to take on these roles if possible.

Risk

There is a low to medium risk of failure in the implementation of this recommendation.

5.8 Potential Impact of the Recommendations

We can summarise the recommendations including the cross-cutting recommendations in the following figure:

#	Recommendation	Key Actors	Timing	Co-dependencies	Risk of failure
1	Improve access to finance (see 10.6a) + Improve access to water (see 10.6b) + Improve extension services and training (see 10.7a) + Improve farmer organisation (see 10.7b) + Improve market channels and increase exports (see 10.8a)	Exporters, NGOs PNA + Palestinian Water Authority Exporters, Service providers Min. Agriculture + NGOs Min. Labour + NGOs Ministry of National Economy	Short term	-	Medium
2	Strengthen market regulations (see 10.6c)	PNA + PSI	Short term	-	Medium
3	Improve access to markets and inputs information (see 10.6d)	Farmer Orgs, NGOs, Telecom	Medium term	Improve farmer organisation + Improve agriculture information	Low
4	Improve agriculture information (see 10.7c) ¹⁴	PCBS, local market authorities	Medium term	-	Low
5	Increase quality of inputs (see 10.8b)	MinsAgr & National Economy	Short term	-	Low
6	Reduce dependency on imported inputs (see 10.8c)	Input suppliers, Min Agr	Short term	-	Low
7	Modernise and improve domestic market channels	All stakeholders in the value chain, including both private and public sectors and consumer and municipal authorities.	Long term		

Figure 5.42 – Overview of the recommendations for the fresh vegetables and herbs sub-sectors

¹⁴ This intervention will facilitate the implementation of activity #3, but it was not considered in the impact calculations

Projected vegetable product specific impact of the recommendations

As an illustration of the potential impact of the combined cross-cutting and vegetable-specific recommendations, Figures 5.25 – 5.27, show the model-driven hypothesis-based projected impacts, on the cherry tomato, sweet pepper and hot pepper value chains (for the export market). The numbers on the bottom axis of the figures below relate to the adoption of the various groups of recommendations portrayed in figure 5.30 above.

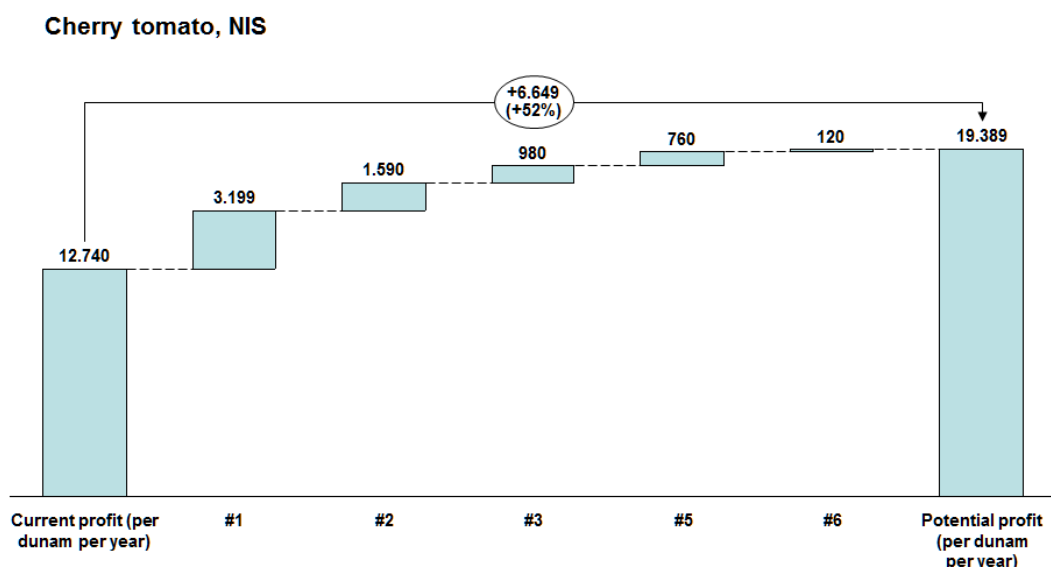


Figure 5.43 – Impact on the cherry tomatoes value chain (for export)

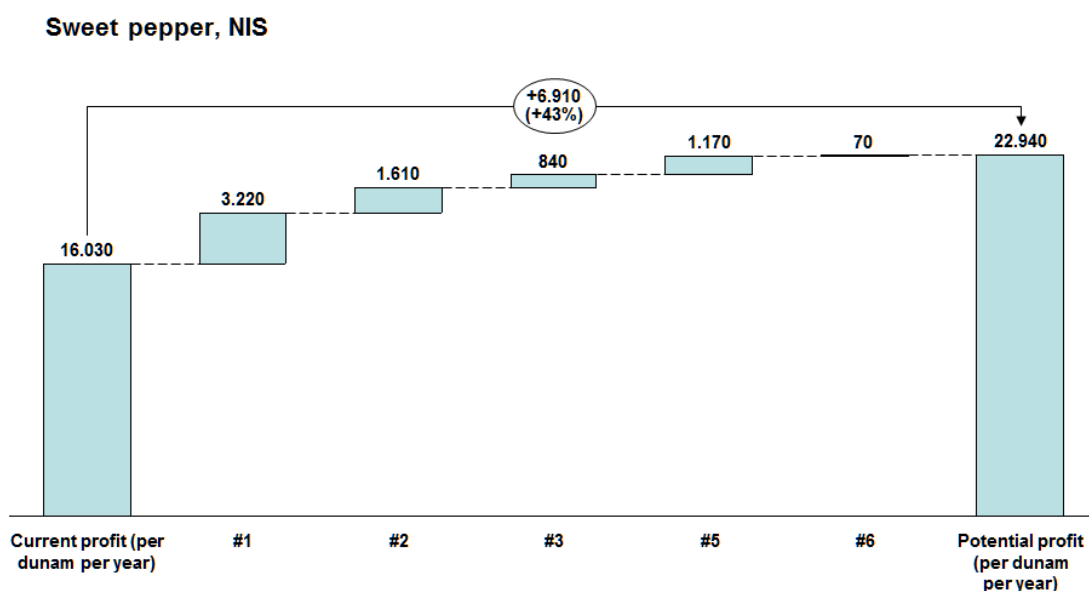


Figure 5.44 – Impact on the sweet pepper value chain (for export)

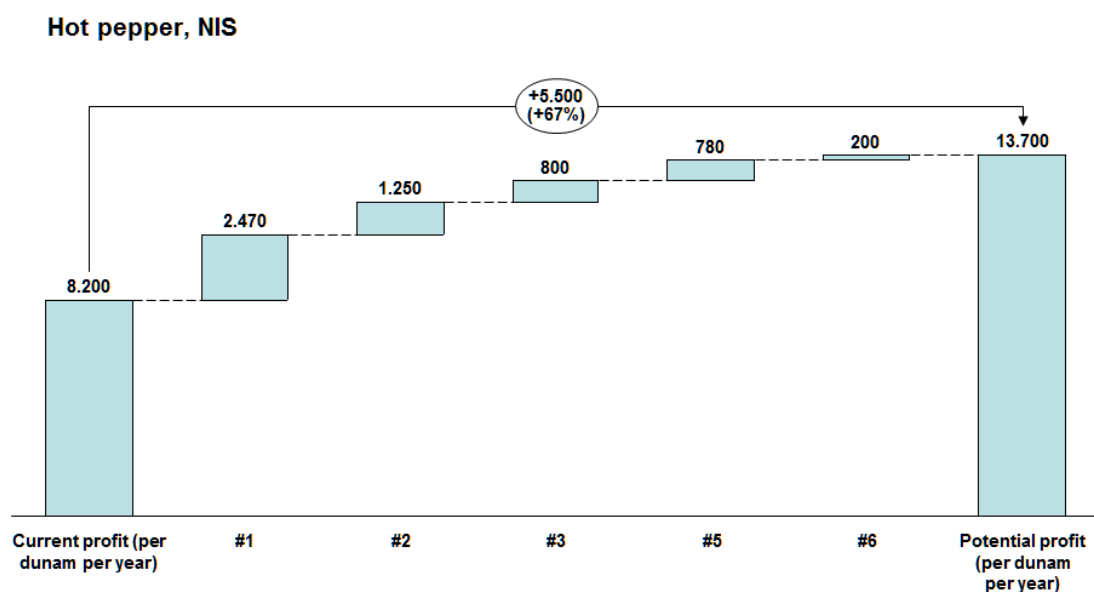


Figure 5.45 – Impact on the hot pepper value chain (for export)

5.9 Overall projected impact on the vegetable sub-sector

The study recommendations are deliberately holistic in nature and cover a wide array of remedial market-based measures for the vegetable sub-sector and the agriculture sector as a whole. Provided these measures are able to be accomplished, the study analysis projects that the included recommendations have the potential to increase the value of marketed production in the sector by a cumulative \$30.4 million over the next 5 years. To illustrate the household-level impacts of such an increase, if achieved these increases have the potential to benefit 4,000 vegetable farmers by an average of \$2,600 per family per annum in the fifth year. These impacts are merely illustrative. The desired consequence of adoption of the recommendations would be the transformation of the sector over time into a rapidly growing sector based on increasing inclusion of small farmers in the export supply chain. Its impact would be much larger into the future.

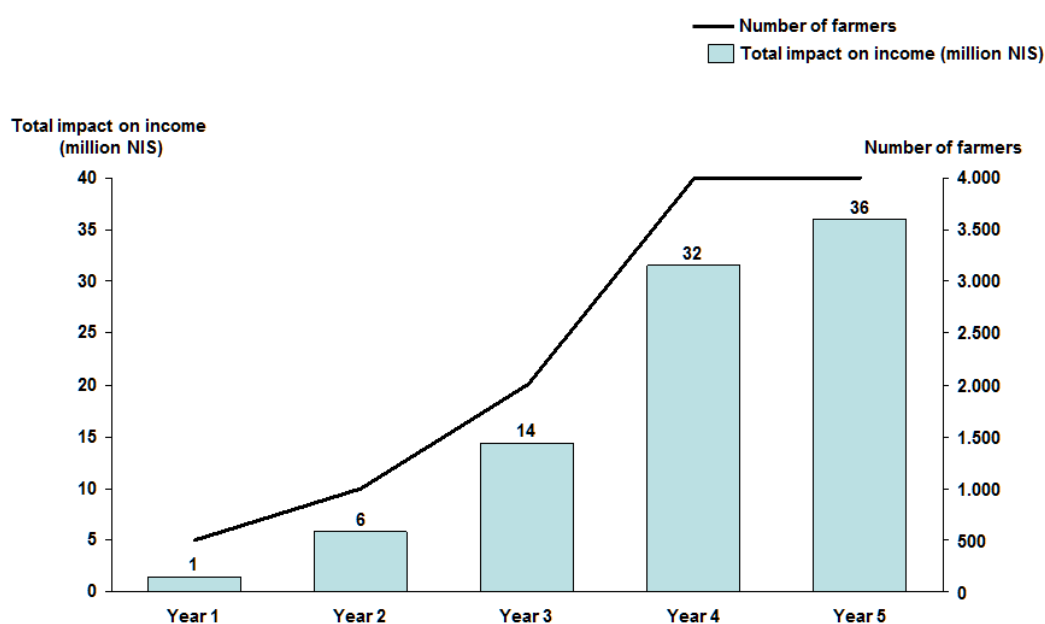


Figure 5.46 – Impact on fresh vegetables

6. Dairy Sub-sector

6.1 Executive Summary – Dairy Cattle

The dairy cattle sub-sector in oPt is seen as attractive for 3 main reasons:

- It serves primarily a local market with growing demand
- There is already a trend in place for industrial processors to switch from imported to domestically produced raw milk
- There is also a small but established export trade to Israel that can be expanded

Current Conditions

Milk from dairy cattle accounts for 55% of the estimated 170,000 tonnes of total milk produced annually in the oPt (PCBS). There are two fairly distinct value chains and markets in this sector: traditional and industrial. The traditional one includes small and medium cattle herders throughout the West Bank and Gaza that sell primarily to local consumers of raw fresh milk and traditional processors with small-scale artisanal family enterprises. Of the total of 95,000 tonnes of cow milk produced and sold annually, around 55,000 is absorbed by this market. Its counterpart, the industrial market, is comprised of 10 processing plants and almost 100 large farmers. It absorbs 40,000 tonnes of raw cow milk per year, and transforms it into value-added products. About half is sold as pasteurised milk, the other half as higher value dairy products.

The number of cows in oPt has remained relatively constant since 2004, at about 19,000 - 20,000. However, there is a clear trend of a reduction in the number of animals in Gaza due to a decrease in the attractiveness of the prevalent extensive model of production. On the other hand, the number of animals in West Bank has been increasing, mainly to support the local processing industry, which has been becoming increasingly vertically integrated. In recent years this industry has significantly shifted from using imported raw milk to using domestically produced raw milk, apparently in response to growing demand pulling through increased local supply.

Total domestic demand is reported as 189,000 tonnes of milk-equivalent in dairy products per year, most of it consumed in the form of cheese, yogurt, and liquid milk. While demand for fresh and pasteurised milk seems flat, demand for yogurt, cheese, and *labneh* is growing, which has been driving an increase of imported products (currently at 22,000 tonnes of milk equivalent, valued at \$25-45 million), mainly from Israel.

This trend of increasing demand is expected to continue, as oPt per capita consumption of dairy products remains well below the average of neighboring Arab countries. Although more research is needed regarding the quality and price competitiveness of oPt against Israeli imports, in terms of retail prices oPt seems able to compete against imports on cheese and yogurt production.

Key Constraints

The major constraint facing small and medium farmers is their weak linkages with industrial processors. Without significant interventions to change the market dynamics, the large players have little incentive to source from smaller farmers and the current trend of greater vertical integration will continue to further marginalise the smaller farmers. Changing the incentives

for the large processors requires two inter-related changes: 1) adoption of on-farm practises that improve productivity and milk quality, and 2) prompt bulking and chilling of milk to volumes (and quality) of commercial interest to processors. Improved access to markets, and to services, will prove a powerful organizing principal to encourage smallholders to join and invest in producer groups able to achieve volumes of good quality chilled milk. Expanded local sourcing will allow Palestinian commercial processors to reap economies of scale by improving their capacity utilisation from current levels of around 45% and enable them to compete against imports for the growing local market, thus creating a virtual cycle that pulls through increasing volumes of milk from the small farmers. Increasing the respective transparency of the farmers and processors businesses will build trust and support the creation of durable market linkages.

Key Recommendations

Build incentives for local processors to link to and support farmer groups in order to take advantage of lower cost supply and import substitution opportunities. Work with local processors and stakeholders to support the organisation of farmers into producer groups of around 30 farmers each; and in turn support and build incentives for these groups to aggregate into milk collection centres that bring together 8-12 producer groups into an umbrella business unit comprising around 350 farmers – able to supply 6,000 – 9,000 litres of milk daily. Once a business case is proven for such groups, the farmers would be naturally incentivised to support the formation of these larger marketing units to achieve economies of scale and efficiencies in accessing inputs, finance, animal health and other needed services. The processors in turn would be able to manage their procurement more easily from these larger, better managed and more efficient units.

Potential Impact

Our projections, based on certain assumptions about the potential scale of any new interventions, indicate that the above recommendations have the potential to increase the value of marketed production in the sector by a cumulative \$8.8 million over the next 5 years. To illustrate this impact, if achieved, these increases have the potential to benefit 750 small-scale dairy farmers by an average of \$2,900 per family per annum in the fifth year. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

Dairy products from oPt sold to East Jerusalem, have increased from \$6-\$7 million in 2007, to the current level of \$11 million. This has happened in spite of efforts from Israel to reduce its level of dairy imports overall, which have decreased by half in the last five years. Thus, it appears hopeful that further improvements in dairy competitiveness by oPt processors will be enable them to achieve further increases in exports to the Israeli market.

With improvements in herd productivity and cooperative action, along with improved raw milk quality, there will also be scope for improving women's artisanal processing, product packaging, food safety and marketing. These improvements, which arguably will be more important to the processing of sheep and goats milk, will open further opportunities for smallholder households to increase their incomes.

6.2 Introduction

As depicted in the figure below, data from 2008 listed the number of oPt cattle as including some 19,400 cows, As would be expected, the large majority of these animals are in the West Bank.

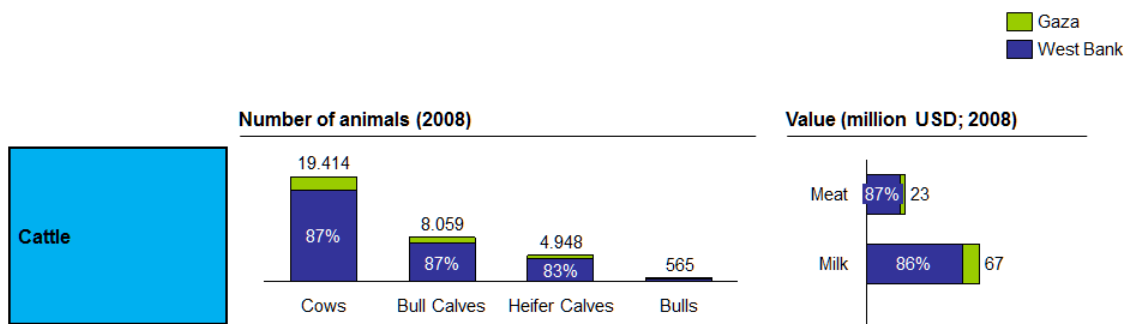


Figure 6.1 – Dairy Cattle animal numbers and value, 2008

These numbers have generally been rather steady for the past 7 years. But, as discussed below, underneath these top line numbers the sub-sector has been changing. These changes offer some distinct challenges and opportunities for smallholders, primarily in issues of milk productivity and sales, and in value-added processing both at commercial and artisanal levels.

6.3 Current Situation

Like dairy industries worldwide, in oPt it is largely a domestic industry, with relatively low levels of imports and exports. Per capita dairy consumption in oPt is lower than in neighboring Arab counties -- consumers are constrained by low purchasing power and would welcome increased access to better products at more affordable prices.

While there are some recent production and consumption trends of note, discussed below, the general structure of the industry appears fairly stable. However, it is reported that prior to the second Intifada (in 2000) more than 60 percent of fresh cows milk used in dairy-processing factories in Palestine came from Israel and there were few if any dairy farms with more than 50 cows. The current situation is quite different.

Figure 6.2, below, shows the current market map for the cow dairy sector in oPt.

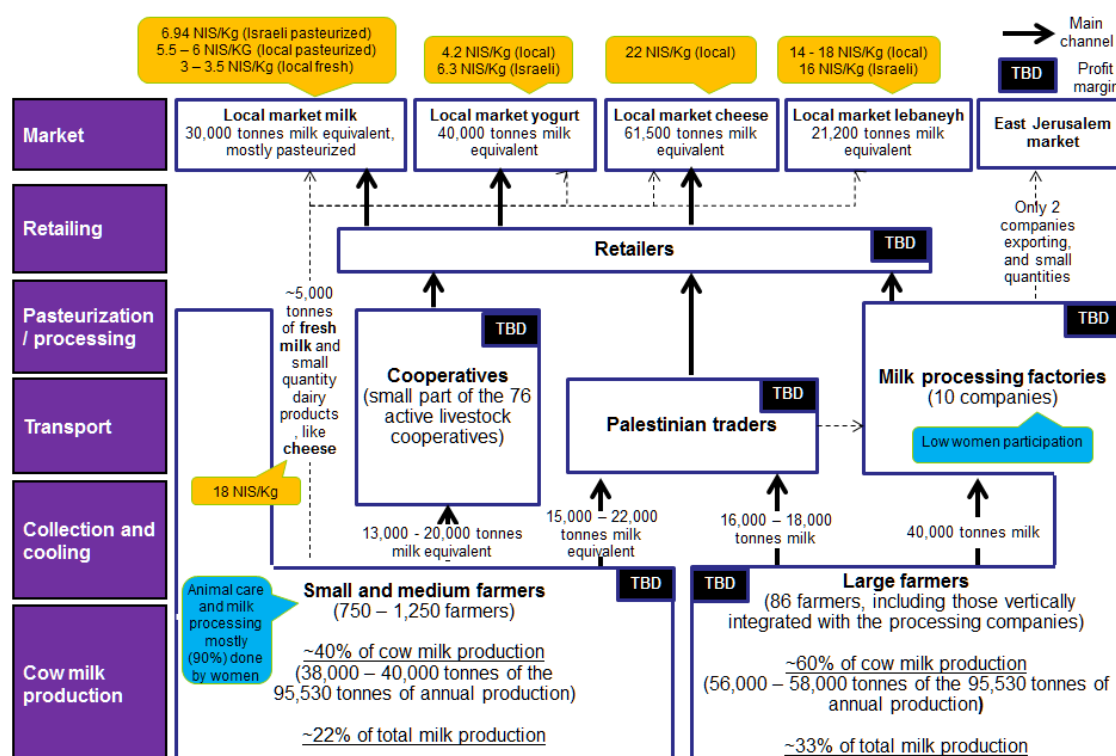


Figure 6.2 – Market map of the cow dairy sector

Demand

In 2008, and according to official figures of production and trade, overall demand for dairy products in oPt was 189,000 tonnes of milk equivalent¹⁵, 12% of which was satisfied by imports, valued at \$24.96 million (AOAD, 2009, p. 187). The following figure summarises this information about the dairy sector.¹⁶

Dairy	Domestic demand	Local production	Imports	Exports
Volume in 2008 (tonnes)	189,000	170,709 (95,530 cow milk)	22,140 (~\$24.96 million)	? (\$10-\$12 million)

Figure 6.3 – Dairy demand, production, and trade in oPt in 2008

Raw and pasteurised milk, yogurt, and cheese are the most consumed dairy products in oPt, with *labneh* also commonly consumed. While demand for raw and pasteurised milk is flat, demand for yogurt, cheese, and *labneh* is growing. Most of the yogurt, cheese and *labneh* consumed is produced from sheep and goats milk. It is reported that women are key decision

¹⁵ Milk equivalent is a measure of the quantity of fluid milk used in a processed dairy product.

¹⁶ It must be noted that the Palestinian Milk Council reports quite different and higher figures: 390,000 tonnes for total demand, and 188,000 tonnes for imports, both in milk equivalent. These higher figures suggest a much greater potential for domestic industry expansion.

makers regarding what types and brands of dairy products to purchase at the household level (Madi & Sawafta, 2011).

Of the US\$ 25 million in dairy product imports, most come from Israel, with a small part coming from Egypt (around 6%) and Jordan (1%) (AOAD, 2009, p. 424). The most common imported products are pasteurised milk, cheese, and yogurt. Imports are increasing (AOAD, 2009, pp. 316-318): the 22,140 tonnes imported in 2008 were 76% above the average annual imports between 2001 and 2005. Increased cheese imports made up 55% of this total increase. On the other hand, over the same period pasteurised milk imports decreased by 23%, to a 2008 figure of 4,020 tonnes (AOAD, 2009, p. 188).

Appendix 5, Domestic Demand for Dairy Products in oPt, provides available details about oPt's demand for dairy products.

Supply

In 2008 there were reported 19,414 cows and 4,948 heifer calves in oPt (PCBS, Agriculture Statistics 2007/2008, 2009, p. 51), the large majority (85% of the cows and 87% of the heifer calves) were Friesian, with the rest of the local variety. These animals were being held on the 14,000 animal holdings and 17,000 mixed holdings in oPt (PCBS, Press Conference on the Preliminary Findings of Agriculture Census 2010, 2011, p. 25). 87% of the cows and heifer calves on farms in the West Bank, mainly in Hebron, Jenin, and Nablus, as depicted in the figure below.

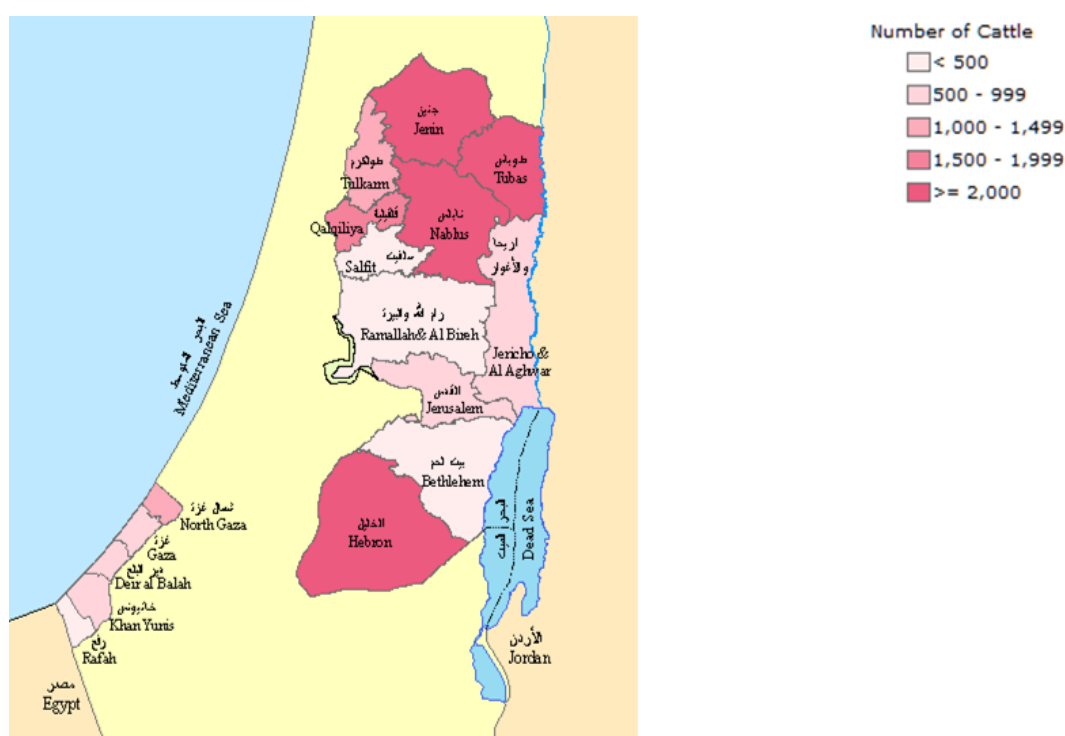


Figure 6.4 – Geographic distribution of cattle in oPt

As the figure below depicts, the total number of cows has remained relatively constant since 2004. However, there is a clear downward trend in the number of cows in Gaza (based on decreasing attractiveness of the prevalent extensive production system, and related to the Israeli closure), and (less strongly) an upward trend in the number of cows in the West Bank. (PCBS, Agriculture Statistics 2007/2008, 2009, p. 51), (PCBS, Agriculture Statistics

2004/2005, 2006, p. 49), (PCBS, Agriculture Statistics 2005/2006, 2007, p. 49), (PCBS, Agriculture Statistics 2006/2007, 2008, p. 51)).

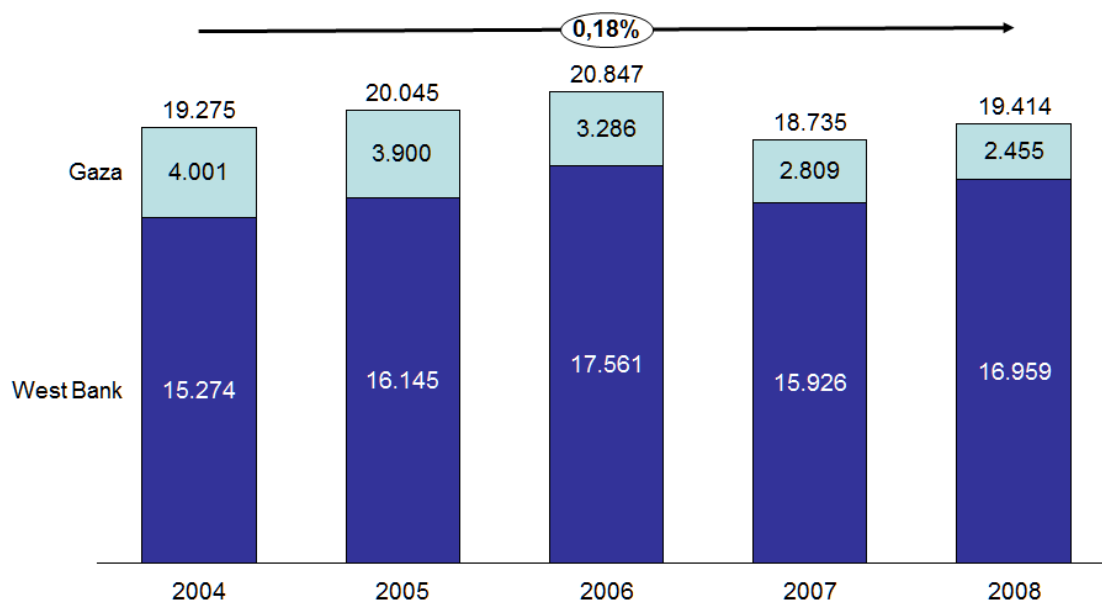
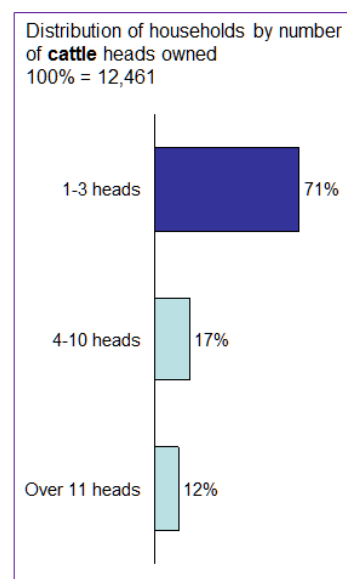


Figure 6.5 – Number of milk cows in oPt, 2004-2008

In 2008, and according to official Figures, the 19,000 cows produced 95,530 tonnes of milk, 55% of the total milk produced in oPt (172,000 tonnes).¹⁷ The distribution of these animals can be inferred from the figure to the right – the large majority of households keeping dairy cattle are smallholders.

Looking at trends of cow milk production (under official Figures), it has varied between 94,000 tonnes (in 2007) and 102,000 tonnes (in 2006), without any apparent long-term trend. The reported contribution of cow milk production to the total milk produced in oPt has varied between 51% in 2007 and 58% in 2005, also without any obvious trend.

Smallholder households predominate in dairy production, however it is estimated that 40%-60% of the cows (9,500 – 12,000) are raised by 86 large dairy farmers in the West Bank using an intensive production model. Of these farmers, 10 have more than 300 cows, and 76 have between 50 and 300 cows. These farmers report getting average yields of 26 - 30 litres per lactating cow per day (and higher) and selling to major dairies. Some large farms (e.g. An-Nama' Dairy Company) have their own veterinary staff and manage their own artificial insemination (AI) services, but most use private service providers. AI is reportedly only reliably available through Israeli firms via private agents. No detailed information was available on breeding issues. There are no large-scale dairy farms in Gaza.



¹⁷ However, according to the Palestinian Milk Council, cow milk production was 131,000 tonnes, representing 64% of total milk produced in oPt (207,000 tonnes).

Medium-sized farmers may be considered to have from 10 to as many as 99 cows; small farmers as having fewer than 10, the majority having 3 or fewer. Based on these numbers, and accepting that 40%-60% are raised by large-scale producers, it follows that the number of small and medium farmers is 1,000-2,500. This is in line with official data from 2005, where it is noted that 2.4% (around 750) of the animal and mixed holdings had only cows, and 34% (around 10,000) had a mixture of different livestock types.¹⁸

On these farms, production is typically semi-intensive. Women generally, and especially on the smaller farms, have primary responsibility (90%) for animal care and milk processing. Based on discussions during field visits, and other input, medium-scale producers seem to getting an average of 20 – 26 litres per lactating cow per day. Smaller producers average about 18 – 20 litres, meaning of course that some are lower. The smaller producers tend to rely on public sector services, weak as they are. The overall annual mortality rate is reported as usually 5%-10%. No detailed information was available on breeding issues. While most producers are aware of AI, very few smallholders have access to its benefits.

In Gaza, around 1,700 cows are raised by small farmers who have fewer than 6 cows, 500 by farmers who have between 6 and 19 cows, and 250 by farmers who have 20 or more cows (Laeremans & Sourani, 2006, p. 3). The figure below shows the cost of milk production for a typical small farmer.

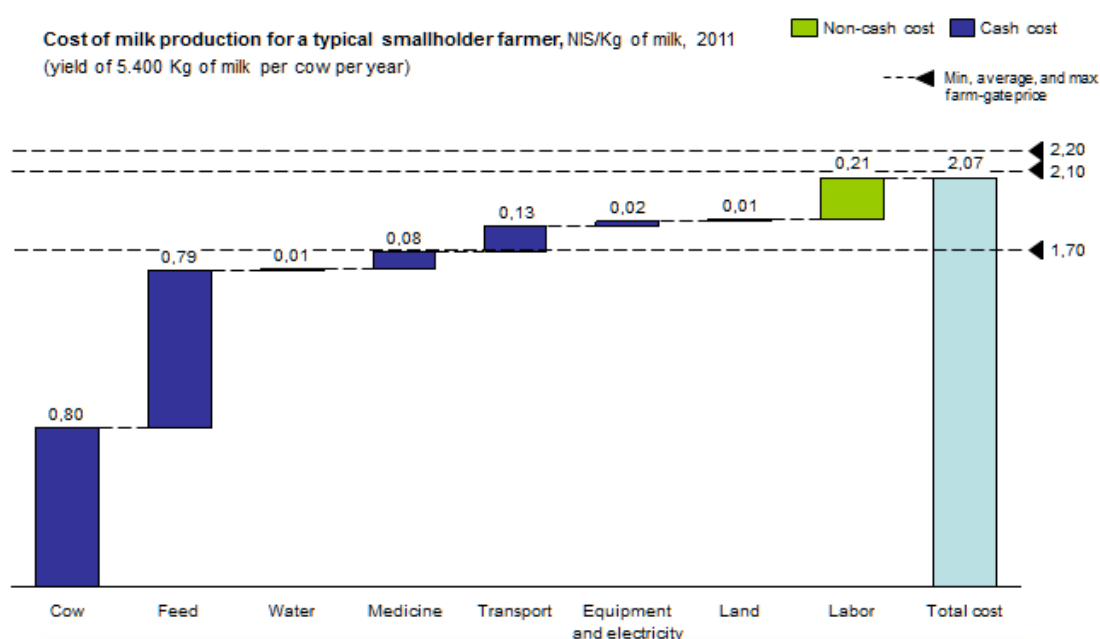


Figure 6.6 – Cost of milk production

However, it is important to note that production costs reported during field visits varied significantly, as depicted in Figure 6.7, below.

These smallholder farmers (typically their wives) sometimes process the cow milk into traditional products, like cheese, yogurt, or *labneh*. Such processing is generally a family micro-enterprise. The traditional processing and handling techniques used often result in low quality final products. In some cases, storage and transportation means are deficient, with

¹⁸ The 2010 *Integrated Report for The Palestinian Agro-Production and Marketing System (Case Study of the Northeast Jordan Valley Area)*, by ARI and ACF, found that while 16% of the 75 smallholder agricultural producing households in their sample held livestock, only one household had dairy cattle – a single cow.

further negative consequences on the quality of these dairy products that reach consumers. In general, home processing is more popular for sheep and goat milk.

As is the case for sheep and goats, the primary cash operating expense for dairy cattle – by far – is feed. This is typically purchased from local dealers. In Hebron -- where a significant share of oPt livestock is raised -- there are 2 wholesale companies selling directly to farmers and to retailers; one of them sells 5,000 - 6,000 tonnes of feed annually. There appears to be ample feed supply in the market.

Accounting for up to 40 – 55% of overall dairy expenses, this feed usually consists of: 1) a concentrate mix, to provide critical levels of protein, energy and minerals (prices range from 1.7 and 1.9 NIS per Kg, depending on the quality), and 2) roughage, usually consisting of some mixture of barley, maize, wheat bran, and hay (priced around 1.2 NIS per Kg).

Feed costs have been increasing in recent years, as depicted in the figure below. Some informants report a steeper and more problematic rate of increase in the past 12 - 24 months.

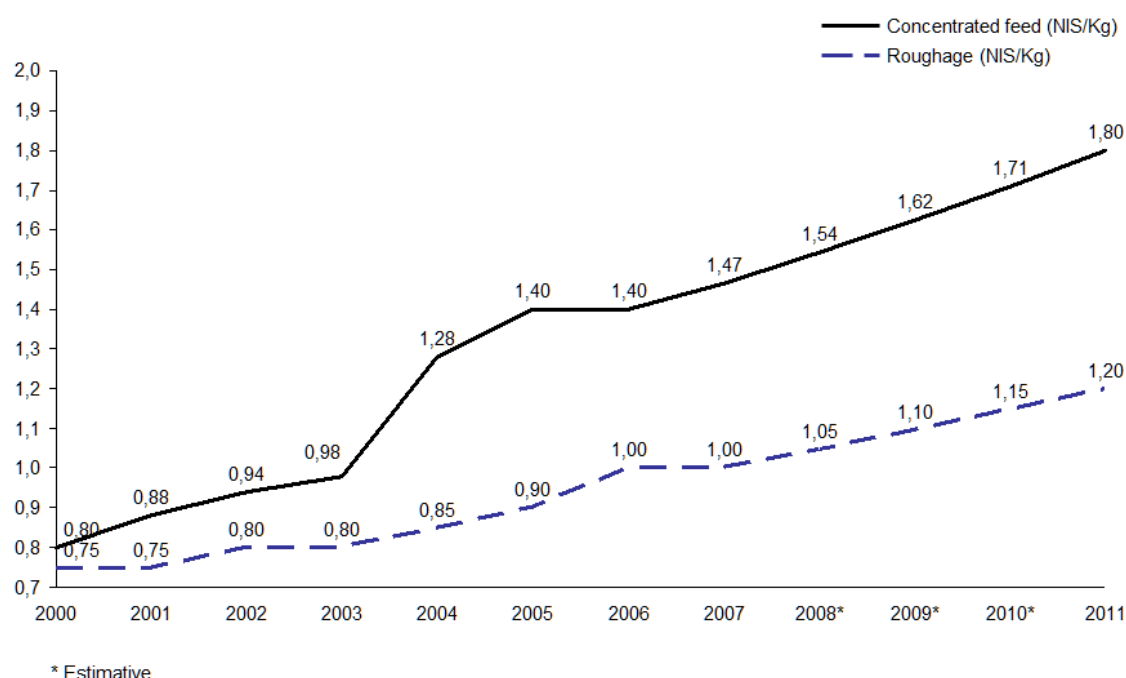


Figure 6.7 – Cost of Feeds over time

Given the importance of feed in the cost structure of dairy production, this increase is felt especially hard by the smaller farmers, who typically pay more for feed and are more vulnerable. The typical coping mechanism adopted by the small farmer is to feed less (and try to shift to increased grazing), or shift to less expensive (but lower quality) feed.

Across the oPt, the reported overall cost of milk production appears to vary considerably, per the following figure.

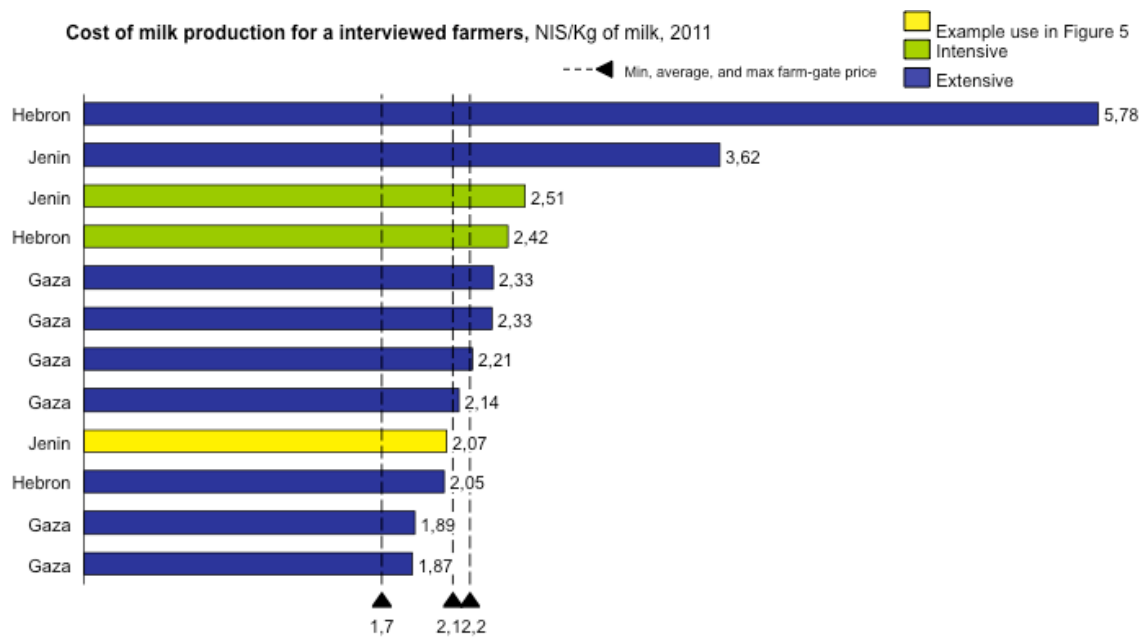


Figure 6.8 – Cost of milk production for the interviewed farmers

These differences are largely explained by different patterns of input usage, and varying unit costs and productivity reported. As examples, based on the information collected in the field visits:

- Farmers in Gaza report spending an average of 250-300 NIS per cow annually on medicines (although the median expenditure was significantly lower, less than 100 NIS), while those in Hebron and Jenin reportedly spend around 400 NIS. Unlike in sheep and goats, there appeared no correlation between the size of the herd and the investment in medicines per animal.
- Opportunity cost of labour varies from 5 NIS to 10 NIS per hour, being more expensive in the West Bank (an average of 8-9 NIS per hour in Hebron and 9-10 NIS per hour in Jenin) than in Gaza (5-6 NIS per hour)
- Smaller producers (from 3 to 12 cows) use an average of 76 litres of water per day per cow, and larger producers (from 25 to 400 cows) use an average of 143 litres per day per cow. Prices of water per cubic metre (1,000 litres) vary between 1 NIS (in Gaza) and 5 NIS (in Hebron); this price disparity generally holds true throughout these two governorates. In Jenin we see a somewhat different situation: prices there average 3 NIS per cubic metre, but vary from 2 to 4 NIS
- Farmers interviewed reported milk productivity per lactating cow of 26 litres per day for medium and large producers, and 20 litres per day for small farmers

While it proved impossible to develop a full picture of farmer organisations in the dairy sub-sector, its basic structure is clear. Membership of existing dairy cooperatives are largely medium-scale producers. Most cooperatives focus on improving access to inputs and services. Some cooperatives buy raw milk from farmers to market or process. A few cooperatives also provide assistance to small farmers, mainly around input purchasing and husbandry training. Women's membership and participation in these cooperatives is reportedly 15%-25% of the total.

Cold chain infrastructure at the farmer level is limited. Even farmers supplying the industrial processing plants mainly sell their unchilled raw milk; the transportation from farm to plants is not refrigerated. The containers typically used are large plastic barrels, which pose sanitary issues.

There are 10 milk processing factories in oPt. These operations reportedly absorb 40,000 of the 95,000 tonnes of cow milk produced annually. Some of these companies are increasingly vertically integrating and have their own large dairy farms. Before the second intifada, between 40% than 60% of the raw milk used by these factories came from Israel. Nowadays, all the raw milk comes from oPt. The scale of production varies widely from one factory to another. Few women are employed by these companies.

These factories are operating on average at 45% of their capacity. For instance, Al Junidi is operating at 55% of capacity (it is processing 65 tonnes of milk per day), and Alwaha Rawafed factory, in Gaza, is operating at 35% of capacity (it is processing 175 tonnes of milk per day). Profitable plant operation reportedly requires at least 20%-30% capacity utilisation.

Compared with Israeli (and even Jordanian) dairy plants, Palestinian dairy operations are quite small, both in terms of their production capacity and the range of products they manufacture. Production technologies have improved markedly in recent years, yet they still lag behind those in competing Israeli firms.

In terms of cold storage infrastructure, these industrial factories have adequate equipment and capacity.

There is potential to work with the one-third of processors that do not have quality standards (ISO 9001 for Quality Management Systems and ISO 22000 for Food Safety Management) and there is potential to improve quality control (through surveillance and monitoring systems).

The following table summarises the differences between West Bank and Gaza:

Areas of Difference		West Bank	Gaza
Producer Access to Inputs	Land issues – e.g. % producers using extensive production system	50%	20%
	Feed/Forage	Yes (5% of animal feed)	10-20%
	Concentrates	Yes (95% of animal feed)	100%
	Medicines	yes	yes
	Young stock	yes	no
	Artificial Insemination	yes	yes
Capacity of Farmer Organizations	No. Organizations & Members	15 cooperative 330 farmers	1 cooperative 55 farmers
	Collective Marketing	Yes (milk)	no
	Access to Credit	no	no
	Access to Inputs	yes	no
Main Products and Markets	Cattle Milk	83,000 tons	12,000 tons
	Cattle milk products	Pasteurized milk Yogurt, labaneh, cheese	Yogurt, labaneh, cheese

Dairy Trade with Israel:

While oPt's dairy industry is largely domestic in nature it does benefit from significant trade with Israel. In 2009, according to official trade Figures (PCBS, Registered Foreign Trade Statistics, 2009, p. 53), oPt exported around \$11 million of dairy products, mainly to the East Jerusalem market (and small volumes – no more than 2% of the total exported value - to Jordan (AOAD, 2009, p. 388)). The majority of these products were yogurt, cheese, and *labneh*. There has been a substantial +/- 60% increase in the value of exports since 2007, when oPt dairy product exports were valued at around \$6-\$7 million (PCBS, Foreign Trade Statistics 2007, 2008, p. 52).

Israeli imports have decreased significantly in recent years. It is unclear if there is a policy component underlying this. In 2004 and 2005, Israel was importing 150,000-170,000 of milk equivalent dairy products, according to (Israel, Food Supply Balance Sheet 2004 and 2005, 2006, pp. 24, 28); by 2009, this had shrunk to 67,000 tonnes of milk equivalent of dairy cow products (Israel, Food Supply Balance Sheet 2008 and 2009, 2010, p. 26). Over this same period Israeli milk production increased.

The figure below summarises this information.

Dairy (cow)	Domestic demand	Local production	Imports	Exports
Volume in 2009 (tonnes milk equivalent)	1,356,618	1,335,175	67,048	45,655

Figure 6.9 – Dairy demand, production, and trade in Israel, 2009

Market linkages:

This study concludes that the primary market opportunity is to pursue an import substitution strategy to supply a growing domestic market. Based on current trends and retail prices, oPt seems to be able to compete against imports of liquid milk, both raw – as a raw material for value-added processing – and pasteurised. Most of the market constraint is the weak linkages between small and medium farmers and industrial processing, mainly due to internal pricing issues. Generally, it was reported that prices offered small farmers in their local raw milk markets were 20-25% higher than those offered by the processors or their agents presumably in part due to the higher cost incurred by the dairies in buying from individual small farmers. Some qualifiers: this differential is seasonal, and the capacity of these local markets is limited, which sharply limits the growth potential for the small farmers without greater formalisation of the raw milk chain and stronger linkages to the processors.

That said, more research is needed: on current import statistics and trends, particularly for yogurt, where the fact-base is weak; on the dynamics of the local raw milk markets and chain across the various regions of West Bank and Gaza; regarding issues of product quality and consumer preferences; and price competitiveness of oPt against Israeli imports.

Yogurt demand has been increasing by 4.6% a year since 2004. Cheese demand has been increasing by 3.1% a year since 2004. To satisfy this demand oPt has been increasing imports, which have doubled since 2000. Imports currently account for 16% (some 2,000 tonnes, 10,000 tonnes of milk equivalent) of the total demand.

This trend of increasing demand is expected to continue, as oPt is behind other Arab countries in terms of consumption per capita of dairy products. As an example, oPt would consume an extra 103,000 tonnes of milk-equivalent products (both of cow and sheep and goat origin) per year if its per capita consumption was the same as Jordan's.

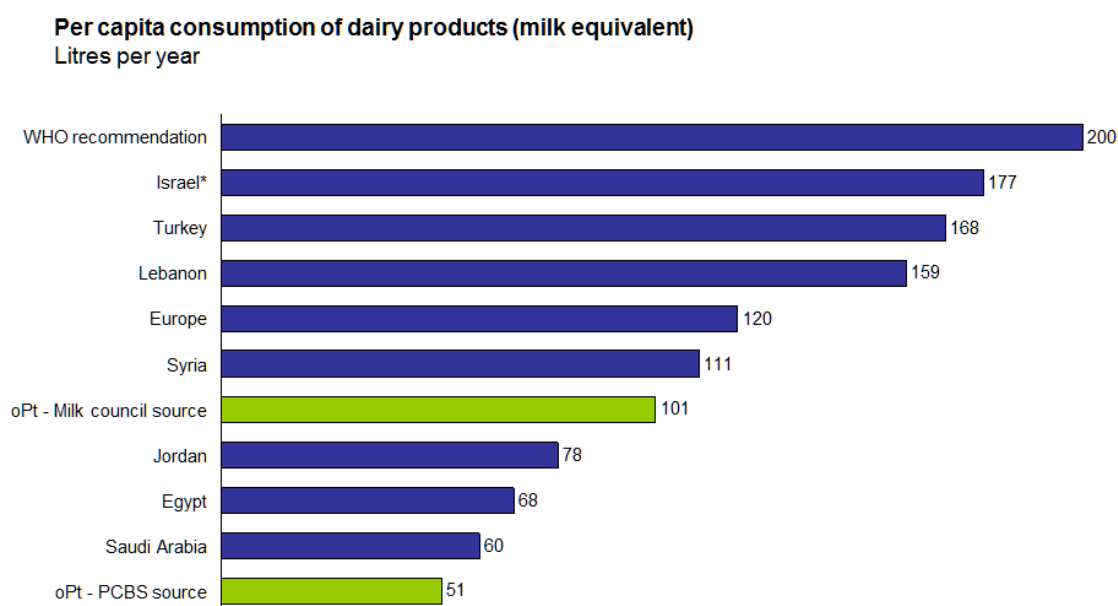


Figure 6.10 – Per capita consumption of dairy products

Farmers' costs of production can be decreased through an increase in productivity (currently half of the benchmark reported by local industry experts) and through a decrease in feed costs (which accounts for 40% of the total cost). This is depicted in the figure below.

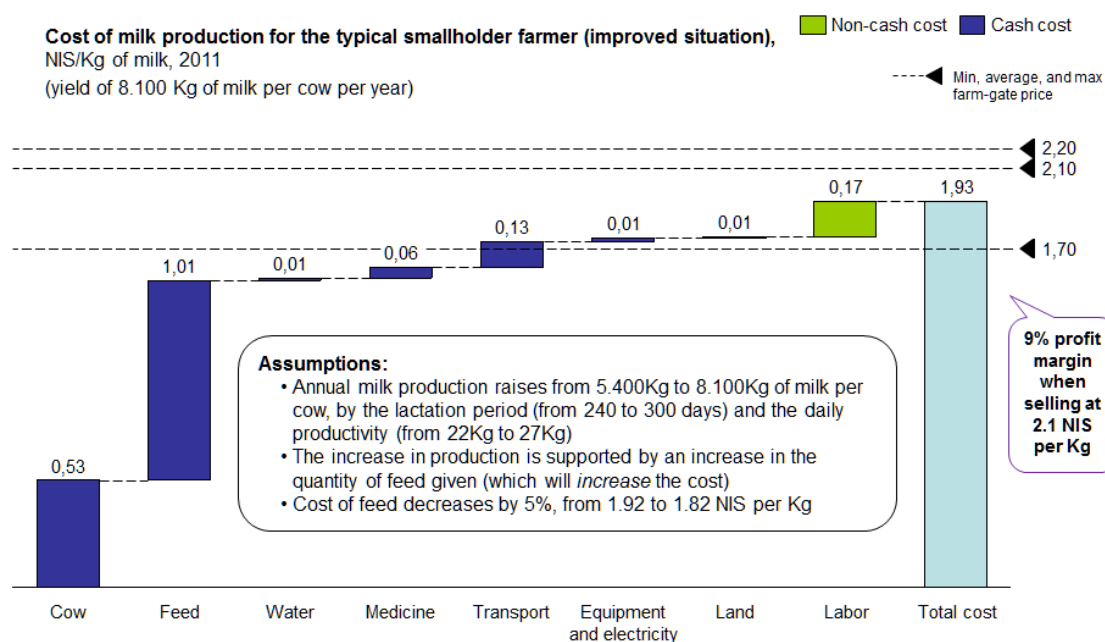


Figure 6.11 – Cost of milk production (improved scenario)

It is expected that oPt dairy producers could increase the current level of cow milk production by around 12%-16% during the next 5 years, from the current 95,000 tonnes of cow milk equivalent, to 107,000 – 110,000.

6.4 Constraints:

Figure 6.12 shows the constraints that are affecting the integration of poor smallholders and women in the market opportunities identified in the previous section.

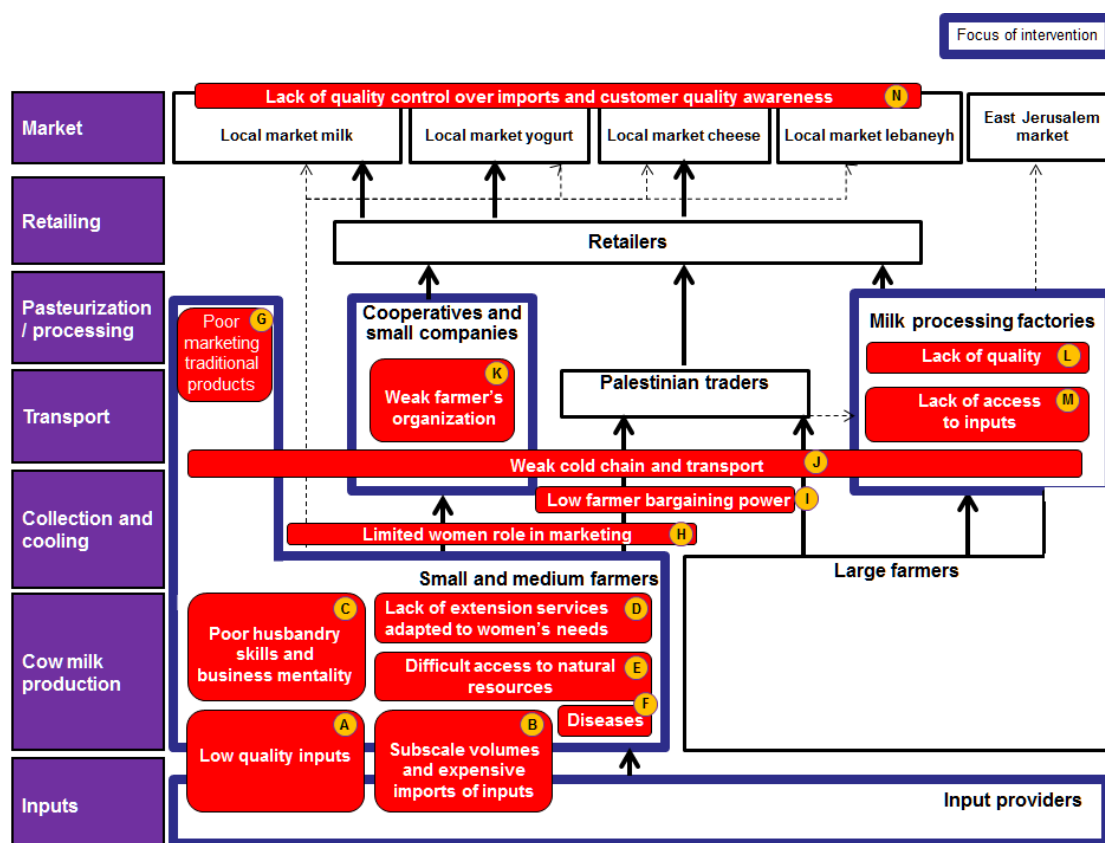


Figure 6.12 – Bottlenecks affecting the dairy sector

The following sections discuss each of these bottlenecks, with a description of the symptoms and an explanation of the root causes.

A & B - Low quality and high-priced inputs

Genetics: Most of the heifers are imported from Israel, through a local middleman. Usually Palestinian farmers, especially the small ones, are not able to inspect the animal before buying, and often end up paying for a higher quality animal than they actually receive. The cost of a heifer, both in the West Bank and Gaza, is reportedly around 12.000 -14.000 NIS for the Friesian varieties and less than 10.000 NIS for the local variety. However, some small farmers report paying significantly more for the Friesian variety: around 17.500 – 22.500 NIS. This difference can have a significant impact in the cost of milk production, as the amortised cost of the cow accounts for 25%-40% of the total cost of milk production.

Feed: To cope with an increase in feed costs, it is common practise for farmers to use lower quality feed, either by choosing a lower quality protein mixture, or by decreasing the amount of protein mixture and increasing the amount of roughage fed.

These smallholder problems reflect three major factors:

- High dependency on heifer imports.
 - For genetics, this is due to a lack of local breeding stations and/or access to quality AI services
 - For feeds – only 5-20% of animal feed used in oPt is based on local crop production. This lack of local feedstock production is aggravated by low access to information about the products available for purchase (characteristics, quality, price)
- Lack of purchasing scale and low negotiating power -- small farmers are largely unorganised and lack bargaining power. Cooperatives reported achieving discounts of 5%-15% on the cost of feed when purchased in large volumes. There is, however, no monopoly on the supply side, and the farmers can choose among a variety of input suppliers
- Lack of access to working capital, mainly due to lack of scale, and lack of adequate financial products available to farmers

C & D - Poor husbandry skills and limited business knowledge

Herd milk productivity is based on three key variables: daily productivity, lactation period and the length of time between an individual cow's births. These can be improved in oPt, as partially depicted in the figure below, which uses information collected during field visits, and uses a benchmark defined by the oPt Milk Council.

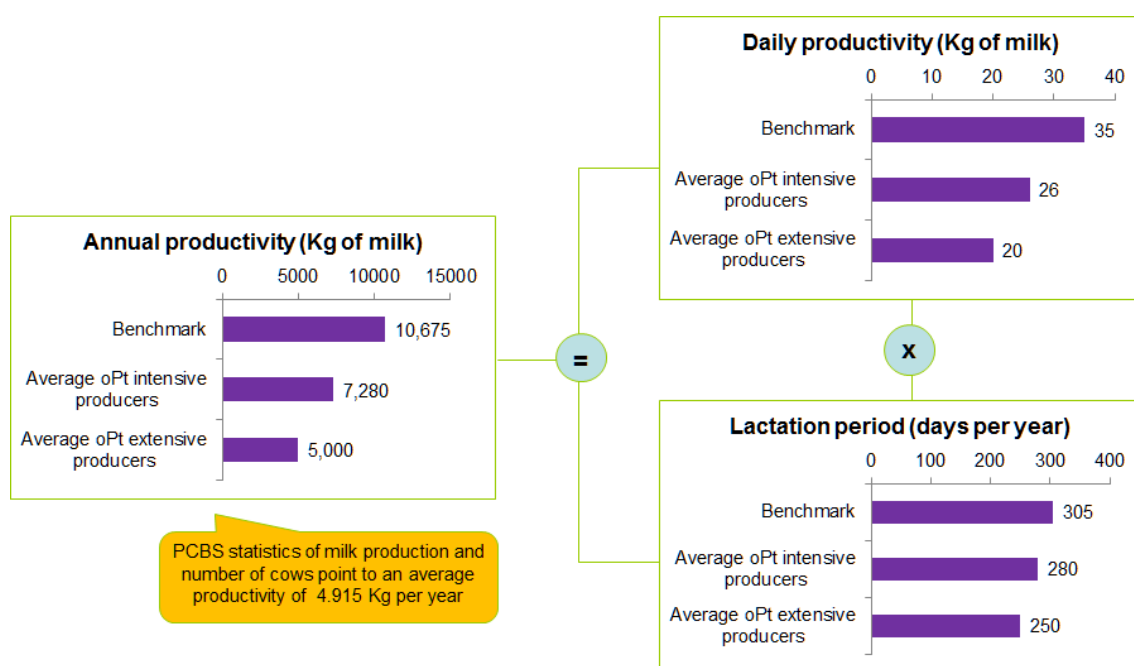


Figure 6.13 – Milk productivity in oPt

According to field interviews, daily productivity among producers is highly variable, depending largely on the type of production model, as depicted in Figure 6.14.

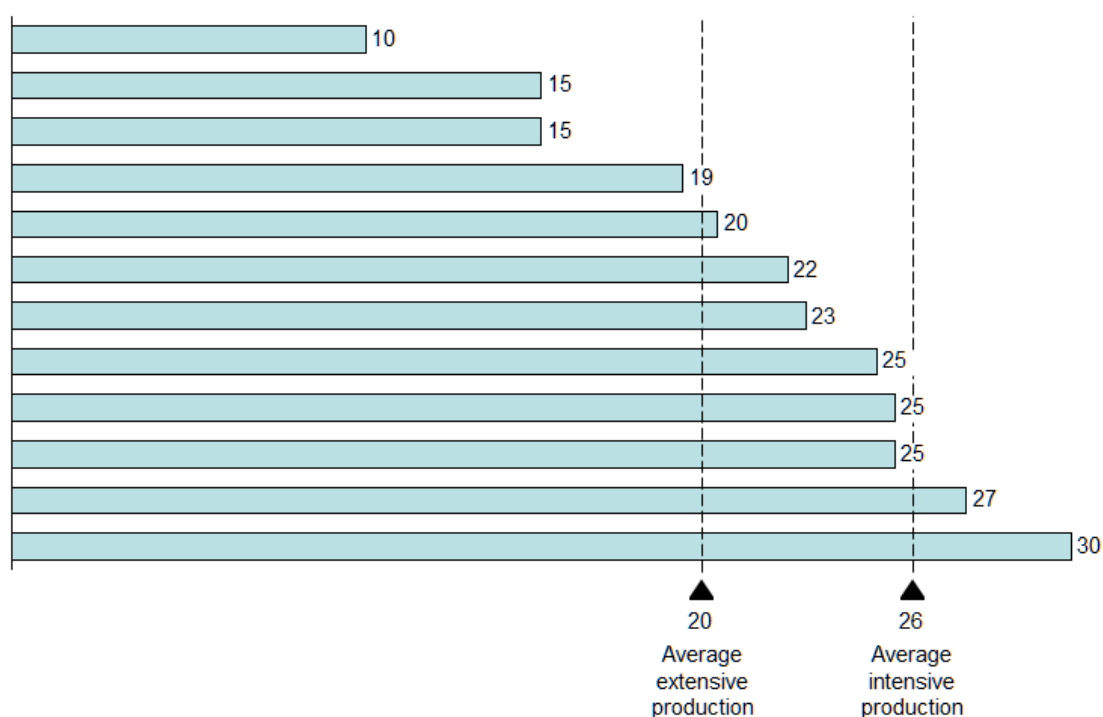


Figure 6.14 – Milk daily productivity (litres per cow)

These differences are largely attributable to differences in management and husbandry skills, and different feeding regimes.

The cow mortality rate in oPt varies between 5%-10% p.a. for adult animals (against a benchmark of ~2%), and is around 5% for newborns 0-4 weeks (in line with benchmarks).

Underlying these poor practises and underperformance is farmers' poor business acuity. The organisation and implementation of training programmes to redress these problems by either private or public agents are hampered by:

- Lack of farmer organisations; training of individual farmers is harder and much more expensive
- Inadequate / poor quality of available training / support to smallscale farmers from both the public and private sectors
 - Private Sector
 - Lack of incentives for dairy or feed processors to invest in farmer training
 - Limited private sector capacity in smallholder development
 - Public Sector
 - Lack of veterinary and extension services resources
 - Poor operational support to extension services
 - Lack of applied training for extension workers
 - Lack of incorporation of farmers' feedback into extension agents' training
 - Women have a strong preference for receiving extension services from other women. The large majority of extension officers and veterinarians are male

E - Difficult access to natural resources

Farmers report a decrease in the availability and productivity of rangelands suitable for cattle. In combination with other issues, these factors are resulting in reduced numbers of dairy cattle being farmed using an extensive production model, particularly in Gaza. Improved dairy productivity and linkages into the commercial processing industry need to be based on more intensive production systems that offer better and more consistent productivity and husbandry standards. So, while this rangeland issue negatively affects some of the poorest small cattle and dairy producers, it is not seen as a priority for sector intervention.

Water, however, is a more cross-cutting factor. Issues of water availability are broadly challenging. Limited access to water, its pricing, and issues of water quality, affect many smaller producers. It is understood to be pushing some small farmers out of the sector entirely (mainly in Hebron).

Access to natural resources is affected by:

- Israeli occupation has closed off traditional grazing lands
- Shortage of water, due to
 - Droughts
 - Limited and inefficient distribution systems
 - Israeli occupation
 - Competition for supply with urban areas
- Poor quality water
 - Increased salinisation
- Damaged water systems

F - Animal Health

Not surprisingly, extension and veterinary services provided by both the Ministry of Agriculture and private service providers, tend to go to medium and larger farmers, and are believed to be reasonably effective, though of uneven quality. Small farmers benefit little from these service providers. They receive some advice from suppliers and dealers, but its quality is mixed.

The majority of dairy producers visited (8 out of 13) reported having problems with diseases (particularly mastitis and reproductive system diseases). Diseases affect both productivity and milk quality.

The core issues underlying animal health challenges:

- Lack of smallholder knowledge of disease prevention, management and control
 - Lack of trained agro-vets
 - Lack of farmer organisations, which makes training harder
 - Poor connection between research and producers
 - Lack of extension and veterinary services resources
 - Lack of applied training for extension workers
 - Poor operational support to extension services
- Lack of a regional approach to disease information and management
- Misaligned incentives of input dealers and producers

G, H, I, J & K - Poor marketing and limited women's role

Individual small farmers have very limited negotiating power; for the most part they are price-takers.

After meeting family needs, small (and most medium) farmers usually do one of two things with the milk their cows produce:

- They sell the raw cow milk directly to consumers (less than 5% of time), to cooperatives, or to middlemen (most common scenario). The current farm gate price is typically 2.1 NIS per Kg, very close to their cost of milk production (this study found an average of 2.07 NIS per Kg, but highly variable across interviewed farmers). The prices paid by middlemen to producers is somewhat volatile over time, reflecting multiple variables.
- They process the raw cow milk, mainly into yogurt or cheese, and sell to other households, to cooperatives, or to middlemen, who then sell to retailers. However, this latter option is not very common, as cow milk is generally considered to be difficult to process at the household level, compared to sheep and goat milk.

Large farmers usually sell their cow milk to milk processing factories (who then pasteurise or create other dairy products) or to Palestinian middlemen (who then usually sell to factories or to retailers). Two of the ten processing factories sell to the East Jerusalem market, but the majority of the dairy products go to local retailers. The processing factories reportedly have profit margins of around 5%-10%.

The underlying challenges are commonly known, and include:

- Lack of market information
- Lack of scale
- Households pressures for immediate cash

Women, particularly in extensive smallholder producer households, shoulder much of the work burden related to livestock rearing and dairy production. While their husbands own the animals, women are often responsible for milking, farm sanitation, and milk processing. Despite this, women play a very limited role in marketing (especially in urban areas, where prices are higher) and sell their products at a lower price closer to their households. They also typically have little control over the income derived from the marketing of milk and dairy products they process.

The main root causes for this are:

- Competing work demands associated with women's reproductive, household and cultural roles, which makes women unwilling and unable to devote time to these and other activities (e.g. travel to farther locations to sell their products)

Instead, products are typically sold to small traders, who transport and sell in urban areas, often gaining significant margin.

Farmer organisations, where they exist, are typically neither well-governed nor well-managed. This is largely due to:

- Poor business and management skills of both members and leaders – limited ability to organise and maintain sustainable operations
- Poor infrastructure, equipment and ability to deliver services to farmers -- resulting in provision of a limited range of low quality services to cooperative members

Even within cooperatives, there appears to be weak marketing capacity for the dairy products women produce (yogurt, cheese). This weakness stems from:

- Lack of market linkages and stable trade relations with local businesses

- Lack of product diversification
- Poor product and packing quality
- Lack of market information, especially for women processors

J - Weak cold chain and transport

Cold chain storage and transportation are weak, mainly among small processors. The main root causes are:

- Small scale, erratic supply and related diseconomies
- Outdated and insufficient cold storage capacity

L & N - Lack of quality of industrial milk processing and imports

Only two-thirds of commercial milk processors meet Palestinian Authority quality standards and are certified, a system monitored by the Palestine Standards Institution (PSI). PSI and responsible Ministries have limited capacity to monitor the quality of those without certification (e.g. proper pre-processing testing of raw milk, use of milk powder not being noted in product labeling, etc.). Any strengthening of monitoring and enforcement would be “supply-led” as there is little public clamor for change – consumers lack an understanding of the relative costs and benefits of consuming certified milk products -- despite reports of dairy products being imported of a quality below that advertised (mainly by the unreported use of milk powder). This relates to the general problem of weak enforcement of quality standards for imported products.

M - Lack of access to inputs by the milk processors

Processors report problems in importing certain needed chemicals for their core pasteurisation and UHT operations.

6.5 Opportunity

As stated above, the main opportunity for an improved dairy sector to benefit the small farmer producers is to improve the ability to link them to the processors’ spare capacity and supply the local market at lower unit costs, thus facilitating import substitution and building the basis for an expanding and more integrated sector into the future.

Our model-based projections indicate the potential to increase the value of marketed production in the sector by a cumulative \$8.8 million over the next 5 years. To illustrate this impact, if achieved, these increases have the potential to benefit 750 small-scale dairy farmers (assuming somewhere between 30 and 70 percent of the small farmers respond to efforts to engage them in improvements) by an average of \$2,900 per family per annum in the fifth year. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

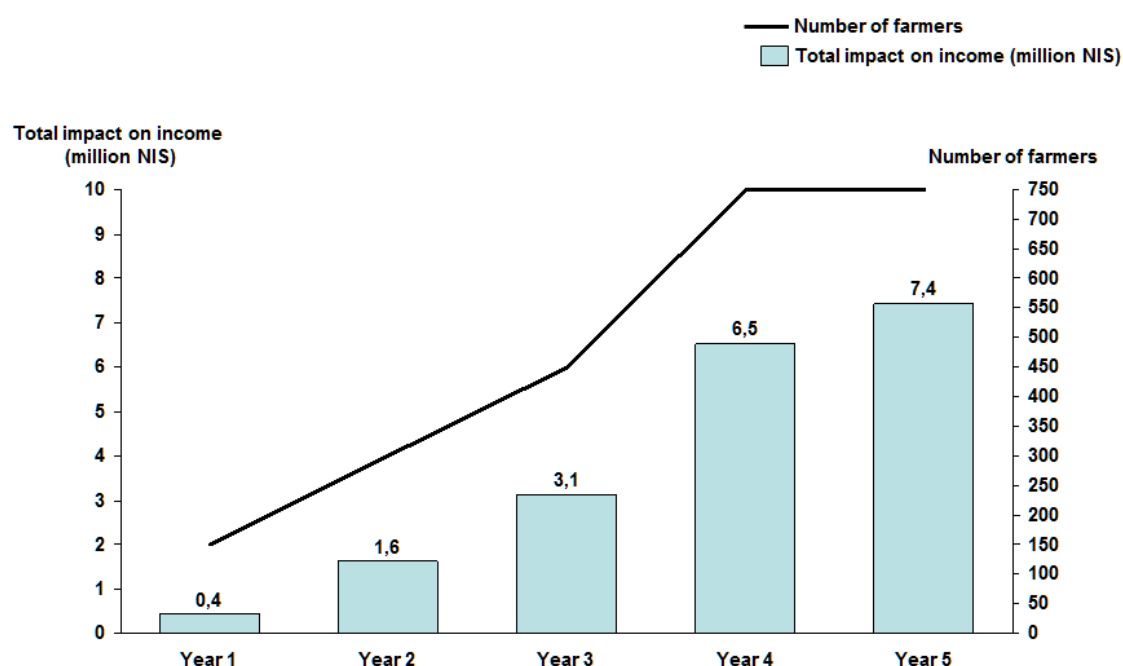


Figure 6.14 – Potential Benefits for Dairy Smallholders

6.6 Recommendations

Key constraints to enabling the market system to provide a stronger set of opportunities for smallholder dairy producers include crosscutting challenges common to much of oPt's smallholder agriculture, such as: farmer organisation, extension services, limited local availability of adequate and suitable water; limited access to needed finance; and poor access to high-quality appropriately priced inputs. These are covered briefly below. More can be found in this report's sections on crosscutting issues.

The following figure summarises the overall recommendations.

#	Recommendation	Key Actors	Timing	Co-dependencies	Risk of failure
1	Improve access to finance + Improve access to water + Improve extension services and training (see + Improve farmer organisation + Improve disease management + Improve cold storage infrastructure	Processors, input/ service providers PNA + Palestinian Water Authority Processors, Min Agr, Feed companies Mins. Agr, & Labour, NGOs Vet. Dep't Min Agr, service providers, farmer orgs Processors, farmer orgs, Milk Council	Short term	-	Medium
2	Strengthen market regulations	PNA + PSI	Short term	-	Medium

3	Improve access to markets and inputs information	MBOs, Farmer Orgs, Telecoms,	Medium term	Improve farmer organisation + Improve agriculture information	Low
4	Improve agriculture information ¹⁹	PCBS, MBOs, Farmer Orgs	Medium term	-	Low
5	Reduce dependency on imported inputs	Private sector and Min. Agr	Short term	-	Low

Figure 6.15 – Overview of the recommendations for the dairy sector

The following figure summarises the analysis of how these 5 different classes of recommendations will contribute to the modeled sub-sectoral projected benefits.

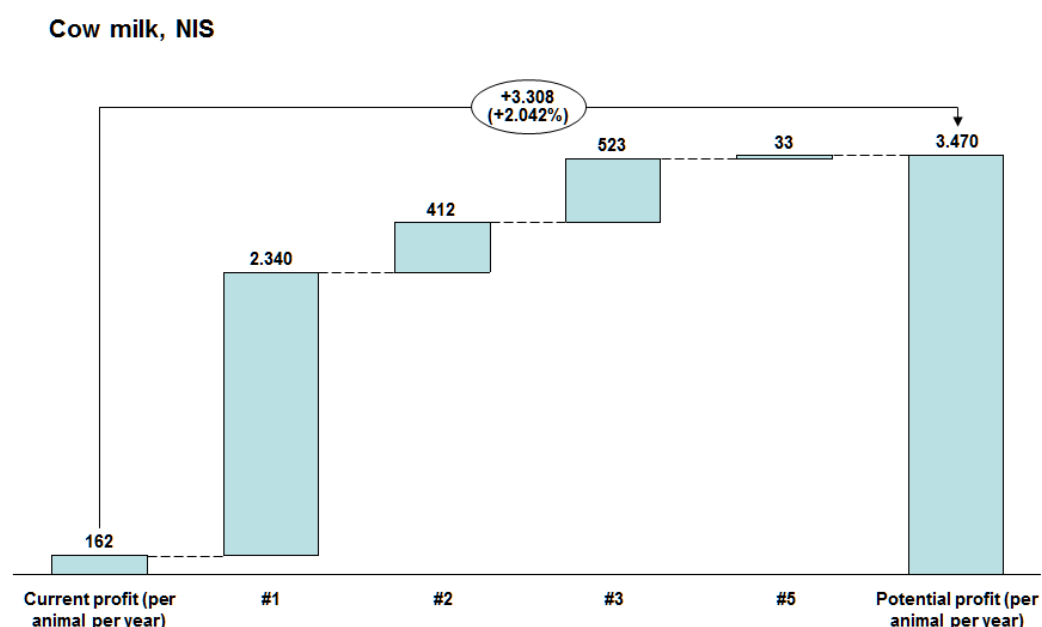


Figure 6.16 – Segmentation of impact on the dairy sector

Improve farmer organisation:

To capture economies of scale and access improved output markets, as well as laying the foundation for improved access to goods and services, small farmers need to be helped to organise into producer groups of 20-30 farmers, who together own 40-70 cows. At present, there is no catalyst that can help them achieve the economies of scale required to help the processors see them as potentially attractive suppliers worth reaching out to and investing in. A careful approach needs to be designed to work with stakeholders and build/align incentives for local processors to link to and support these farmer groups in order for them (the processors) to take advantage of lower cost supply and import substitution opportunities,

¹⁹ This intervention will facilitate the implementation of activity #3, but it was not considered in the impact calculations

which in turn will help them build more profitable growth enterprises. Work with local processors and stakeholders to support the organisation of farmers into producer groups of around 30 farmers each; and in turn support and build incentives for these groups to aggregate into milk collection centres that bring together 8-12 producer groups into an umbrella business unit comprising around 350 farmers – able to supply 6,000 – 9,000 litres of milk daily. Once a business case is proven for such groups, the farmers would be naturally incentivised to support the formation of these larger marketing units to achieve economies of scale and efficiencies in accessing inputs, finance, animal health and other needed services. The processors in turn would be able to manage their procurement more easily from these larger, better managed and more efficient units.

While the growth opportunity for the small farmers most readily lies in linkages to the processors, there is also likely potential for the stronger farmer organisations to play a role in supporting greater formalisation of the raw milk chain as well. Experience from Kenya, indicate the considerable potential to improve the informal markets through a combination of market-following regulations and an informed regulator, strong farmer and trader associations and incentives structured to encourage market participants to adopt improved practises that are in their own self interests.²⁰

Aggregating farmers into groups is also essential if they are to more efficiently and cost-effectively access needed goods and services, and develop the “voice” needed to advocate for their policy needs. Initial steps should include: 1) training – both in technical and commercial issues and in issues of group dynamics and leadership -- and 2) access to financial services. These two components are needed to open the gates to market linkages with processors and align incentives and opportunities for smallholders to: seek information; invest in better husbandry practises, feeds and animal health services, and farm infrastructure; and invest effort in building and maintaining solid and sustainable producer groups.

The exact model of the market linkages and collection centre may vary, and they need not be standardised. In some cases it may prove best to co-develop the collection centre with an interested and appropriately motivated processor, who would be expected to be a major co-investor. In other situations the groups might better be helped to establish the bulking and chilling operations as fully independent and free-standing enterprises. While this latter model might need to rely more on debt financing and donor support, and likely require higher levels of group cohesion and self-management it would be expected to result in such groups having greater freedom of action and market leverage, as well as in the next stage of the local industry’s maturation to have greater flexibility about supplying the local raw milk market as well as the processors.

In either case the intention should be for the collection centres to develop as ‘hubs’ that coordinate access to priority services for member-suppliers, including access to finance, feeds, animal health and breeding services, and other services.

Producer Groups and their collection centres can help aggregate demand, facilitate information flows, and negotiate for better prices for better productive goods and services. Feeds, veterinary supplies and basic dairy implements could be purchased in large quantities, from reputable dealers, resulting in better process for better products.

To improve feeds and feeding practises, possibilities could be explored for farmer groups to contract with crop farmers for the production of forage or for quantities of crop residues, e.g. of green wheat straw. Working with crop producers a farmer field school approach might be

²⁰ See “Transforming the Dairy Sector – SITE Case Study”, SITE/Kenya, October 2010

used to encourage the testing and use of innovative practises for fodder production and preparation, such as supplemental irrigation to forage crops, the planting of fodder trees, and silage preparation. Some of these practises might fit well and positively complement ongoing farming practises by better maintaining soil moisture and fertility, and reducing erosion. And some might offer opportunities for women's groups.

Milk is mostly water. For cows, as well as growing calves and heifers, to be healthy and productive they need reliable access to adequate quantities of good quality water. For a smallholder family with two lactating cows, a dry cow and a heifer the daily needs will minimally be in excess of 200 litres. Here too, where producers lack ready access to piped water, the aggregation of demand may prove effective. In Kenya, milk collection centres help arrange financing – to be paid for out of future milk deliveries -- for smallholder suppliers to purchase or construct water storage tanks.

This remainder of this section focuses on 3 key recommendations unique to the cattle dairy sub-sector:

- reducing dependency on imported inputs
- improving disease prevention and management
- improving cold storage infrastructure

Key actors

The famers' organisations and leading industry processors will be the key actors here. The challenge will be how to resolve the conundrum that to make progress in improving the business models of each, requires actions by the other. The key will be to enable each set of parties to start to experience the win-win of the improvements in a climate with a lack of success models and trust.

Risk

While there are models of this working well in other countries, there is a medium risk of failure in the implementation of this recommendation.

Reduce dependency on imported inputs:

The following activities hold the promise of boosting productivity and lowering costs::

- Working with public and private sector agents to reduce dependency on imported heifers, and improve oPt dairy herd genetics, by incentivizing and supporting the development of cattle breeding stations and/or more wide-spread artificial insemination stations services.
 - This would require further market and technical research and analysis, leading to business model definition and commercial feasibility studies
 - If attractive, these would be promoted as investment opportunities for the private sector
 - In parallel with the investment promotion, the farmer's awareness of the benefits of artificial insemination should be increased, and information systems adequate to track and ensure service quality need to be established
- Reduce dependency on imported feeds by improving linkages between local crop producers and livestock feed mixers/sellers and explore and market support development of viable commercial opportunities to produce low-cost forage and feeds.
- Work with feed sellers to improve farmer knowledge of efficient and effective feeding practises.

- As part of the import replacement strategy, there may also be scope for impact by working with processors to develop an actual or virtual ‘brand’ for formal sector oPt dairy products. In Mozambique, TechnoServe led an effort that drew together a very fragmented commercial poultry sector and helped them effect major policy and enforcement changes, operational efficiencies, improved food safety standards, and launch a successful domestic brand. Over 4 years, 2005 – 2008, demand doubled and the nascent industry grew by some 400% to serve it. Broiler sales leapt from \$25 million in 2003 to \$160 million in 2009. *Business Monitor International* just published a report projecting continued robust Mozambique poultry sector growth into 2015.

Key actors

With initial NGO and/or consultant support in further analyzing the business cases, lead private sector firms should be incentivised and supported to take the lead in piloting new models of cattle breeding and AI, and improvements in concentrate and forage production and distribution, with support from the Ministry of Agriculture. The implementation of the other activities should be led by NGOs and the Ministry of Agriculture.

The Danish government has been working on this recommendation, especially on expanding and improving the use of silage.

Risk

There is low risk of failure in the implementation of this recommendation.

Improve disease management

The following activities can reduce and mitigate the negative impact of diseases on dairy operations:

- Improve farmers understanding of the financial costs they bear from cattle diseases
- Train farmers in preventive measures to reduce the incidence of disease, e.g. better milking practises and shed sanitation for mastitis control
- Support the Ministry of Agriculture and other service providers to promote the continuing training of veterinarians and animal service providers
- Promote and support the design and implementation of regional collaboration for disease management and measures to reduce the smuggling of cows into oPt

Key actors

The Veterinary Department of the Ministry of Agriculture should be supported to take the lead in the implementation of these activities, working with and through the private sector and farmer organisations.

No donors are currently engaged in these sorts of activities.

Risk

There is low risk of failure in the implementation of this recommendation.

Improve cold storage infrastructure

Simple milking sanitation measures and rapid cooling of raw milk are the key ways to maintain milk quality and ensure dairy product food safety. High quality raw milk results in lower processing costs and longer product shelf-lives – both key factors in competitiveness and profitability.

Improving the cold storage infrastructure at the farm/collection level, and the cold transport between collection points and the industrial processing plants is critical. Processors value chilling plants close to production areas; it provides quality assurance for them, without them having to manage relationships with the small farmers individually.

Given the poor current levels of infrastructure at these upstream levels of the value chain among smallholders, it will be important to perform a detailed review of:

- current farmer attitudes, behaviors and practises for milking and handling
- different models of cold storage (size, type of technology, etc.)
- alternative organisational and logistical models for chilling and transport, and the support needed for their development

With that information in hand, appropriate business partnerships between industrial processors and farmer groups can be promoted. Farmer group collection centres should be supported to assess the feasibility of and, if justified, to develop a bulking and chilling plant. One likely model is for the processors to install and operate bulking and chilling stations in partnership with farmer groups. Another is for bulking and chilling facilities to be owned, managed and operated by the cooperatives themselves. As noted above, this latter model can more broadly empower and support smallholders to become more productive and profitable. Importantly, any such effort should welcome the participation of larger, middle-scale producers – experience teaches the benefits of having more educated and sophisticated producers participate.

Regardless of its ownership structure, developed as a business “hub”, a bulking and chilling business can support its suppliers by coordinating and improving their access to a range of services, credit, feed, training and animal health. The promise of income from future milk deliveries effectively serves as members’ collateral, against which they can borrow for pre-agreed goods and services. Farmer field days and workshops can be organised to help potential service providers market themselves to their potential customers. This model has proven very successful in East Africa through work performed by Heifer International and partners²¹ in the East African Dairy Development programme funded by the Bill & Melinda Gates Foundation.

Key actors

The Milk Council should lead the implementation of this recommendation, with close involvement of private sector processors as financial and technical partners. It should be supported and facilitated by NGOs

There is no donor currently engaged in this area.

Risk

There is low risk of failure in the implementation of this recommendation.

²¹ Partners include International Livestock Research Institute (ILRI), TechnoServe, ABS and World Agro-Forestry Center (ICRAF).- see <http://eadairy.wordpress.com/>

7. Sheep & Goats Sub-sector

7.1 Executive Summary

The sheep and goat sub-sector in oPt is seen as attractive for 3 main reasons:

- It serves primarily a local market – border/trade challenges and restrictions are not a major factor
- It is a preferred meat by local consumers -- increased production efficiencies, and the lower prices they will permit, will result in expanded consumption
- Smallholders and women play prominent roles in production and local value addition

Current Conditions

The oPt sheep and goat market is characterised by high self-sufficiency and low volumes of exports. Annual sheep and goat meat production is estimated at around 10,000 tonnes. In the past decade, Palestinians have significantly shifted consumption from local fresh sheep and goat meat to imported frozen beef and chicken meat. This shift, in the face of continuing local taste preferences for sheep and goat meat, reflects the relative cost advantages of alternative meats in combination with Palestinians' decreasing purchasing power.

These factors, along with the decreasing availability of suitable grazing land and increasing costs of production, drives the ongoing shift from extensive production systems to more intensive management of sheep and goats. Together with recent years of relative drought, they also are largely responsible for a 20% reduction in oPt's herd size since 2007, to a current herd estimated at under 800,000 animals.

A still increasing majority of sheep & goats are now being raised a semi-intensive model of production, versus the extensive model. The majority of these animals are slaughtered and sold in small independent butcher shops, in both rural and urban areas.

Production Models: There are three basic production systems in use: extensive, semi-intensive and intensive, distinguished primarily by their differential use of purchased feeds and other inputs. Smallscale producers (fewer than 20 animals) predominate under all three production models. Medium and larger-scale producers tend to use semi-intensive or intensive production models. The herd split between the extensive model and the other systems is approximately 25:75.

Sheep and goat production is now practised by some 20,000 households. Production is widespread geographically, but is somewhat concentrated in Hebron, Jenin, Nablus and Bethlehem. Traditional breeds predominate.

Small producers account for some 80-85% of total animal numbers. These herds typically are managed by family members, especially by women and children. Milk and dairy products often figure prominently in these household diets and budgets: important to family livelihoods, improving liquidity, stabilizing income and consumption and as a form of savings.

Key Constraints

In addition to the major crosscutting issues facing all studied sub-sectors, such as farmer organisation, and access to finance and water, the key challenges to expanded production and profitability of sheep and goat production are:

- 1) Poor husbandry and management skills – Traditions run deep in smallscale animal rearing, and are reflected in the use of sub-optimum breeds and breeding and husbandry practises. Public and private extension services are limited, rarely suited to women's needs, and generally provide little of value in building smallholders' technical or commercial capacities.
- 2) Limited access to high quality inputs – producers experience difficulties accessing good quality feed and veterinary inputs or services at reasonable prices. Extensive herders are further challenged by decreasing access to suitable rangelands, making them increasingly reliant on purchasing water and expensive mostly imported inputs – and with rising food/feed prices this has sharply worsened in the past year.
- 3) Poor marketing, slaughtering and retail practises – most live animals are sold at relatively young ages to middlemen who sell to local butcher shops that slaughter and sell meat retail. With widely available refrigeration, issues of hygiene and food safety are deemed not major. Product pricing seems however to be problematic, with retailers inadequately flexible in their pricing practises to maximise either sales or profits.

Key recommendations

Recommendations to regenerate growth in this sector are mainly aimed at catalyzing market changes that will help producers' identify how to reduce their production costs and improve their competitiveness. To reduce costs it is necessary to incentivise improvements in feeds and feeding practises through import substitution – with particular focus on linking local barley farmers to feed businesses and the more organised farmer groups. The intent is to incentivise barley farmers to increase their productivity (which is relatively low at 256 kg/du.), and to increase the area under fodder crops by integrating fodder production in crop rotations.

It is also essential to work with butchers, abattoirs, fattening operations and other stakeholders to develop systems and incentives for producers to better orient their production to the market. This is likely to include aspects of seasonal demand and differentiated demand, e.g. for holidays and to suit consumer interest for meat (differentially priced) from both younger and older animals. These same stakeholders can be supported to put in place the improved access to financing needed for additional working capital requirements. To support these efforts, development of appropriate member business organisations (MBOs) for post-production enterprises should be explored.

Potential Impact:

Our conservative model-based assumption-based projections indicate the potential to increase the value of marketed production in this sub-sector by a cumulative \$13.9 million over the next 5 years. To illustrate this impact, if achieved, these increases have the potential to benefit 4,000 small-scale sheep and goat farmers (about 20% of the total population) by an average of \$750 per family per annum in the fifth year. This would be the first stage in a broader industry transformation that would scale to the rest of the local producers in the years beyond on the basis of successful businesses expanding their by-then proven models.

7.2 Introduction

Sheep and goats are among the earliest domesticated animals, and have been important in the Middle East for some 10,000 years. In modern Palestine sheep and goats, and their products, retain significant economic, dietary and cultural importance.

Through the broad sub-sector scanning that guided this research project, Palestine's sheep and goat sub-sector emerged in the top tier of attractive prospects for possible future programmatic interventions. This high ranking against economic and social attractiveness was based on 3 core factors:

- It serves primarily a local market - border/trade challenges and restrictions are not a major factor
- It is a preferred meat - increased production efficiencies and lower prices will result in expanded consumption
- Smallholders and women play prominent roles in production and local value addition

Additionally, another attractive aspect of the sheep and goat sub-sector is that improved rangeland and water resource management will help retard/reverse desertification.

7.3 Current Situation

The oPt sheep and goat market is characterised by high self-sufficiency and low volumes of exports. However, in the past decade, Palestinians have significantly shifted their consumption from local fresh sheep and goat meat to imported frozen beef and chicken meat. This shift, in the face of local consumer taste preferences for fresh sheep and goat meat, reflects the cost increases inherent in the move to the semi-intensive mode of production and the relative price advantages of alternative meats in combination with Palestinians' decreasing purchasing power.

The overall structure of the sub-sector's supply and demand has not changed significantly in recent years, except for the reduced importance of the extensive production model. Figure 7.1, below, shows the market map for the sheep and goat sector in oPt.

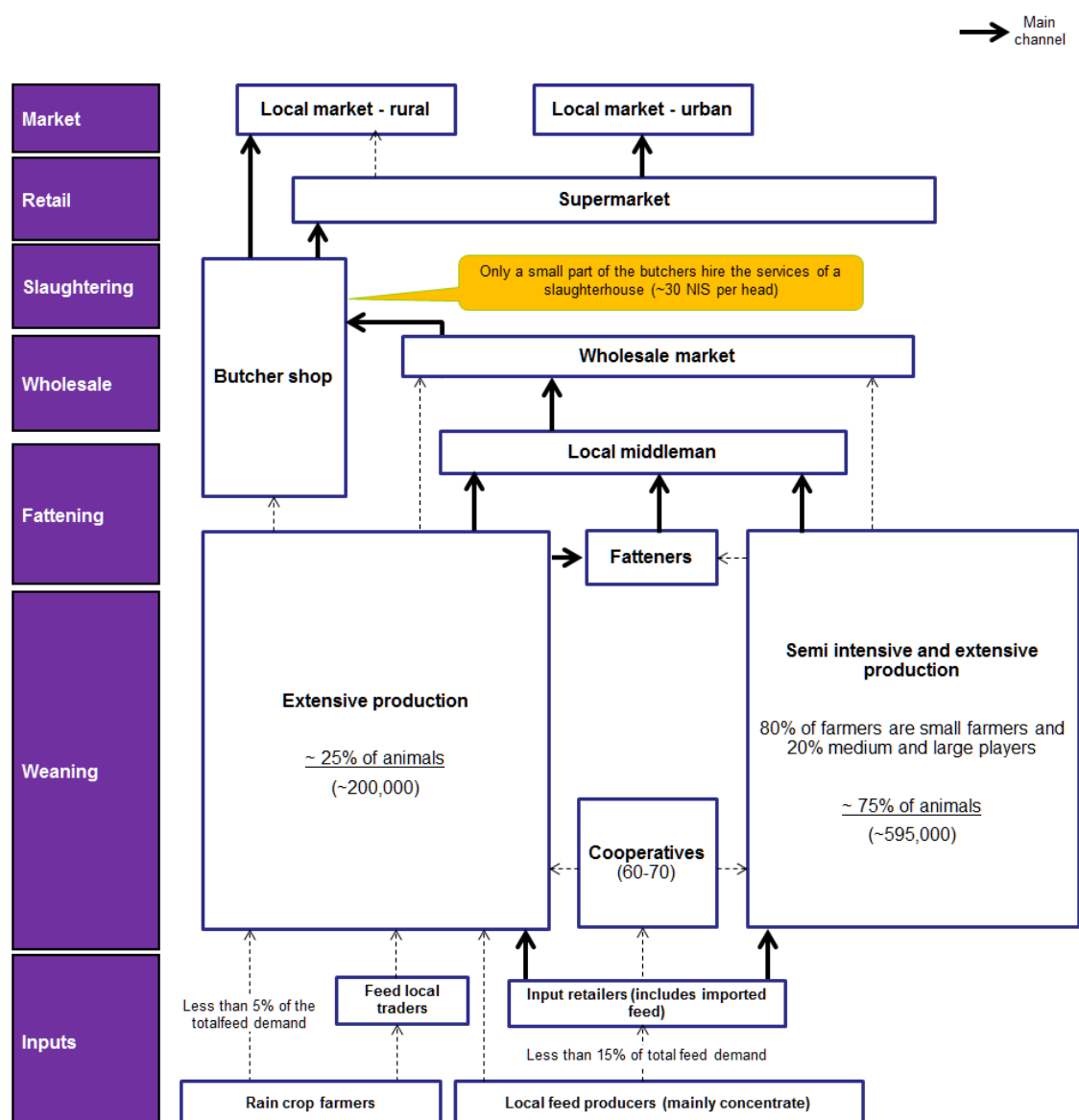


Figure 7.1 – Market map of the sheep and goat sector in oPt

Demand:

In 2009, reported domestic demand for sheep and goat meat ranged between 9,900 tonnes²² (2.5 Kg per capita per year) and 27,300 tonnes²³, the majority of which (98%) was fresh meat, not frozen; this is in line with local preferences for meat in general, where fresh meat accounts for 80% of the total meat consumed in oPt.

The typical consumer, in both urban and rural markets, prefers to buy meat that is slaughtered at the local butcher shop or by a household, as that meat is perceived as being fresher than the one slaughtered in official abattoirs (running at 10%-40% of capacity). Consumers prefer younger animals, particularly during holidays, and are willing to pay some price premiums.

²² According to calculations based on per capita demand. The analysis in the rest of this section are based on this source. This is a conservative approach. If the demand is higher, there is as greater opportunity in the sub-sector.

²³ According to the balance between production and trade. This very high and questionable figure is explored further in the text below.

The seasonal demand for sheep and goat meat is not constant, in particular it increases during holidays. There is also a strong difference observed between West Bank per capita demand and Gaza demand, though this may largely be explained by the much higher production of sheep and goats in the West Bank (94% of total meat production) than in Gaza (11% of all meat).

Current demand is being satisfied almost in its entirety by local production. Official imports of red meat are low (4,800 tonnes). Most of these imports are beef; some 1,000 tonnes is frozen sheep meat. There are no official exports of sheep and goat meat. The figure below summarises this information.

	Domestic demand	Local production	Imports	Exports
Volume in 2009 (tonnes)	9,900 – 27,300	13,800 – 26,300	1,000	-

Figure 7.2 – Sheep and goats meat demand, production, and trade in oPt

Per capita demand for sheep and goat meat has decreased by a third since 2005, and is now at estimated at 3.8 Kg, with per capita consumption in rural areas 25% higher than in urban areas. Population growth has reduced the effect of this drop on overall demand; the current level of total demand – estimated at 9,900 tonnes – is only a quarter below 2005.

This shift in consumption was both a cause and effect of a 20% reduction in oPt's herd size since 2007, to a current herd estimated at under 800,000 animals. This herd reduction, the decreasing availability of suitable grazing land and increasing costs of production, and recent sub-average rainfall has led a further shift from extensive production systems to more intensive management.

This decrease in domestic per capita demand resulted primarily from a shift in consumption to poultry: per capita consumption of poultry almost doubled between 2005 and 2009, reaching 11.9 Kg. Total red meat consumption over this same period dropped by some 15%, to 9.4 Kg per capita, with beef making gains against sheep and goat meat.

The key driver of a continuing consumer shift away from sheep and goat meat is price. Today fresh sheep and goat meat prices are 68 NIS per Kg (50 NIS per Kg in Gaza); frozen beef costs 23 NIS per Kg. In 2010 fresh chicken was 17 NIS per Kg.

Although total cash expenditure per capita has been increasing (141 JD per month in 2009 against 100 JD per month in 2004), this is mainly a consequence of an increase in consumer prices (30% increase from 2004 to 2009). Tight household budgets continue to pressure consumers to switch to lower cost meats.

This study focused on meat. However, it is recognised that for many sheep and goat producers the benefits derived from milk and milk products are equivalent to those derived from meat. The total annual value of each of these two production streams is estimated at some US\$ 90 million. Interventions aimed to increase the efficiency of meat production will go a long way to resolving the bottlenecks constraining the productivity and profitability of sheep and goat milk, and their value-added products (primarily yogurt and cheese) that are processed at the household level. In addition to expanding local informal market sales of

these products, there is potential to link this dairy sub-sector with industrial milk processing plants. More research is needed to understand the current situation of this sub-sector, its specific bottlenecks, and to identify and quantify the opportunity for development.

Supply:

Sheep and goat production is now practised by some 20,000 oPt households. Production is widespread geographically, but is somewhat concentrated in Hebron, Jenin, Nablus and Bethlehem. Most of the sheep are raised in Hebron (33%), Jenin (18%) and Nablus (13%), as depicted in Figure 7.3. Traditional breeds predominate – the dominant prominent breed is the local sheep (Awassi, at 95% of the herd), followed by the Assaf breed (4%).

Hebron hosts the largest numbers of goats (28%), followed by Jenin (16%), and Bethlehem (15%). Around 90% of the goats are of local breed, and 3% are Shami goats.

Small herders account for some 80-85% of total animal numbers. These herds typically are managed by family members, especially by women and children. Milk and dairy products often figure prominently in these household diets and budgets: important to family livelihoods, improving liquidity, stabilizing income and consumption and as a form of savings. Some producers are quite small-scale operations. According to PCBS, in 2005 goat holdings with less than 5 animals accounted for 15% of total goat holdings, and sheep holdings with less than 10 animals accounted for 26% of all sheep holdings

While it is well-known that women play a very active role in small ruminant care, most sheep and goat farmers are reported as male (95%); with about 88% of them are married. More than 50% of these small ruminant farmers are between 40 and 64 years of age, and about 25% do not have any kind of formal education.

Interestingly, most of oPt's sheep and goat producers are part-time farmers and are engaged in other types of occupations as well. About 27% are workers, 9% employees and 20% were unemployed. Full-time farmers are only 32% of the total number of sheep and goat producers.

In 2010, there were reportedly some 564,000 sheep and 229,000 goats in the West Bank and Gaza. These animals are raised on oPt's 14,000 animal holdings and 17,000 mixed farm holdings. There is no contradiction in saying that sheep and goats are raised by 20,000 households -- according to official figures from 2005, 56.6% of the animal and mixed holdings had sheep and goats only, and 34% raised a wider mixture of types of livestock. Total sheep and goat herd sizes are both at or near 15-year lows. The household survey referenced re dairy²⁴, found that while only 1 of the approx. 70 households had cattle, while on the order of 10 held sheep and/or goats.

²⁴ The 2010 *Integrated Report for The Palestinian Agro-Production and Marketing System (Case Study of the Northeast Jordan Valley Area)*, by ARI and ACF

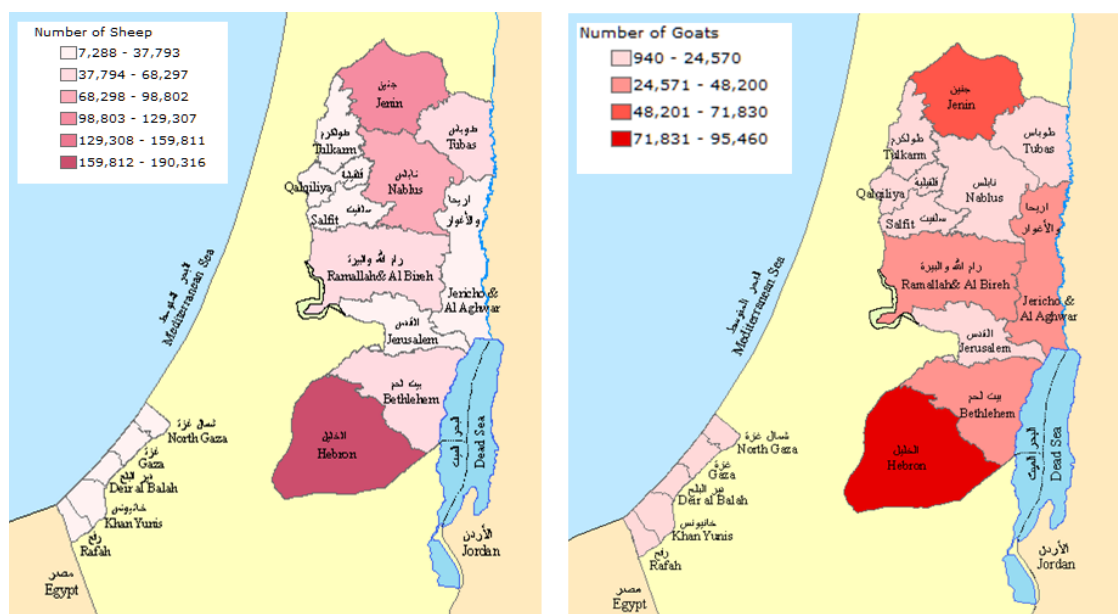
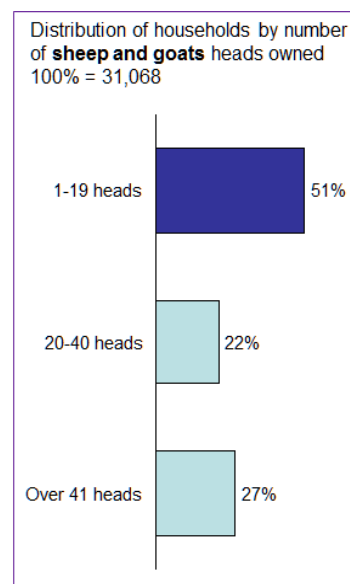


Figure 7.3 – Distribution of sheep and goat animals in oPt

While there is much room to debate the details of both past and current sheep and goat herd numbers, both official and other estimates, it is consistently reported by agriculture experts that the number of animals continues to decrease, following a sharp falloff of some 20% between 2007 and 2009.

There are three basic production systems in use: extensive, semi-intensive and intensive. These are distinguished primarily by their differential use of purchased feeds and other inputs. Small herders (fewer than 20 animals) predominate under all three production models. Medium and larger-scale producers tend to use semi-intensive or intensive production models. The herd split between the extensive model and the other systems is approximately 25:75.

Approximately 200,000 sheep and goats (25% of the national herd) are currently managed under the extensive production system, mostly raised by small herders. While on the decline, this system is still common in the eastern slopes of West Bank and Bedouin areas, and is characterised by free and open rangeland (with animals travelling from one grazing site to another) and by low and seasonally uneven productivity. Under this system, at least 30% of feed requirements are satisfied by rangeland and grazing of crop residues. Since 2007, rising input prices (especially of fodder) and reduction in available grazing areas and increasing difficulties with water access have been major factors in the decline in the number of animals raised under this system. For those remaining, it is reported that with a proven value proposition, and provided necessary services and resources are available, most would be willing to move to a semi-intensive production system.



The intensive model is common in the north of West Bank, and is characterised by good production practises: raising the animals in stall-fed farming under good management, with use of concentrate and forage feeds (at least 80% of it imported), while making use of a short grazing season when available. A significant proportion of medium and large producers (more than 20 animals), as well as some non-farming private investors, use this system.

Semi-intensive producers fall in between the two other systems in their use of purchased inputs and improved husbandry practises. It is the prevalent model in oPt, albeit it varies in its details from farm to farm. Under this system, typically only 15% - 20% of feed requirements are satisfied by rangeland and crop residue grazing.

Around 595,000 animals (75% of the total) are reportedly managed under intensive and semi-intensive production systems. Of these, 80% (476,000) are reportedly being raised by small herders. The large majority of these small operations are managed by family members, typically by women and children. For these households, sheep and goats serve multiple functions: they are kept to improve liquidity, stabilise income and consumption, and as a means of storing wealth. Women tend to be especially involved in animal feeding and cleaning sheds.

According to (Union, 2011), there are 76 cooperatives involved in livestock in oPt, the majority of them in sheep and goat raising. The great majority of them only provide input services to their members (mainly feed), who usually larger producers using the semi-intensive model of production.

Available data re production and offtake levels at best paint a blurred picture. Official figures for 2008 report that sheep and goat meat production was 26,300 tonnes, 75% of which was sheep meat. However, this figure is deemed substantially too high -- to produce 26,300 tonnes in one year, between 800,000 and 1,300,000 animals would have had to be slaughtered, equal to the approximate number of the entire oPt herd. Figures from the Arab Organisation for Agriculture Development (AOAD) point to 13,800 tonnes of sheep and goat meat production. This latter figure, while still high, is more reasonable.

The study also recognised the weakness of published official 2008 off-take ratios²⁵ in the West Bank (no data available for Gaza), which were 4.0% for sheep and 1.1% for goats. Among other shortcomings, they only account for the animals slaughtered at the 6 official slaughter houses, and do not include the slaughtering at the household or butcher shop level, which is far more common.

There was found far more agreement within available statistics on animal mortality. Mortality rates are high, at around 10-20%. Over 60% of cases of post-natal mortality occur during the first two weeks after birth, with the percentage decreasing significantly afterwards. Producers do what they can to use veterinary drugs to prevent and treat illnesses in their herds. This is explored further in the following section

While there are cases where herders slaughter the animals at their own household, the common scenario is for them to sell live animals. As depicted in the market map figure above, there are four main channels sheep and goat producers use to sell their animals:

- Palestinian middlemen. This is the most common situation, with the middleman buying the animals at the farm gate, and selling them to the wholesale market
- Butcher. These are stores specialised in selling meat (including poultry). They are usually small, with exceptions being medium size butchers inside supermarkets in Ramallah, and some independent larger butchers that supply smaller shops. The cold storage is adequate, but they have little control over the quality of the animals they slaughter.
- Fatteners. The farmer sells the weaners at 3-4 months of age to fatteners who usually keep the animal until it reaches 6-7 months of age and 70 Kg in the case of sheep, or 5-6 months of age and 45 Kg in the case of goats. When the time comes for fatteners

²⁵ Number of animals slaughtered divided by total stock of animals

to sell the animals, they sell to a local middleman and, to a lesser extent, directly to the wholesale market. Typically, fattening leads to increased profitability of the animal from 171 NIS to 247 NIS (in the case of sheep), and from 167 NIS to 209 NIS (in the case of goats). More than 50% of extensive producers sell their animals to fatteners, whereas the majority of intensive and semi-intensive producers fatten the animals themselves.

- Wholesale market. In this situation, the farmer sells directly to the wholesale market. It is important to note that an important percentage of weaners go to the wholesale market (either directly or through a local middleman), without any fattening.

From the wholesale market (which typically claims a margin of 3%-5%), most animals are bought by butcher shops. These shops either slaughter the animals themselves (most common situation), or hire the services of an official abattoir. Butchers generally sell directly to consumers, though a small amount makes its way to supermarkets. Butchers usually make a profit of 15%-20%.

Usually the animals slaughtered in official abattoirs supply urban demand. There are 4 slaughtering houses in the West Bank, and 2 in Gaza; these currently operate at well under capacity (10%-40%). 30 NIS are charged per head.

There is some level of vertical integration along the chain, as:

- most of the semi-intensive and intensive producers do weaning and fattening
- some butchers are also sheep and goat fatteners
- some producers slaughter and retail the meat at their households.

Below is the distribution of value added along the most typical channel of the value chain. Prices are NIS per Kg of fresh meat sold to the consumer.

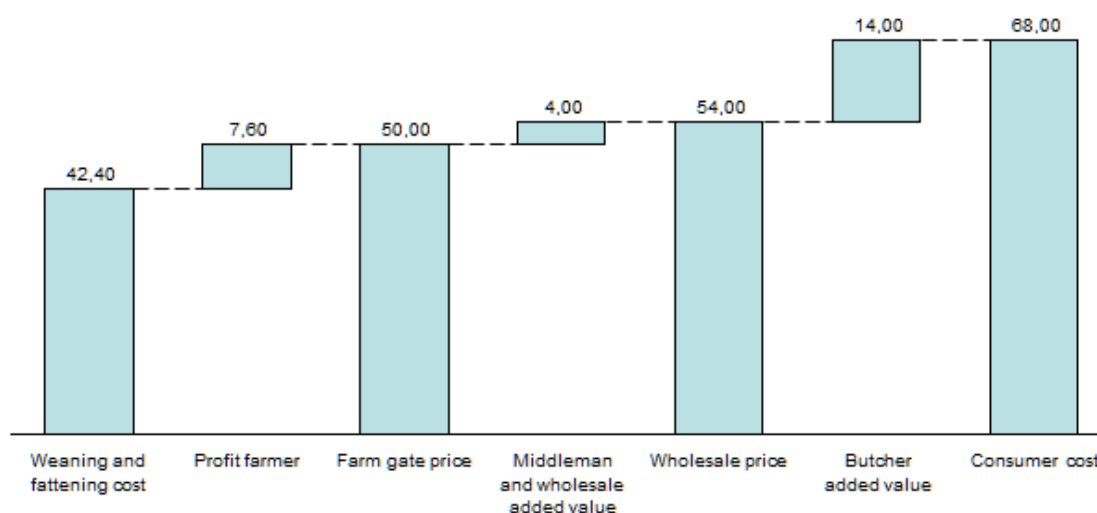


Figure 7.4 – Prices and added value along the sheep and goat value chain

Usually the animals are owned by men, and women have little control over the income generated by animal sales. While women do most of the milking and may process milk into value-added dairy products, they rarely have significant control over the income derived from the marketing of milk or dairy products.

Overall, women typically play only a minor role in marketing (especially in urban areas). When they do engage they generally prefer to sell their products closer to their households, even though that may mean accepting a comparatively low price. While some women's cooperatives do exist, there appears little sense of empowerment among their members.

The following table shows the differences between the West Bank and Gaza:

Areas of Difference		West Bank	Gaza
Producer Access to Inputs	Land issues – e.g. % producers using extensive production system	50 to 60%	15%
	Feed/Forage	15%	15%
	Concentrates	Yes (85% of animal feed)	100%
	Medicines	yes	yes
	Young stock	yes	yes
	Artificial Insemination	yes	yes
Slaughtering Infrastructure (# major abattoirs)		6	2
Capacity of Farmer Organizations	No. Organizations & Members	52 cooperatives; 13000 to 14000 farmers	n/a
	Collective Marketing	no	no
	Access to Credit	no	no
	Access to Inputs	yes (some cooperatives)	no
Main Products and Markets	Sheep & Goat Meat	15,000 tons per year	1,500 tons per year
	Sheep and Goat milk & milk products	24,000 tons; cheese and jameed (solid labaneh)	Small quantity (unclear)

7.4 Constraints

Many of the key constraints to oPt's sheep and goats sub-sector are not unique to it. They include broader agricultural sector issues of:

- Limited local availability of water of suitable quantity and quality
- Limited access to needed finance – this is exacerbated in the case of many smallholder herders because of their traditional approach to the activity, their increasing dependence on purchased feed and water (especially for herders in Area C), and their related hesitancy to assume debt
- Lack of capable and effective farmer organisations
- Limited public and/or private extension services

These issues are discussed in the chapter, “Cross-cutting Recommendations”, below.

The major challenges specifically facing oPt's sheep and goat producers and prospects for improving the sub-sector may be considered as fitting within three “buckets”:

- 1) Poor husbandry and management skills

- 2) Limited access to high quality inputs
- 3) Poor marketing, slaughtering and retail practises

The following figure provides a schematic overview.

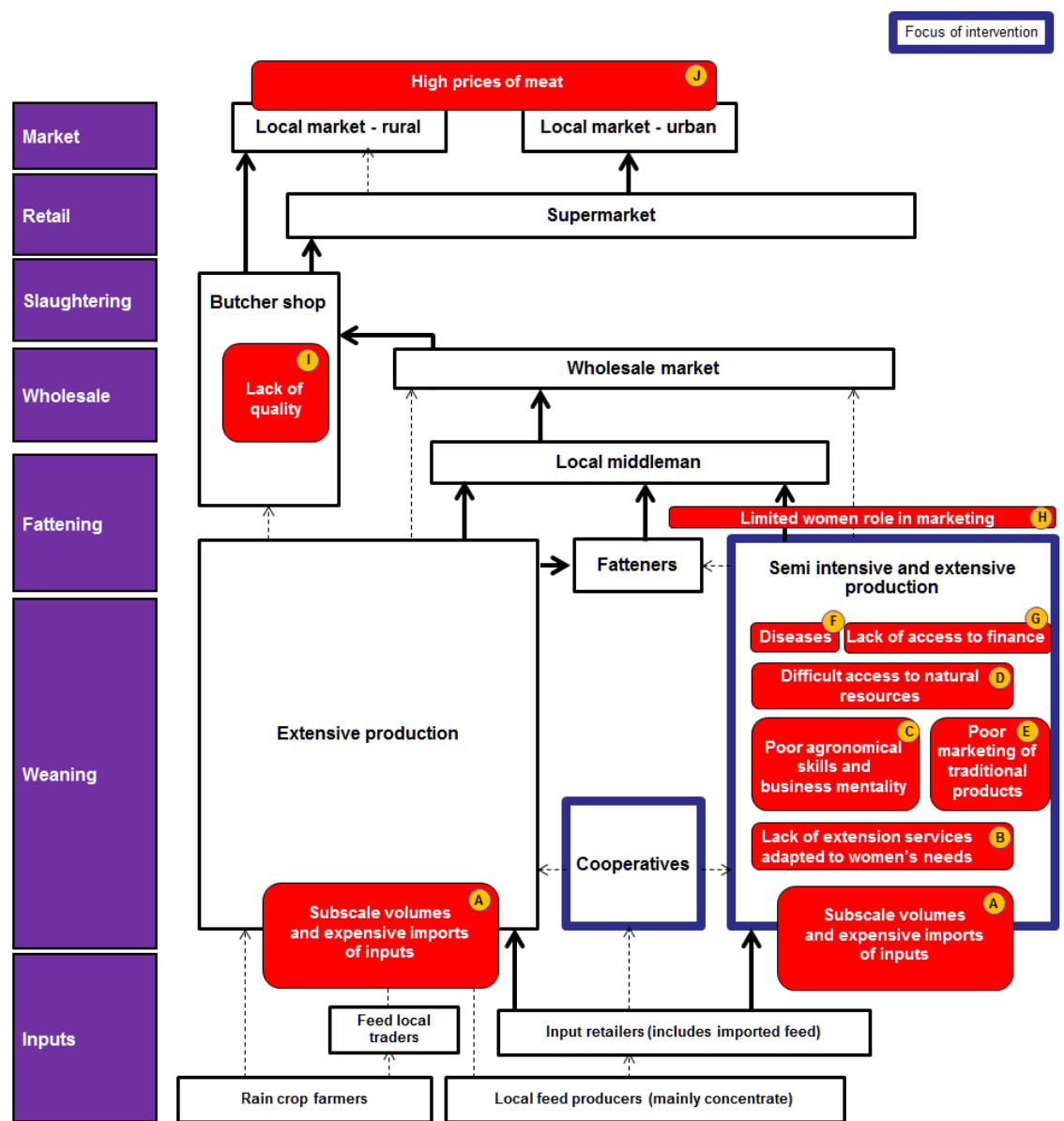


Figure 7.5 – Bottlenecks affecting the sheep and goats sector

A – Expensive inputs

Small-scale producers experience difficulties buying good quality feed and veterinary inputs at reasonable prices. A major contributor to this is that they make rather small purchases, for which they have little choice but to pay a premium price, with little assurance of receiving a quality product. An important benefit of well-functioning farmer organisations can be their ability to aggregate smallholder purchasing power and negotiate better prices for quality products.

Feed purchases make up the highest portion of production expenses. Purchased feeds (and/or grazing rights) are significant cost factors for all but the most traditional herders. In intensive

production systems they typically account for 60-70%, or more, of total cash production costs. Purchased feeds used for sheep and goats generally consist of a protein mixture (priced from 1,6 to 2,0 NIS per Kg, depending on quality and volumes) and wheat (priced from 1,0 to 1,4 NIS per Kg). Local feed production is primarily based on barley, which is mainly produced under rainfed conditions in Hebron and Jenin. In 2008 113,000 tonnes of barley were reported produced. However -- almost all feeds and feed materials -- estimates range from 80 – 95% -- are imported via Israel. Palestinian dealers import directly to their feed mills and sell to urban-based traders who on sell to the farmers.

Veterinary medicines are usually imported by local dealers, who sell in local shops to farmers. Available information says smaller farmers (those who raise up to 50 heads of sheep and goats) spend an average of 52 NIS per head on medicines, while larger producers spend 28 NIS.

In addition, as a further consequence of the limited access to traditional rangelands, especially in area C, small extensive herders are increasingly reliant on purchasing water from distant filling points and also having to pay for the associated transportation costs.²⁶

B & C - Poor husbandry and management skills

For the most part oPt's small ruminant farmers have poor technical and herd management skills (poor feeding and animal husbandry) and limited business knowledge or orientation.

Traditions run deep in small-scale production, and are reflected in the use of sub-optimum breeds and breeding and husbandry practises. These practises reflect a history of risk-aversion, lack of farmer organisations, and poor three-way communication among producers, extension and research. Farmers who lack the skills to understand and practise "farming as a business" may readily adopt modern veterinary medicines, but most need training if they are to understand and accept the strong business cases for changing traditional production practises.

Extension services, especially those appropriate to women's needs, are limited. They have little current capacity to build smallholders' technical or commercial capacities. Reaching women is problematic -- there appears a strong preference for women to receive extension services from other women, but the large majority of extension officers and veterinarians are male.

When feed prices are good and money is available small producers try to feed their herds adequately. But when faced with cash constraints (or unattractive prices) producers have a limited range of choices. According to (WFP, Food Security and Nutrition Survey of Herding Communities In Area C, 2010, p. 17) and (Horizon, 2009, p. 28) their responses are typically to:

- Feed less. As an immediate response to high prices of fodder, farmers will reduce the amount of feed they give to their sheep or goats, so that they keep spending the same amount of money on feed. There is also a tendency for farmers to switch to low quality feed with lower prices.

3. ²⁶ "Household Economic Approach: Occupied Palestinian Territory: West Bank 'Area C' Herders Livelihood Baselines", **EC/Oxfam/FEG Consulting**, October 2011

- Overgraze. Herders try to get the most out of the reachable grazing areas as a means to reduce the use of the purchased fodder, with very little regard for the negative impact of such practises on the environment and sustainability. Some farmers also tend to graze the animals on different horticulture crops like grapes, olives, etc., which can be detrimental to the future season for those crops.
- Shift to low-cost fodder. To reduce high dependency on imported feed farmers tend to use low cost fodders like the residues of tomatoes, or cucumbers.
- Sell part of the herd. Either to get additional income or to reduce operating costs, herders sell part of their herds -- especially the lambs and kids soon after lambing – while retaining the ewes for their milk as a source of income
- Spend less on medical care and education. Household expenses such as medical care and education are reduced to minimise outlay. Apart from the obvious social hardships that this implies, such behavior can have negative impacts on family and farm productivity and the potential for future growth.

These choices, and the rationales behind them, while circumstantially rational, reflect questionable technical and/or commercial decision-making. Training and improved access to goods and services can expand these options and producer and household capacity to make good decisions.

D - Limited access to Natural Resources

Access to open rangeland for grazing continues to decrease and is, of course, most problematic for producers using an extensive production model. The final sub-section of this chapter, on recommendations, addresses this issue and the problems of access to water.

E, I & J - Poor marketing, slaughtering and retail practises

There are three components to this issue: the poor marketing habits of sheep and goat producers, the poor technical practises of butchers, and the poor commercial practises of butchers.

As depicted in the marketing map figure above, most sheep and goat producers, especially the smaller ones, sell their production as live animals to either middlemen or fatteners. They in turn sell to local butcher shops; these are the primary slaughterers, dressers and sellers of retail meat cuts. Individual farmers, especially the smaller ones who have no organisational affiliations, have limited insight into market dynamics and price trends. The existence and level of collusion among the middlemen to maintain low farm-gate prices is not clear and would benefit from further investigation.

Most extensive producers sell their animals immediately after weaning, reportedly when the animal is 90-120 days old and their liveweight is: sheep - 30-40 Kg; goats – 30 Kg. Some of these get butchered; some get fattened. It is more common among semi-intensive and intensive producers (compared to the extensive production model) to keep their animals longer, effectively integrating downstream into fattening in order to add value, and earn a higher margin per animal.

Nonetheless overall, due to the challenges in access to finance for working capital, as well as concerns about the risks of disease leading to high mortality rates, the smaller farmers do not hold on to their animals as long as would be economically optimal from a business perspective (see more details below under Opportunities).

Slaughtering and butchering practises by the many small butcher shops of course vary, but not very much. While refrigeration is widely used, there remain issues of hygiene and food safety throughout the slaughtering and butchering processes used by many shops.

Local butchers, the dominant retailers, appear to take a conservative approach to their selling. Product pricing in particular is seen as problematic, with retailers showing little flexibility or creativity in their pricing practises to maximise either their sales or profits. They appear to try to maintain steady prices, at least in the short to medium-term, though their purchase prices vary.

There is weak marketing capacity, even within existing cooperatives, for the dairy products women produce from sheep and goat milk (yogurt, cheese). There is also reportedly a reluctance of consumers to buy local dairy products, especially given the high price.

F - Diseases

Animal health issues for sheep and goats are less problematic than they are for dairy cattle. This is held to stem largely from the reliance on well-adapted multiple use local sheep and goat breeds, vs for example the extensive adoption in oPt of Friesian (Holstein) cattle, a specialised dairy breed from Europe. Nonetheless, there are reportedly new diseases appearing that are unknown to the farmers and there is a lack of affordable private veterinary services to complement the limited public sector capacity.

Experts report that effective training on the management of parasites would likely be the single most effective way to improve herd health. Specific recommendations are made below.

G – Access to finance

Like farmer organisation, this is a key crosscutting issue among oPt smallholders. It has cultural as well as insitutional dimensions. For the most part it should be addressable via farmer aggregation, education, and linkages to microfinance institutions and other sources of credit, e.g. input sellers and service providers.

H – Women’s role in marketing

Gender roles are for the most part strongly defined in rural oPt. This is particularly true in traditional activities such as animal husbandry. Study informants saw the greatest opportunity for women’s engagement in commerce in non-traditional activites. Within this sub-sector, two possibilities stood out: fattening and breeding operations. These, and others, are discussed briefly below.

7.5 Opportunities

Based on the potential to resolve or improve the situation with regard to the sub-sector’s key constraints, we see significant opportunity for increasing sheep and goat productivity and profitability.

oPt per capita consumption of red meat is only 63% of the average in the Arab region (15 Kg per year). Given known consumer preferences, it is reasonable to expect oPt consumption of sheep and goats to increase, if either relative consumer prices go down or purchasing power increases. This is supported by both historical and anecdotal data.

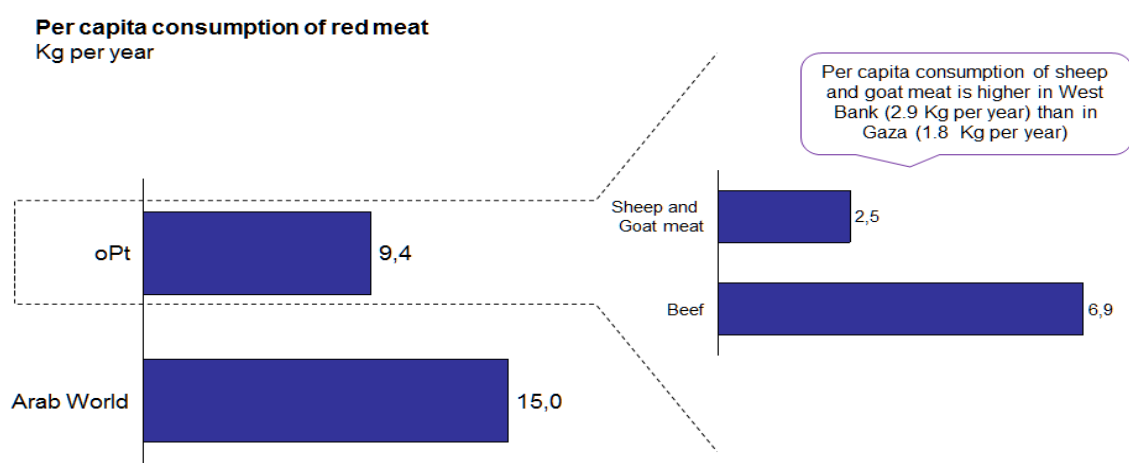


Figure 7.6 – Per capita consumption of red meat

There are two key ways to lower consumer prices: 1) lower per Kg production costs (meaning a focus on feed, which may account for 60%-70% of total production costs, and animal health), and 2) shorten and make more efficient the marketing value chain to enable the producer to capture a greater share of the consumer's buying price. This would include helping the retail market improve its marketing and pricing habits to expand sales and profits.

There is also a specific opportunity to work with women to increase their presence and their role in the sector, especially on sheep and goat dairy products. Programme developers might consider a focused business plan competition to identify high-potential women entrepreneurs – individuals or groups – and support them in upgrading product production, packaging and marketing.

The study team also saw potential for supporting women's groups to establish breeding farms to fill the gap for high-quality ewes/rams and does/bucks. It has been suggested that this activity would be more socially acceptable than women's groups engaging in animal fattening operations. There may also be possibilities for women to engage in some feed production/processing enterprises, e.g. silage production.

Semi-intensive and intensive small farmers represent 80% of the total number of these producers. The following figures depict the potential opportunity for capturing efficiencies by simply growing out at least some animals to a larger size before sale. (The numbers above the columns in the figures are the number of informants, the 'N'. More research is needed into issues of differential pricing based on the meat (and by-products) from different aged animals, seasonality of demand, changes in feed conversion ratio over time, how current production strategies balance meat and milk production, etc.)

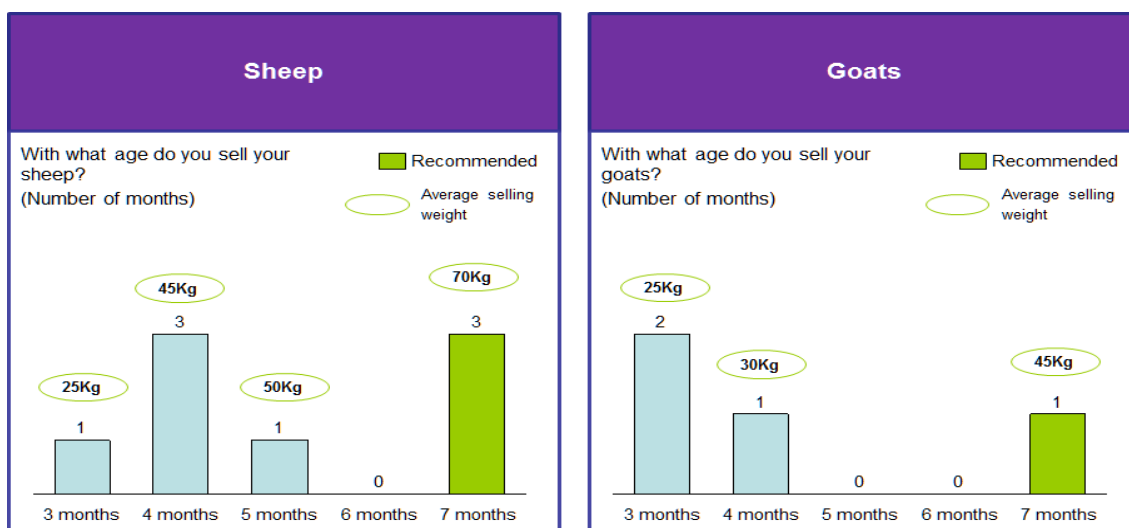


Figure 7.7 – Sheep and goats selling age and weight

Indicative of the potential, however, assuming a flat price per Kg, with nothing else changing, a sheep farmer's profit can increase some 45%, to 247 NIS per animal, if he sells at 65 Kg (after 6-7 months) and improves the mortality rate from 10% to 7%.

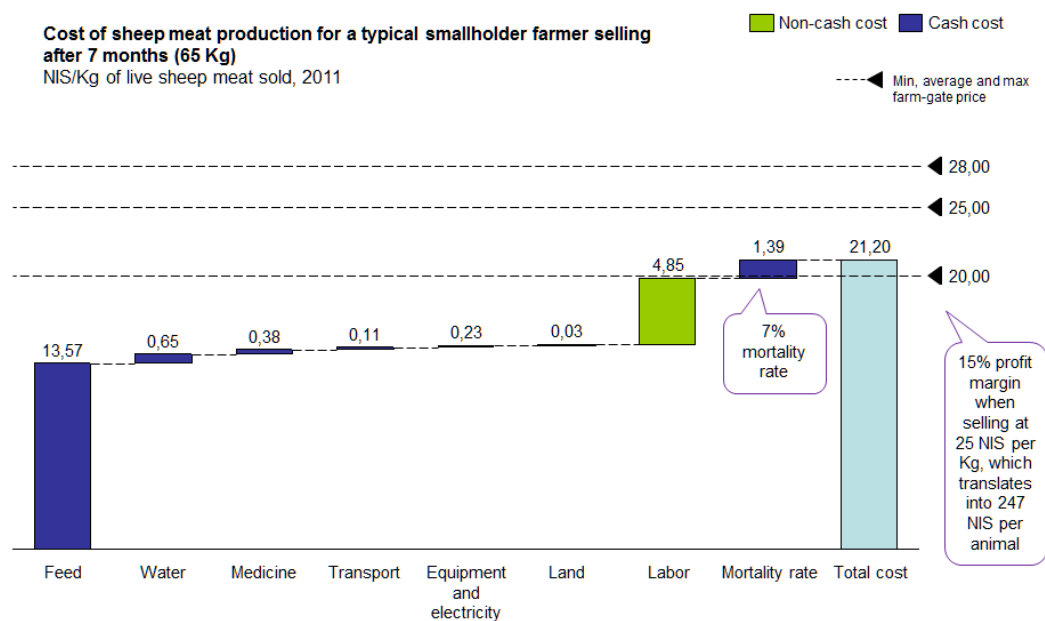


Figure 7.8 – Cost of sheep meat production (7 months)

For a goat producer, with nothing else changing, profits can increase some 25%, to 209 NIS, if the goat is sold at 45 Kg (after 6-7 months) and similarly improves the mortality rate by a third.

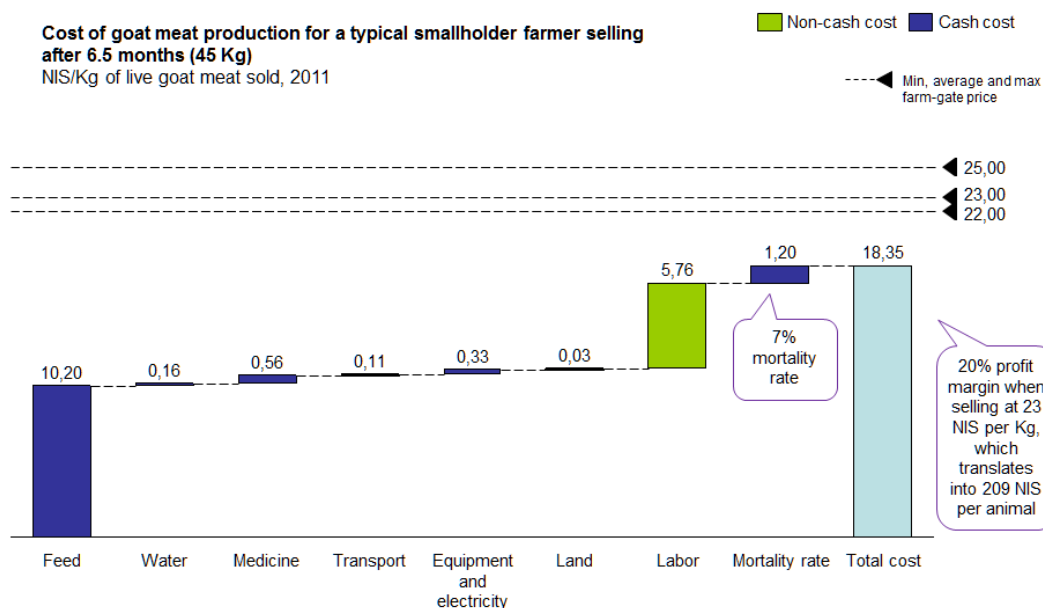


Figure 7.9 – Cost of goat meat production (6.5 months)

There may also be possibilities to target some breeding seasonally in order to take advantage of the heightened demand for young animals around Islamic holidays.

Merely by selling their animals at larger sizes it is expected that oPt sheep and goat producers could easily increase their current level of national production by 15% during the next 5 years. In this regard it is worth noting that the Moroccan National Association of Sheep and Goat Breeders (ANOC) reportedly succeeded in raising slaughter weights by 68% over 2 years in one of their programmes.

Study analysis shows that achievable production efficiencies can drive sheep and goat meat costs of production down by 6-9 NIS/Kg, roughly a 10-15% decrease. Our model based projections, illustrate that over the next five years, there is potential to increase the value of marketed production in the sector by a cumulative \$13.9 million. via expanded production and sales. If achieved, these increases have the potential to benefit 4,000 small-scale sheep and goat farmers (assuming 20% programme participation across the producer community) by an average of \$750 per family per annum in the fifth year. The further development of the small ruminant dairy sub-sector could add to these figures. And if the proposed recommendations get taken up by a larger proportion of the herders and producers, the impact could be significantly higher.

As was mentioned with regard to major processors and the marketing of dairy products, there may also be scope for impact by working with the major abattoirs to develop a positive 'brand' identity for their meat products that would help expand sales of fresh sheep and goat meat. In Mozambique, TechnoServe led an effort that drew together a very fragmented commercial poultry sector and helped them improve operational efficiencies and food safety standards, and launch a successful domestic brand. Over 4 years, 2005 – 2008, demand doubled and the nascent industry grew by some 400% to serve it, successfully regaining market share from imports.

7.6 Recommendations

Recommendations to resolve many of the key constraints facing oPt's sheep and goats sub-sector are made in this report's sections on common and crosscutting issues, including challenges such as: farmer organisation, extension services, limited local availability of adequate and suitable water; limited access to needed finance; and poor access to high-quality appropriately priced inputs.

The key recommendations specific to the sector and building from the above opportunities are:

- Work with butchers, abattoirs, fattening operations and other stakeholders to develop systems and incentives for producers to better orient their production to the market. This is likely to include aspects of seasonal demand and differentiated demand, e.g. for holidays and to suit consumer interest for meat (differentially priced) from both younger and older animals, as well as the advantages of holding onto the animals longer before selling. These same stakeholders can be supported to put in place the improved access to financing needed for additional working capital requirements. To support these efforts, development of appropriate member business organisations (MBOs) for post-production enterprises should be explored.
- Build market-driven incentive systems that will help small farmers understand the advantage of, and proceed to form, primary producer groups of 10-30 farmers to facilitate training, improved gender dynamics and improved access to needed information, inputs and services. Such farmer organisations will help aggregate demand for veterinary supplies and services to improve herd health and reduce mortality. Farmer groups can support getting higher market prices/margins for animal sales by coordinating collection and dissemination of market price information offered by the broad range of relatively small buyers – to introduce effective competition. The large-scale abattoirs may see advantages in supporting this.
- Test and develop market-based systems to expose farmers to and train them in best practises within the semi-intensive model to improve productivity (such as managing water quality and accessing improved feed/fodder). Aggregated demand through strong and expanded producer organisations will incentivise a supply response from private suppliers. Depending on the responsiveness of private sector service providers, a higher level association of producer organisations may be needed to clarify sub-sectoral demand levels to suppliers, or even provide some services itself if private suppliers do not respond.
- To improve feeding practises, and reduce dependence on imports, possibilities should be explored for groups to contract with crop farmers for the production of forage or for quantities of crop residues, e.g. of green wheat straw. Working with these groups a farmer field school approach might be used to encourage the testing and use of innovative practises for fodder production and preparation, such as supplemental irrigation of small plots of forage crops, use of drought-resistant forage crops, the planting of fodder trees, and silage preparation. Some of these practises might fit well and positively complement ongoing farming practises by better maintaining soil moisture and fertility, and reducing erosion. And some may be suitable to be developed as enterprises by women's groups. More broadly, import substitution of barley production should be encouraged. This will need to be explored further as prices of imported barley seeds are currently 20% higher than international markets due to Israeli set import duties.
- Increase women's presence and role, especially on processing sheep and goat dairy products. A focused business plan competition might identify high-potential women entrepreneurs – individuals or groups – and support them in up-grading product

production, packaging and marketing. Women's groups might be incentivised and supported to establish breeding farms to fill the gap for high-quality ewes/rams and does/bucks, or develop enterprises to support improved feeding, such as silage production.

- Explore the feasibility of developing a positive 'brand' identity for the major abattoirs' sheep and goat meat products, and ideally linking in any nascent MBO formed by the smaller butcherries, to expand sales of fresh sheep and goat meat. Such a 'brand' mark could also be a way of ensuring other positive practises, including health practises, are adopted to "earn the right" to use and maintain use of the brand mark.
- Support strengthening private service providers, and the MinAg to respond to the clearer demand and improve control of the health of imported livestock, a frequent source of disease.

More specifically, with regard to disease management, the following activities would mitigate the negative impact of diseases on sheep and goats and reduce mortality:

- Educate farmers regarding the economic losses caused by diseases, and build their capacity in diagnosis and treatment
- Provide training in preventive measures to reduce the incidence of diseases, e.g. sanitation of animal housing
- Support the Ministry of Agriculture and other service providers in providing ongoing training of veterinarians
- Implement an approach to disease management at the group and regional level
- Implement measures to reduce the importation of uncertified, uninspected sheep and goats into oPt

The Veterinary Department of the Ministry of Agriculture should take the lead in the implementation of these activities. Ongoing support can be sought from: the Spanish Agency for International Development Cooperation (AECID) and UNDP, which collaborated in the recently ended 10-year brucellosis control programme; and the FAO and the EU, which are working on preventing and mitigating the impact of sheep and goat diseases.

A broad range of actors are required to change their behaviour to implement these recommendations overall, including: abattoirs and butcherries, feed and fodder producers, the Ministry of Agriculture and the farmers themselves and their organisations. Given the lack of large players who can coordinate the changes within their supply and market chains to demonstrate the improved practises, a mechanism, such as sectoral steering committee or council would likely be a useful addition to the web of organisations that will need to act differently.

Access to grazing land:

While it is diminishing in importance, one out of four of oPt's sheep and goat producers still essentially use an extensive production system. Semi-intensive producers also depend on access to grazing, albeit to a lesser degree. They share the key constraint of decreasing access to grazing land. And in their cases it is closely related to water access issues (see textbox below).

While it is not seen as a priority for sub-sector development, securing access to rangelands is

Water issues are most severe in the extensive production system. According to (28 p. 22), more than 73% of herders in area C reported difficulties accessing water. Due to recent drought conditions 80 percent said water prices had increased over the previous six months. Communities unconnected to water networks (47% in Area C) generally pay very high prices for water, typically four times more than network water, and usually of inferior quality.

important for those who either cannot afford or choose not to move to a semi-intensive model – such as Bedouins. In Area C income from livestock often accounts for some 60% of total household income, with income from milk and milk products adding an additional 10-20%.²⁷ Addressing rangeland issues would involve:

- Advocacy for Bedouins to have improved access to rangelands, including:
 - Building a consensus for change across those Palestinian and Israeli organisations, especially in the private sector, that are eager to promote the development of the Palestinian agriculture sector
 - Identification of specific restricted rangeland areas where improved rights and access are needed for specific projects and development of strong business cases as to its necessity and who it will benefit, and how to mitigate any risks to Israel
 - Involving the Office of the Quartet Representative in these issues
- Facilitating the design and implementation of CBNRM rangeland protection, so that overgrazing (one of the main causes of rangeland desertification) is avoided. It would be important to develop community and user understanding of the carrying capacity of the rangelands in different geographies, and work with them to manage their use based on that capacity.
- Rehabilitation of the pastures and increasing their carrying capacity
 - Increasing water harvesting and water spreading in the rangelands
 - Promoting the planting/propagation of beneficial native shrubs
- Facilitating and promoting cooperation between herders in the collective management of the grazing activity of their herds

To accomplish these changes, a range of local actors supported by international NGOs and specialists would need to lead advocacy efforts on rangeland rights. The Ministry of Agriculture is best placed to take the lead in implementation; it has experience in rangeland rehabilitation programmes. The Ministry of Environment could bring to bear its experience in rangeland protection and combating desertification. Likely sources of support might include the EU, Swiss Development Cooperation, Italian Cooperation, FAO, and the GEF/UNDP, which have all been engaged in similar programmes.

The following figure lists the key recommendations/interventions (both cross-cutting and specific) that will have the greatest positive impact in the sheep and goat sector, the recommended key actors, the time horizon for success, critical connections, and a general rating of the risk.

#	Recommendation	Key	Timing	Co-dependencies	Risk of failure
1	Improve access to finance +	MFI, input and service providers PNA +	Short-term	-	Medium

²⁷ Household Economic Approach: Occupied Palestinian Territory: West Bank 'Area C' Herders Livelihood Baselines. October 2011

	Improve access to water + Improve extension services and training + Improve farmer organisation + Improve disease management	Palestinian Water Authority Min. Agr, input and service providers Mins. Agr and Labour, NGOs Service providers, Min Agr			
2	Strengthen market regulations	PNA, PSI, MBOs	Short-term	-	Medium
3	Improve access to markets and inputs information	MBOs, Telecoms, Farmer orgs	Medium - term	Improve farmer organisation + Improve agriculture information	Low
4	Improve agriculture information	PCBS, service providers, MBOs	Medium - term	-	Low
5	Increase access to land	Ministry of Agriculture	Short-term	-	Medium

Figure 7.10 – Overview of the recommendations for the sheep and goats sector

The following two figures map these recommendations to the projected potential benefits that could flow from these interventions.

Sheep meat, NIS

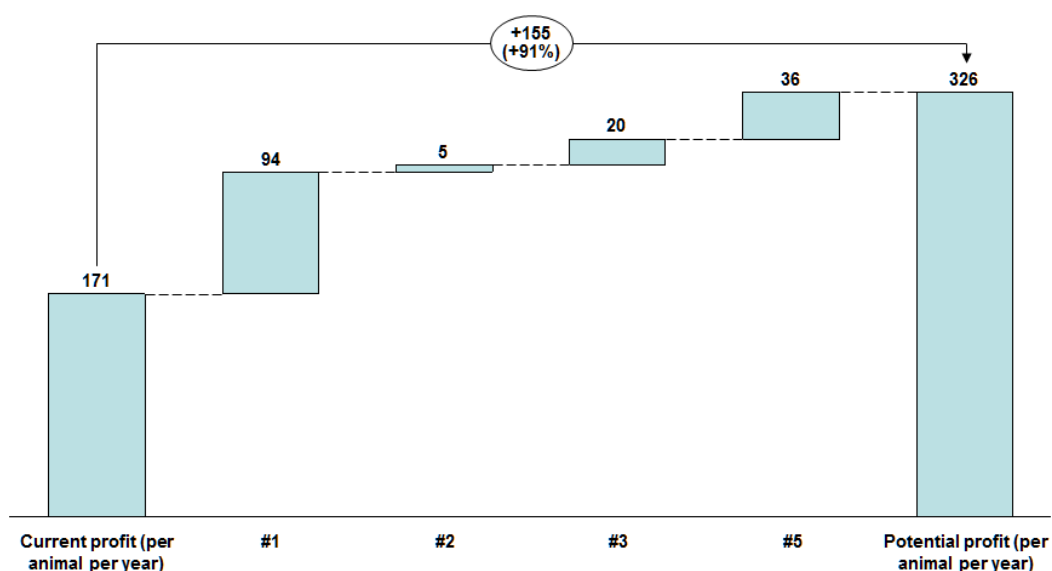


Figure 7.11

Goat meat, NIS

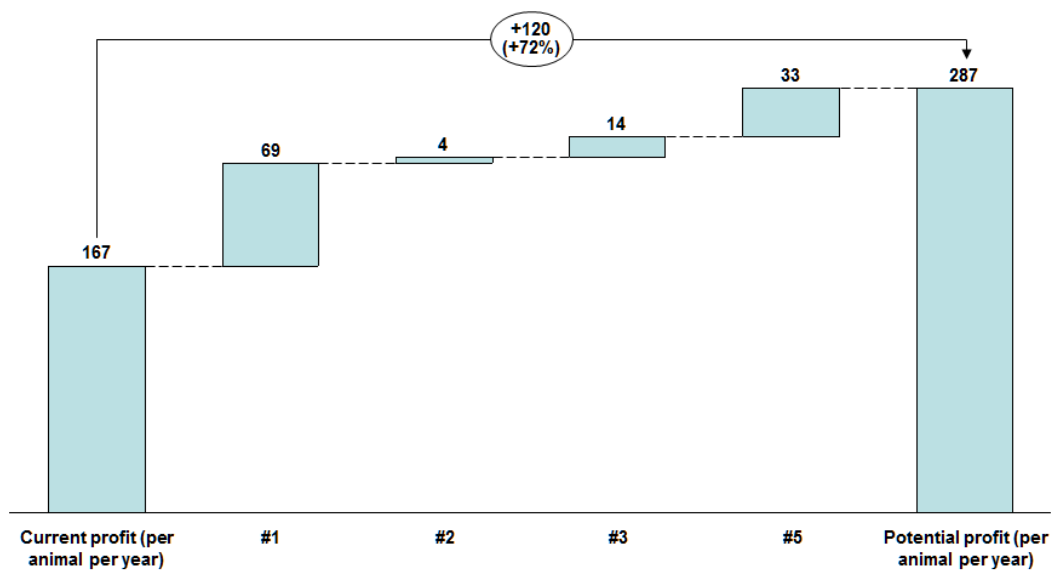


Figure 7.12

8. Olive Sub-sector

This Chapter presents the findings of the team's brief treatment of the oPt Olive sector.

8.1 Current situation market map and support to date

Figure 1 depicts the current market map for olives in oPt.

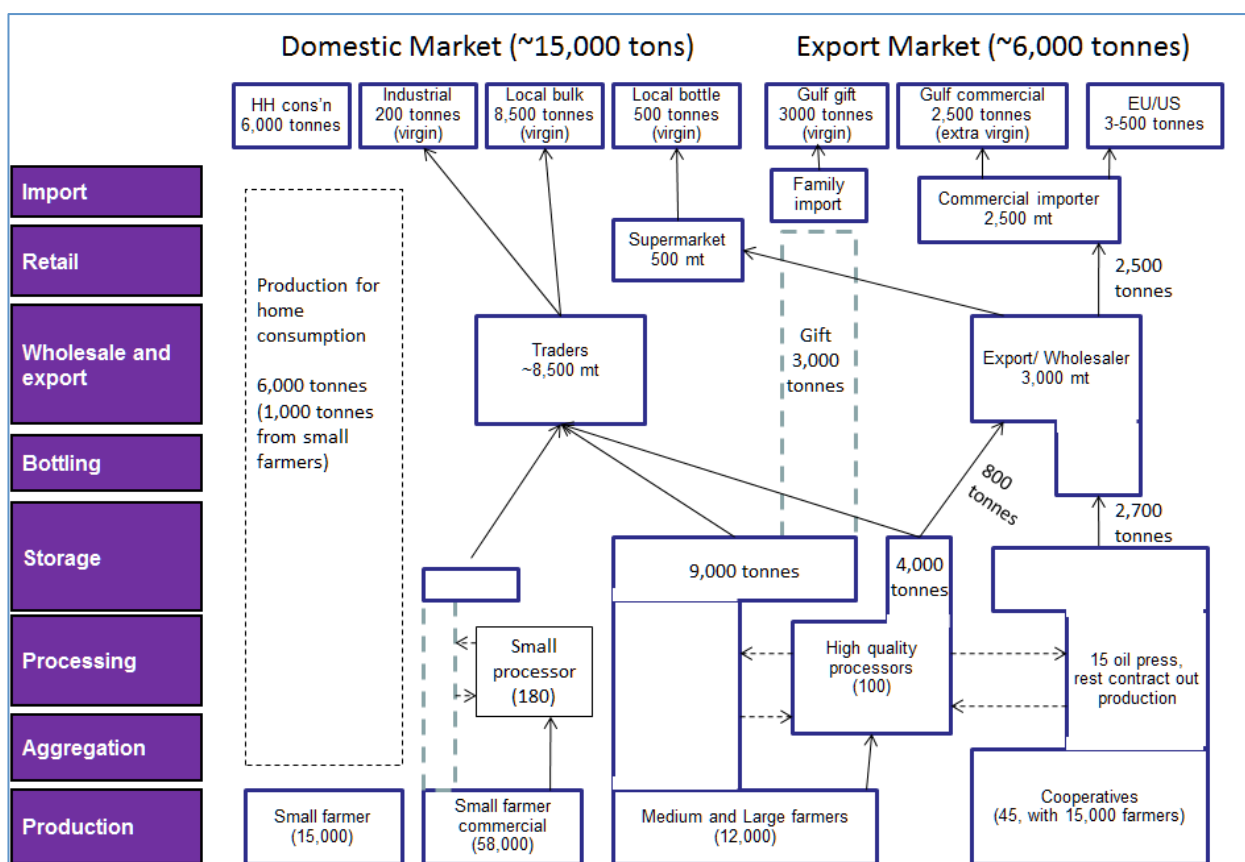


Figure 8.1

8.2 Support to date

The olive sector has received significant support in recent years, along the entire value chain:

- On production, support has been given for:
 - research on pruning, and orchard pest and disease management
 - technical package preparation, field trials, and training and extension;
 - introduction of water harvesting cisterns for supplemental irrigation;
 - farmer organisation.

These activities have produced some improvement in orchard management practises and fruit quality. However, the support was given to a minority of farmers; there has been little improvement

in productivity; farmers are still relatively unorganised and lacking in business acuity and skills; and there are still serious incidences of olive fruit fly damage and Peacock Eye disease.

- On harvesting, post-harvesting and processing, support has been given for:
 - training in improved olive harvesting, handling and transport, and in process management;
 - building new, large and efficient olive presses;
 - improving quality control;
 - improving packaging.

These activities too have had positive outcomes – the new olive presses in particular are working well and at significant capacity. However, poor harvest and post-harvest practises are still contributing to quality problems, and in addition farmers' access to olive presses is hampered by poor quality feeder roads.

- On marketing, support has been given for:
 - exporter exposure to international fairs and introductions to international buyers;
 - product promotions including entering Palestinian olive oil in international competitions and expositions.

These activities have had positive outcomes as well (e.g., Palestinian Extra Virgin Oil (PEVO) won a major competition in Italy). However, despite gaining an award, PEVO is still plagued by inconsistent quality and inadequate supply volumes, and is too expensive for most export consumers.

Finally, there has been relatively little effort to promote and build a production base for olive fruit exports

8.3 Opportunities Still to be Realised

The olive sector has been identified as a promising sector due to the potential to:

- increase local demand,
- increase exports, and
- increase the production of olive products other than oil.

Given current low yields and underutilisation of processing capacity, this can all be supported without requiring an increase in cultivated area or processing capacity.

Increase local demand

Current domestic demand of olive oil is estimated at 15,000 tonnes per year, or per capita consumption of ~4 kg per year (see Figure 8.2 below). Per capita consumption is markedly lower than 1985 levels of around 10 Kg per capita. This drop is reportedly due to olive oil's lower affordability due to decreased household purchasing power and high prices caused by poor harvests. Since 1996, the per capita consumption has dropped slightly, as shown in Figure 8.2. If prices were improved (by decreasing cost of production) there is good reason to expect volumes to increase.

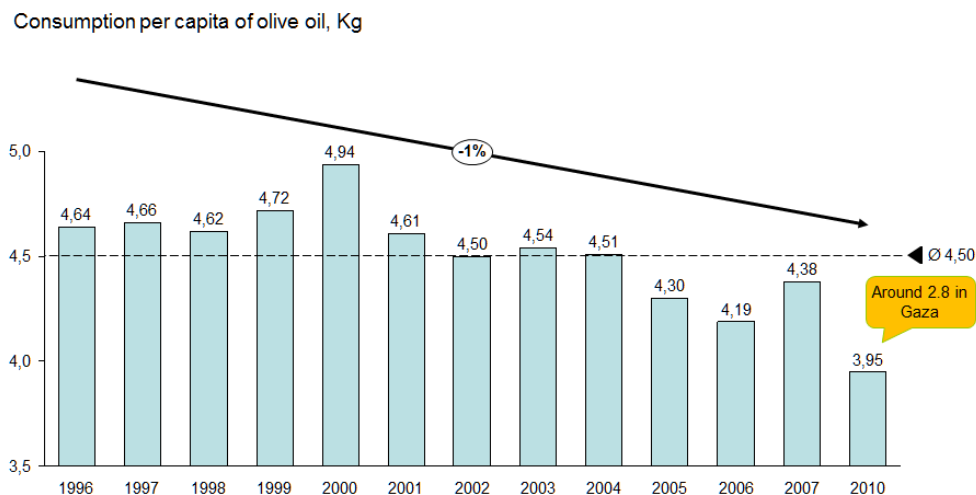


Figure 8.2

Increase exports

oPt can potentially target international markets with its extra virgin olive oil. USA, Malaysia, Japan, China, Europe, and the Gulf are reportedly attractive markets for extra virgin and premium extra virgin oil. According to the International Olive Oil Council (IOC) Palestinian olive varieties have strong potential to produce high quality olive oil, due to their very specific aromatic and taste features.

Despite this reported potential, exports of olive oil have remained low and relatively stagnant over the last few years, as depicted in Figure 8.3.

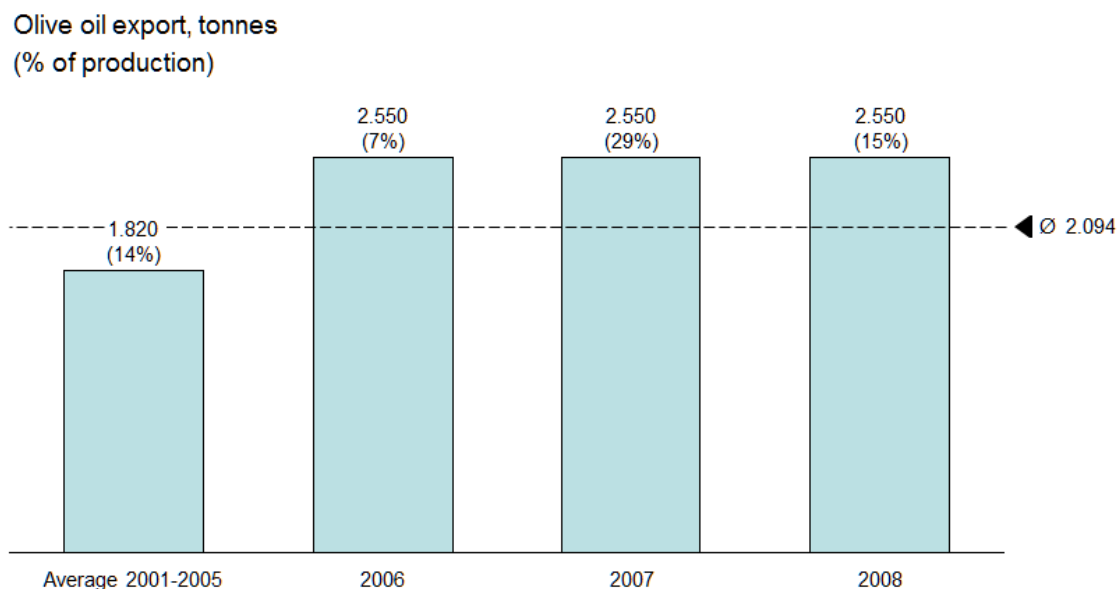


Figure 8.3 – Exports of olive oil from oPt, 2001-2008

Intensification of production of olive products other than oil

According to discussions with olive experts in oPt, there are certain products that may have export potential, besides olive oil. Tapenade, pickled olives, and olive paste are examples of such products. Recently, a company in the West Bank started to export tapenade.

Increase domestic olive production

The available olive orchards and processing industry is capable of increasing production to meet opportunities to supply increasing domestic demand, exports, and production of other olive products.

Average olive production from 2000 to 2009 was 74,000 tonnes per year (Figure 8.4), the majority of it (95%) converted into an average of 17,000 tonnes of olive oil per year.

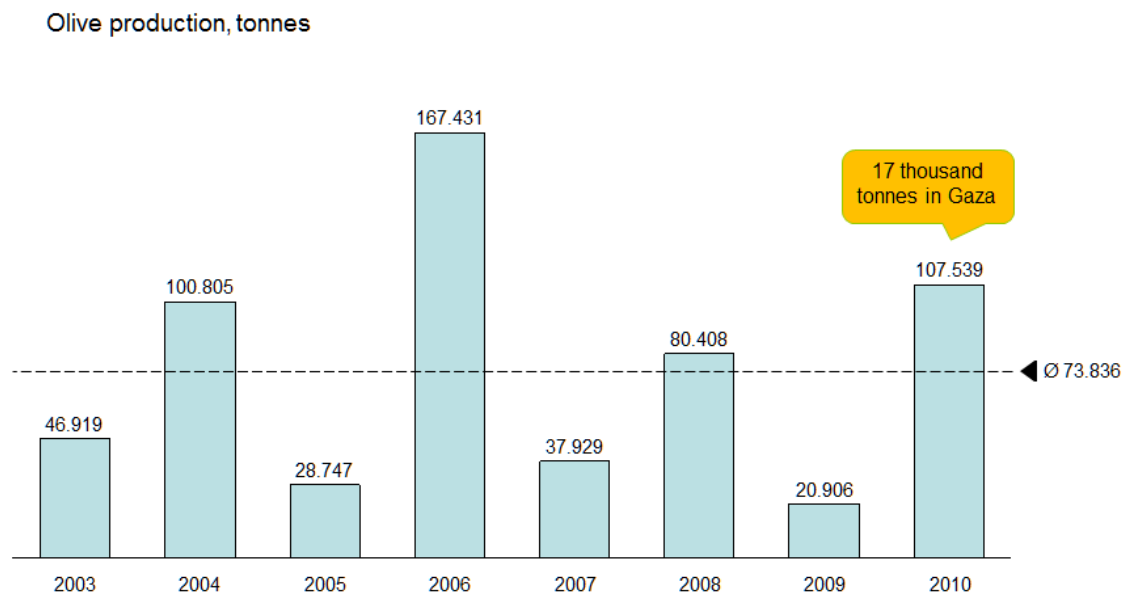


Figure 8.47 – Olive production in oPt, 2003-2010

There are significant annual variations that arise from the alternate biennial bearing phenomenon. Experts estimate that production could increase at least 30%, mainly by improving yields. Installed olive oil presses have the capacity to produce around 45 thousand tonnes of olive oil per year.

8.4 Bottlenecks

The major bottlenecks the sector is facing are low productivity and inconsistent, and often low, quality:

Low productivity

Average production in good years (recently in even years, like 2010, 2008, and 2006, as depicted in Figure 8.4), is 114,000 tonnes, below the domestic benchmark level of 167,000 tonnes achieved in 2006. Average production in off years has been only 30% of the production in good years, but this gap can be reduced by mitigating the effect of the alternating bearing phenomenon.

The main root causes for the low productivity are:

- Poor pruning techniques. Almost all of the olive orchards are cultivated in a traditional way, not as a commercial activity, with very few inputs and minimal husbandry
- Poor choice of areas, in terms of climate and soil, to grow olive trees. This is mainly due lack of knowledge, and lack of commercial acuity (smallholder production is

mainly for subsistence and for storage to mitigate the negative impact of low production years)

- Improper use of irrigation (especially supplementary irrigation) and use of low quality water
- Lack of a proper disease management model (i.e. a regional - within oPt - approach to disease prevention)
- Lack of appropriate agricultural tools and machines for cultivation of olive groves
- Insufficient agricultural extension (at local and national level)
- Lack of awareness/use of collective work among farmers. Outside family solidarity networks, farmers are not used to working together and organizing in professional and structured cooperatives
- Especially in Gaza, lack of some types of fertilisers (nitrate, potassium)

Inconsistent, and often low, quality

In 2005, five containers of Palestinian olive oil were rejected at EU borders in France, Italy, the UK and Belgium, because of the lack of conformity to EU standards. This is one example of the consequences of inconsistent, and often low, Palestinian olive oil quality.

The main root causes that explain this issue are:

- Poor agronomical skills during production and post-harvesting. For example, few farmers have access to the needed stainless steel storage tanks; they keep their olive oil in plastic containers, and the stored rapidly deteriorates
- Lost processing quality, due to:
 - Delays in pressing (olives should be processed within 48 hours of harvesting), especially among smallholders
 - Lack of access to presses, given that:
 - Smallholders' typical scale is too small (20 dunams is the minimum to be commercially viable), and this problem has increased with the fragmentation of land
 - Smallholders are fragmented and not organised
 - Lack of good feeder roads to connect farmers to processing areas
 - Old presses, with improper filters and inadequate storage
 - Incorrect use of the presses
- Farmers do not produce for specific markets. Most farmers have very little knowledge of export market requirements, and how to meet these. Hence, they continue to follow traditional harvesting, pressing and storage practises. Lacking reliable markets, farmers have little incentive to improve quality

Other bottlenecks

Besides low productivity and inconsistent, and often low, quality, there are also concerns regarding the negative impact of poor wastewater management, as random disposal of waste water (with high levels of contaminants) is increasingly creating environmental problems both for soils and groundwater. Not addressing these issues may well soon disqualify Palestinian olive oil in export markets, as well as threaten the viability of the this agricultural sub-sector.

8.5 Recommendations

The recommendations for the olive sector fall in four categories: improve orchard management, introduce supplementary irrigation, improve pest and disease management, and improve farmer organisation.

Improve orchard management

Global best practises, plus local field trials, point to the need and potential for good orchard management to boost crop production and crop quality. This can be achieved by provide good extension services to farmers, and organizing training workshops that confirm and embed the knowledge and skills of the farmers in the following areas:

- Pruning
 - Radical pruning of old and neglected olive trees, using chainsaws as the major pruning tool, are essential in creating a canopy of younger healthy wood with less pest and disease inocula harboured in the nooks and crannies
 - Pruning of over-large trees facilitates future harvests; more of the canopy will be reachable by hand
- Ploughing
 - Olives respond best to shallow ploughing that does not damage the upper feeding roots, but yet allows proper penetration of water into the soil
 - Some advisors have pointed to the need for more mechanised ploughing but in many instances small ploughs pulled by donkeys are all that is required, particularly in small orchards with steep slopes and limited room for equipment to operate
- Re-planting
 - Younger trees are more productive and easier to maintain and keep free of pest and diseases
 - Re-planting of ancient orchards is not currently a practical proposition for the poor small farmer, because they are reliant on the annual income from the old trees and re-planting immediately interrupts continuity of supply. A replanting initiative would require special financing arrangements
- Soil improvement
 - Incorporation of additional organic matter on an annual basis, preferably in conjunction with the annual ploughing would make a positive difference to productivity

Based on meetings with olive experts, it is estimated that the implementation of this recommendation can have a positive impact of 15% on productivity.

Introduce supplementary irrigation

Supplementary irrigation would not only directly promote olive productivity, but would allow for inter-cropping of annual plants. These resulting crop residues, combined with additional planting of forage crops, in a mixture that fits well with some livestock production, can all provide increased animal manure resources to small farmers.

Based on meetings with olive experts, it is estimated that the implementation of this recommendation could potentially have a positive impact of 30% on productivity.

Improve pest and disease management

Pest and disease control can be greatly improved through geographic management systems (i.e. making sure that farmer groups across a geographic area unite in an agreed and disciplined programme of pest and disease management). Regional management programmes should also include pest and disease management in fallow or abandoned areas where olive trees persist and harbor the pests and diseases affecting small farmer productivity. Finally, a strong business case must be made to farmers and their access to finance and appropriate inputs improved.

Based on meetings with olive experts, it is estimated that the implementation of this recommendation could have a positive impact of 15% on productivity.

Improve farmer organisation

Working together via producer groups enables farmers to pool resources to improve access to the assets and equipment needed to maintain their orchards and optimise production. It also helps to efficiently manage and coordinate the harvesting, the use of presses, and marketing.

Furthermore, most olive presses will not press less than 300 kg of olives at any one time, an amount that a single farmer working alone will need several days to pick. However, by working together, farmers can take their olives to press daily, in bulk, which improves quality through reducing delays between harvesting and pressing.

9. Cross-cutting Recommendations

This chapter presents 3 groups of cross-cutting recommendations. Their specific applications within each sub-sector have been described in those chapters, but their importance – both to the focus sub-sectors and to the oPt agricultural system as a whole – is such that their synthesis is warranted here. The cross-cutting recommendations can be discussed in three groups:

9.1 Farmers and Their Organisations

9.2 Strengthen and Diversify oPt Processing and Market Channels

9.3 oPt Agriculture's Enabling Environment

More details on each can be found in Appendix 6.

9.1 Farmers and Their Organisations

The specific rationale for this recommendation is covered in each value chain's specific chapter. This central cross-cutting recommendation has 3 interrelated aspects:

1. Use the identified business case and its advantages for the small farmers to mobilise them, initially the more advanced and entrepreneurial. A mix of lead firms, other private sector actors, public sector agencies and NGOs should be incentivised to engage them with training in financial literacy, business skills and improved agronomic and farming practises – with a particular focus on addressing women's needs
2. Incentivise the farmers to aggregate into business groups, either using existing structures or by creating new ones. Encourage service providers as honest brokers to support the groups' governance, transparency (supported by audits) and management capacity building
3. Convene partners to facilitate farmer groups' access to inputs, finance, market and other relevant information (e.g. weather, agronomic advice) and assets such as improved greenhouses and milk bulking and chilling plants, in coordination with the processors/traders and public institutions (discussed in 10.3)

Appendix 6 gives more details. Here we summarise the recommendations, specifically,

- Farmers should be supported to organise into units that can act as hubs through which they can efficiently access markets for goods and services. There are 3 basic farmer organisation models: producer business groups, cooperatives, and limited companies. The “best practise” model is value chain and context specific. TechnoServe's experience is that the smaller semi-formal producer business groups (PBGs) can work well when they operate at village level in the horticulture sector and their primary function is to aggregated sales and shorten the supply chain to the packhouse or wholesaler. In order to achieve economies of scale in interactions with suppliers and financiers, these smaller PBGs need aggregating into larger units, typically a cooperative. The optimal sized cooperative or company in dairy is at least several hundred farmers, adequate to consistently supply commercial quantities of milk, generally a minimum of 3,000 to 5,000 litres daily. Centred around a well-managed bulking and chilling facility, a local business hub can be created to facilitate accessing inputs, finance, animal health and other services. Some example models are depicted in Appendix 6.
- Given that the cooperative model is already being implemented in oPt, and figures prominently in current development plans, it is important to work as much as possible

with cooperative structures. Appendix 6 presents a system for assessing their readiness and existing capacity to participate.

- Focus groups and diagnostic exercises should be conducted with each candidate group or cooperative to assess current organisational capacity, member trust in leadership and readiness/motivation to change. Emerging from this effort is a development plan to implement a tailored suite of measures selected to address the group's specific challenges and needs.
- Overcome governance challenges: Governance is a critical element of capacity within farmer business groups or cooperatives. Typical governance challenges in organizing farmers into business oriented groups include:
 - Honest leadership, but lack of open transparent engagement with group members, especially women
 - Too much focus on the core business, which leads to the exclusion of those who are not yet ready to fully participate in the business activities
- Promote open and transparent internal communications, physical and financial transaction record-keeping, external audit processes. Buyers and financiers should come to expect to see the transparent records as part of the terms for continuing to develop and deepen their commercial relationships.²⁸ Governance structures and processes should be regularly 'audited' greater commitment of leadership to full member participation, especially by women. Support training interventions to strengthen leaders' skills.

This activity should be closely coordinated with the Ministries of Labour and Agriculture. More details are in Appendix 6.

9.2 Strengthen and Diversify oPt Processing and Marketing Channels

Specific recommendations regarding processing and marketing channels are presented in the focus sub-sectors' separate chapters. To review some key and common features, what is needed is to:

- Incentivise existing investors to improve their engagement with smaller suppliers through competitive processes that reward purchase commitments, provision of inputs and advice, and transparency in engaging with these suppliers
- Attract new investors who are ready to commit to targeting new higher value markets and sourcing from smaller suppliers with packages of limited market and credit support
- Consider a "buy-local" campaign, associated with, for example, a "Palestine Fresh" branding exercise, to help stimulate import substitution activities and consumer behaviors. Government agencies and/or MBOs might be encouraged to launch targeted marketing campaigns in support of some new local brands. Two sets of benefits would include:
 - Local market demand strengthening
 - Another tool by which quality standards can be set and perpetuated (registration to the brand would be subject to strict quality standards and reliability)

This initiative could tap into the latent "solidarity brand" potential in oPt.

²⁸ TechnoServe has used such a system to great effect to improve the governance and overall performance of coffee cooperatives within the East Africa Coffee Initiative, funded by the Bill & Melinda Gates Foundation

9.3 oPt Agriculture's Enabling Environment

Almost all aspects of oPt agriculture's enabling environment need strengthening. In particular we recommend improvements in the following areas:

- Financial Services
- Water supply
- Extension services and training
- Private business service providers
- Access to agriculture related information and market information
- Market regulations

Financial Services

Improvements in access to financial services are needed both 'internally' at the farmers' village or group level, and 'externally', via links to formal sector financial institutions.

- 'Internally', development of more lending schemes at the village, cluster of villages, or governorate level should be supported. NGOs can assist with lending group mechanisms and structures, provide training on savings and recordkeeping, and link the lending groups to available finance and micro-finance facilities.
- 'Externally', Palestinian banks need help to understand smallholder financial service needs and their related business opportunities, and support in adapting their financial products accordingly (including special products for women, building on what typically is their better creditworthiness, but poorer access to collateral). Intermediaries can help with this, as well as in training farmers and their groups in financial literacy, recordkeeping, and savings to improve the attractiveness of these individuals and organisations as borrowers.
- A mini-challenge fund could attract financial institutions to innovate in their service provisions in this area. Such a fund might offer underwriting support through partial guarantees for the financial institutions in concert with improved credit products for small farmers. Such interventions would be similar to a number of agri-credit guarantee schemes underway in Africa (e.g. with Standard Bank and AGRA, or that provided by the IFC through a number of bank-specific schemes).²⁹
- A method to help financial institutions to analyse and rank the credit-worthiness of agricultural sub-sector investments would help to develop more trust in agricultural sector products by the financial institutions. ScopeInsight has developed one example of this.³⁰ (See Appendix 6).
- One way to address the aversion to interest charges is to establish a private company that buys a traditional financial product from a financial institution, and resells it to farmers at a fixed cost, earning a profit tied to the interest rate being paid by the company to the financial institution. This model has been successfully implemented in Jordan by DEF (15 agencies and 40,000 clients, providing loans between \$500 and \$75,000) and NMB (8 agencies and 15,000 clients, providing loans between \$300 and \$15,000).
- Reef Company provides an example of a successful Palestinian financing model. Details can be found in Appendix 6.

²⁹ An overview of a risk-sharing guarantee mechanism can be viewed at: <http://www.ifc.org/ifcext/agribusiness.nsf/Content/SelectedPR?OpenDocument&UNID=A1FC810006B4A7C8852577A100503ABF>

³⁰ <http://www.scopeinsight.com/>

Independent development intermediaries with suitable experience, such as NGOs, should lead the assessment of the different financial models specific to each situation, and coordinate stakeholders for implementation.

There have been some 10 players supporting access to microfinance in oPt, including international NGOs (ANERA, CHF), and local NGOs (ACAD, ASALA, YMCA). These players have been supported by donors including USAID, the Spanish Aid Agency, IFAD, World Bank, IDA and the European Union. However, this support has not been particularly focused on agriculture.

Water

Given both its centrality to agricultural production, and its sensitivity in the oPt context, any agricultural support program will need to give significant attention to water. Specific actions should include:

- Support the development of small scale water resources and harvesting in relevant parts of Area A and B
- Advocate access to Area C land for water development
- Improve the efficiency of the current water supply system infrastructure by fixing and preventing leakages, and rehabilitate the system more generally, with agricultural supply a priority
- Improve the efficiency of water use, by:
 - Training farmers regarding when and how much to irrigate
 - Installing water metres at the farmer level.
 - Increasing the institutional capacity of the Palestinian Water Authority to improve the regulation of the water sector
- Include a water advisor on any forthcoming agricultural investment programme team to focus on: identifying specific opportunities for advocacy on water rights; identifying specific areas within area C where improved water rights and access are needed for specific projects and develop strong business cases as to why it is necessary, who it will benefit, and how to mitigate any risks to Israel; involving an Office of the Quartet representative in advocating on the above topics on behalf of the Palestinians.
- Assist the Palestinian Water Authority (PWA) to assess the efficiency of the water supply system and the viability of intervention in areas that are particularly affected by water shortage. Based on that assessment, the Ministry should evaluate the economic rate of return of investing in fixing and improving the infrastructure and make the case to increase their budget, or raise donor funding to support high priority improvements. Such investments and improvements should be prioritised to those areas where there is the greatest economic opportunity in agriculture in the short to medium-term.
- Incentivise smaller farmers and their cooperatives to invest in cistern construction, and water distribution and irrigation equipment to help them take advantage of new market opportunities. The incentives will arise as a combination of a) an agency, such as the Palestinian Water Authority, making available information about best locations for cistern construction, designs, technology, costings and opportunities via the upcoming EU-funded project, and b) farmers and their organisations developing business plans in the key value chains that indicate the incremental value-added from investments in irrigation and water harvesting. Update farmer training materials on efficient water use
- Introduce water metres and updated water pricing to regulate and optimise the use of publicly provided water, accompanied by a) appropriate regulations to enable water to be sold by volume, not time b) capacity-building support for the PWA to enforce the regulations.

The PNA, and the Palestinian Water Authority in particular, should lead the improvement in water regulation, and the assessment and fixing of water supply systems. It should be done in coordination with on-going and imminent donor programmes in this area. More details are in Appendix 6.

Extension Services and Training

More support is needed to improve farmers' knowledge of agronomic practises, management skills, understanding of the economics and opportunities in their sectors, and marketing skills (e.g. export procedures and logistics, pricing methods). While over time the intent should be that the private sector takes on most extension functions for production educations, a system of specialised extension service providers should be developed. Specifically, efforts should be made to:

- Strengthen the capacity of the Ministry of Agriculture to provide extension services in the short-term
 - Increase the budget allocation to the public extension service to guarantee an adequate ratio between extension officers and farmers by increasing the human resources available, and provide those agents with adequate knowledge, training skills, materials and support
 - Provide training to the extension officers, especially the younger ones, in applied research and farmer field school methods, so that they can quickly move beyond the merely theoretical and focus on supporting farmers to identify and address their priority production issues
- Use “challenge fund” type competitive processes to identify and strengthen alternative organisations to provide training and extension services, for instance through incentivising private companies, such as exporters, input suppliers, processors and traders, or specialised service providers to provide farmers with extension services for a fee (or fee equivalent, as it could be an embedded service and paid for out of the margin charged to the farmers on sale of inputs or purchase of outputs). This could include services to be provided by strengthened, commercial farmers' business organisations in the future as capacity is developed.
- Increase the trust between farmers and extension officers and incentivise farmers to participate by:
 - Integrating farmers' input and feedback into extension officers' training, and local research priorities, to ensure they are able to meet farmer needs
 - Helping engage women farmers more effectively by providing support to the Ministry of Agriculture and other service providers to promote the recruitment and training of women extension agents
- Demonstrate the agronomic results of implementing the training recommendations to the farmers. This can be done by performing demonstrations on farmers' fields, and creating local “champions” that set the example. Any such intervention would need to have the local ‘lead farmers’ commit to sharing the full details of their work with their neighbours.

Gender-specific interventions need to be included in the training to ensure improved engagement with and quality of life for women. Actions should include:

- Provide gender awareness, sensitisation and curriculum trainings for all extension service staff – to explore and understand traditional views of women, the implications of gender equality, how to handle gender issues and dynamics within training activities, and how to ensure that women are able to fully participate and absorb the training

- Host trainings at times that do not conflict with women's work schedules and at places that are easily accessible – safety and security issues for women remain; women must tend to household activities during certain parts of the day; childcare arrangements should be facilitated
- Sensitise male farmers – At a minimum, women may need to ask their husbands for permission to attend trainings. At least initially, the training should be for men and women together, with part of the training being explicitly to ensure that men and women come to appreciate the respective contributions and benefits of their respective skill improvements. Ensuring buy-in from men is critically important to increasing female participation. Male champions for female empowerment should be identified at community and farmer organisation leadership levels to lead, advocate for and support such initiatives.

Donor funding should support the Ministry of Agriculture in developing its extension services, as well as promote and support private company initiatives to provide some of the services. NGOs are best-suited to take the lead in building the capacity of farmer organisations in agriculture training. Over time such organisations should take the lead in providing/coordinating more services and trainings to their farmers, based on open internal communication about member needs.

Business Service Providers

Encourage the establishment of sub-sectorial business service providers by supporting the development of clear and aggregated demand for their services from the growing farmers and their organisations. Private service providers should be encouraged and appropriately supported and incentivised – initially -- wherever possible (such as for the exporting packhouses providing inputs and services on credit, or input providers supplying extension). Some services will have to be the domain of public agencies (e.g. for local standards development and food safety).

Improved agriculture related information and MIS

Improving the information available about the agriculture sector involves the implementation of two types of information related activities, those concerned with a) overall agriculture sector information, and b) Market Information System (MIS) development. Recommendations for overall agriculture sector information include the following:

- Improve the collection of data on exports and imports, both in terms of value and volume traded, with a levels of product disaggregation that is relevant and adequate to the specific markets and products being supplied (e.g. imported volumes of yogurt, white cheese, and fresh milk, instead of imported volumes of dairy as milk equivalent)
- Improve the reliability of demand data, namely by reconciling demand information based on household census data, and demand information calculated based on trade balances at the macro level
- Improve the analysis of trends of the main sectors. For example, Palestinian Census Bureau of Statistics (PCBS) reports provide information about trends in the major agriculture sectors, but stop short of undertaking regular analysis as to what is driving the observed changes over time.

The PCBS should lead the implementation of improved data collection and should have access to additional resources from within the public budget to enhance its capacity to do so. A competitive grant process can be used to incentivise other organisations, such as university departments or research centres, and product/industry associations to work closely with the PCBS to compile regular analytical reports of the changes in Palestinian agriculture.

Recommendations focused on MIS development include the following (see Appendix 6 for more information):

- Develop a MIS that would provide two types of services for farmers:
 - Static information
 - Information about inputs characteristics and usage
 - Dynamic information
 - Information about input prices, quality, and availability
 - Information about local and international prices of the products farmers are producing
 - further services like weather information and agronomic and husbandry recommendations.

To ensure the sustainability of these information services, it is important that it be profitable, or at a minimum recovers costs. Based on experience from other countries, an MIS initiative will need to be initially supported by donor and government funding and/or financial support from a telecom company (which might provide the service at no or low cost to farmers), and then developed into a commercially viable model.

Over time, the system could be expanded to enable transactions, mobile payments, and even to credit services linked to predictable or committed future payments, etc. Examples of innovation in this area are being promoted by the mAgri initiative of the GSMA.³¹ The mAgri initiative relies on levels of bandwidth and local institutional developments in the mobile services and banking arena that are not yet in place in oPt.

- Given oPt mobile penetration (reported as 51%, and rising), investigate opportunities to develop information channels such as:
 - SMS (short message service), where the farmer sends a request by text message, and receives the answer by the same channel
 - USSD (unstructured supplementary service data) menu available on the mobile phone (where the user navigates through a menu of options and then receives a SMS with the requested information)
 - Interactive Voice Response (IVR), which is similar to the USSD, but is a voice-based service, instead of text-based. Given the high literacy rates in oPt, the need for the investment in a voice-based service should be carefully evaluated, in light of farmers' preferences (despite being literate, he or she may prefer to access a voice, instead of text, based service)
 - For the introduction of more sophisticated services (like agronomic recommendations), an option would be to establish a call centre for the delivery of content not covered by the three channels above. In reported experiences, SMS, USSD, and IVR have proven able to cover 80% of the typical farmer's needs.

Other channels might include radio or local newspapers. More details are in the Appendix 6.

Strengthen market regulations

Enforce quality control of locally produced products, both at farm gate and at the industrial processing level. Western European and US buyers are particularly unforgiving. One bad quality shipment not only leads to it being rejected, but will blacklist the exporters for months or more. On the domestic market side, quality norms and consumer expectations are less well established.

³¹ http://www.gsm.org/our-work/mobile_planet/development_fund/magri_programme.htm

It is expected that the incentive for this would come primarily from within the private sector itself, especially for export vegetables. But more is required by the Ministry of Agriculture to continue to review and upgrade quality standards and inspection systems. Trips to other countries that have implemented such systems and reaped rewards would assist in building understanding among Ministry officials.

- At the farm gate, the Ministry of Agriculture should continue and reinforce the inspections it performs on the products that are going to be exported
- At the industrial processing level, and specifically in cow milk processing, quality inspections should be introduced to guarantee the final quality of the dairy product (for instance, by controlling the use of powdered milk) and ensuring proper product labeling.
- Enforce quality control of imported inputs and products, e.g. by improving control over chemicals that are beyond their sell-by date
- Define and enforce standards for the selling of fresh plant crops, e.g. by a shift to selling by standard box weight
- Increase consumers' awareness and farmers' knowledge about relevant regulations

In addition, as noted under the vegetables section above, it will be essential to create and adopt uniform produce marketing standards for the domestic markets.

The PNA, in collaboration with the Palestinian Standards Institution (PSI), should take the lead on implementing these activities. Canada and the UNDP have been working on strengthening marketing regulations, but mainly for the export market, and mainly for fresh vegetables.

Fit of Recommendations with existing Palestinian Agricultural Strategy

The PA and FAO produced a high level Shared Vision agricultural strategy in 2010 (17). The following table shows how the recommendations in the current report reconcile with the directions from the strategy. The strategy section references in the following table are explained in full in the Appendix.

Area of Focus for Recommendations in this study	Specific Recommendations of this study	Congruence with recommendations of the Shared Vision Agriculture Sector Strategy
Cross-cutting all parts of the Agriculture Sector and enabling environment	Strengthening and support to Farmer's Organisations	Broadly encompassed in SO1 but not at all specified or detailed in any extent MAJOR ADDITION
	Strengthening and diversification of Palestinian processing and marketing channels	Not actually specified and only inferred in SO6 and SO7 MAJOR ADDITION
	Improvements to Financial Services	Congruent with SO5.3 but more detailed and elaborated with best practices identified. SIGNIFICANT ADDITION
	Improve agricultural water supply and efficiency of its use, emphasising water-harvesting and supplementary irrigation	Congruent with SO2.1 and SO 2.2 but more detailed and elaborated with best practices identified, notably in cistern development. SIGNIFICANT ADDITION
	Strengthen Extension Services,	Broadly congruent with SO1, but mainly

	especially through gender sensitive training interventions	congruent with SO3.1, SO3.2, SO3.3, and SO5.2. This whole study provides a direct response to SO3.1.1. MAJOR ADDITION
	Encourage establishment of Business Service Providers	Not specified in any of the SO's but intimated in SO3.3 and SO5 generally. MAJOR ADDITION
	Improve agriculture-related information and market information systems	Wholly congruent with SO3.1.3 and possibly intimated in SO5.2.2 but much more detailed and elaborated. MAJOR ADDITION
	Strengthen market regulations	Wholly congruent with SO3.2 and SO6.1.1, but much more detailed and elaborated. SIGNIFICANT ADDITION
Vegetable sub-Sector	Improve export market channels and increase exports	Congruent to and highly responsive to SO6 SIGNIFICANT ADDITION
	Improve quality of agricultural inputs	Congruent to SO1.1.4
	Reduce dependency on imported inputs	Congruent to SO1.1.4 but provides next steps and specific best practices
Dairy Sub-Sector	Improve disease management	Congruent to SO4 but provides specific best practices
	Improve cold-storage infrastructure	Broadly intimated in SO6 but not at all specified or detailed in any extent MAJOR ADDITION
	Reduce dependency on imported inputs	Congruent to SO1.1.4 but provides next steps and specific best practices
Sheep & Goats Sub-Sector	Market-led value chain approach to be encouraged with all stakeholders	Congruent to SO4 but provides some suggestions for next steps and specific best practices
	Build market-driven incentive systems to encourage small farmers to modernise	Congruent to SO4 and SO6 but provides some suggestions for next steps and specific best practices
	Test & develop market-based systems to encourage semi-intensive and intensive rearing systems	Congruent to SO4 and SO6 but provides some suggestions for next steps and specific best practices
	Improve feeding practices and reduce dependence on imported feeds through contract fodder production	Congruent to SO4 and SO6 but provides some suggestions for next steps and specific best practices
	Increase women's presence and role in processing	Intimated in SO1.2.3 but provides some suggestions for next steps and specific best practices
	Explore branding opportunities for key products	Congruent with SO6.3.1 but specifically identifies branding as the next step

	Increase access to grazing land and creation of a National Plan for grazing and rangeland management	Congruent with SO2.3
Olive Sub-Sector	Improve orchard management	Congruent with SO4.1.2 but provides more specific details on approach to be taken – notably promotion based on proven added value. SIGNIFICANT ADDITION
	Introduce and promote supplementary irrigation	Congruent with SO3 and SO4.1.2 but provides more specific details on approach to be taken – notably promotion based on proven added value. SIGNIFICANT ADDITION
	Improve pest and disease management	Congruent with SO4.1.2 but adds the geographic management system for enhanced control

10. Aggregated Roadmap

Successful implementation of these recommendations will require coordinated efforts from opportunity-directed consortia over the next 3-5 years. This section discusses three issues in this regard:

- 10.1 Coordination
- 10.2 Estimated Cost
- 10.3 Activities and Phasing

10.1 Coordination

In the authors' view, two types of coordination are required:

1. *Coordinated donor decision-making with respect to the sector as a whole.* It is strongly recommended that DFID and the World Bank seek to coordinate their further support for the agricultural sector with other donors. A donor roundtable exercise could be used to address future respective roles in the sector, as well as the principles for engagement. The latter should focus on establishing the ground rules for incentivizing changed behavior for different types of economic actors. In consultation with public agencies details should be agreed on the mechanisms and targets for use of direct grants, grant percentages, timelines, etc. to ensure a level playing field is to be offered to local economic actors by all donors – so farmers and business service providers can be properly incentivised to invest in their farms and businesses.
2. *Opportunity-directed consortia.* There are many issues, often inter-related, that need to be addressed in the oPt agriculture system. Accordingly, there exist multiple co-dependencies between different recommended activities in terms of timing and scale. For this reason, mobilizing for action will best be achieved by organising activities against particular opportunities, and by the consortia necessary to respond to each of them. The different opportunity-consortia will need to be coordinated by an overseeing body that can accept programme management responsibility for the comprehensive 3-5 year initiative. The oPt Ministry for Agriculture should play a leading role in this, with funding and capacity-building support from a lead donor.

The overall implementing body for any new programme under which this report's recommendations could be conducted should preferably lead the specific design of each of the detailed plans for each consortia, and particular parties' participation. We make the point here that efforts will need to be both coordinated and directed at particular opportunities for them to succeed. Opportunity-directed consortia are likely to focus on (and not be limited to):

- Transforming local herb and vegetable market practises
- Transforming the export vegetable supply chain to include small farmers
- Developing optimal bulking and chilling facility business models with dairy farmers
- Developing women's group focused business plan competitions for artisanal sheep and goat milk processing
- Auditing and upgrading the water supply system

10.2 Estimated Cost

While not suggesting a particular design, an exercise to estimate a rough budget to support the proposed recommendations was undertaken in order to understand whether the proposed approach would achieve a good return on investment with good value for money. To do the exercise, we envisioned a structure that has core professional teams of 3-5 people covering the gamut of needs for each of the three key sectors, together with a cross-cutting team, some part-time technical experts, funds for challenge grants, and an overall project management infrastructure. Taken together over a 5-year period, such an approach would require a total budget of around \$12m, including travel and associated operating costs. This possible project cost does not include funds for financing access for the farmers and enterprises - such as loan guarantees for working capital and fixed assets, provision of first loss provisions or any equity required to expand businesses. It does however include an allowance of 25% of on-the-ground expenses for agency indirect/overhead costs and profits. At this level, the investment would be worthwhile.

10.3 Activities and Phasing

The roadmap laid out in the following 2 figures, below, is based on what we believe is an “achievable” programme to launch and scale up new or improved initiatives over a 5-year timeframe. This is not an all-inclusive design of such a programme with a comprehensive set of strategies and tactics driving outcomes through a specified logical framework. Rather it is an indication of how to potentially phase adoption of specific programmatic type actions that are driven off the broader set of recommendations in this document overall.

It lays out a suggested path based on three phases:

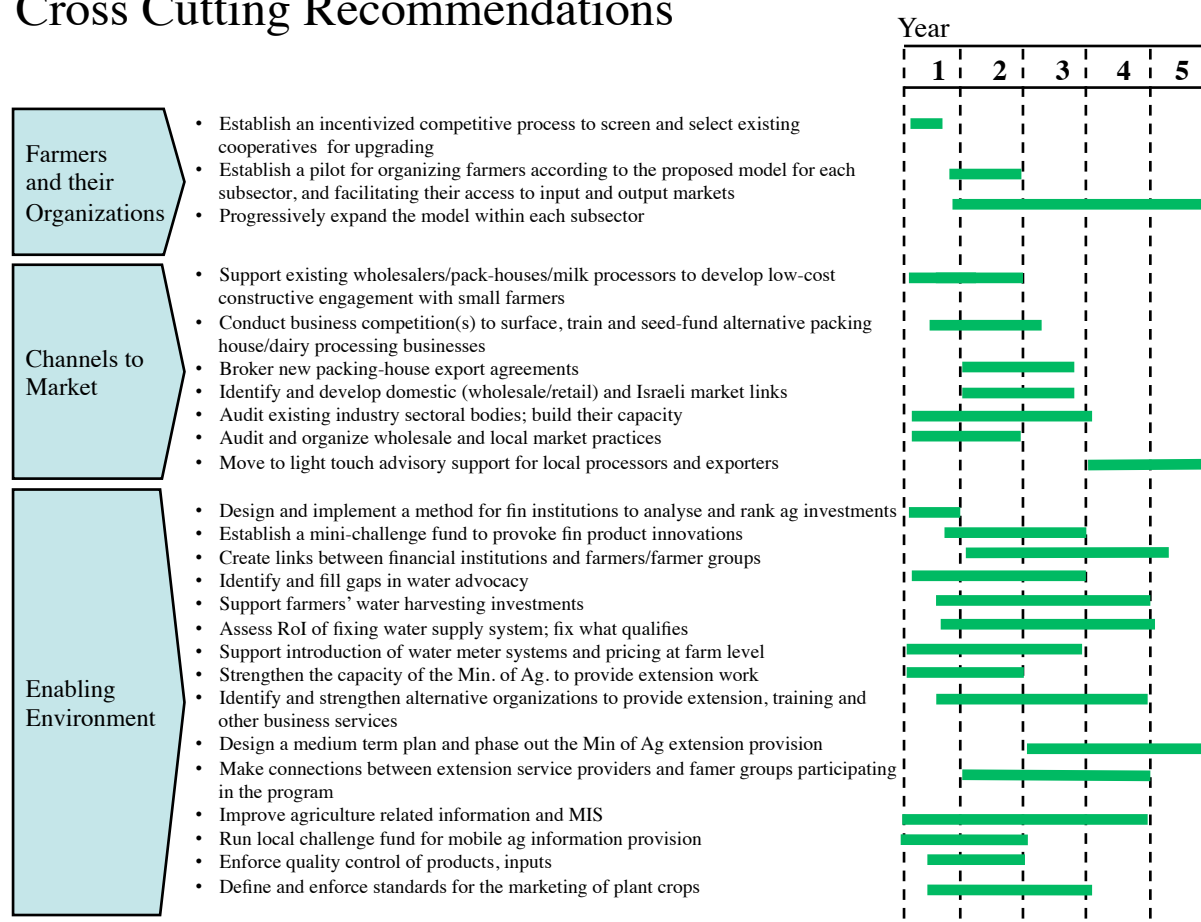
1. The first phase, “building momentum”, has the proposed duration of approx. 1.5 years (depending on start date). This new programme needs to demonstrate that it can deliver results and address some of the key enabling interventions – both are seen as important motivators for local farmers and other important stakeholders. Importantly, the programme will be need to be based on a clear vision about how it can be replicated and scaled up to reach a much broader set of programme participants and beneficiaries. This phase includes “quick wins”, i.e. interventions that can be implemented quickly and rapidly realise and demonstrate impact. Also in this first phase are activities that establish project baselines and fulfil other research/data needs. It will also include early activities on the “enablers” -- interventions that have to start being implemented early on as they will lay the foundation for the efficient establishment of the programme during the 5 years. This includes such things as capacity-building in the extension services, and cooperative development. The phase will also provide time for further “deep dive” investigations into areas, which need additional research such as the local market dynamics of the domestic vegetable supply chains. Finally, this phase will include pilots, interventions that are designed to test and tweak the recommendations before being applied to a broader set of players.
2. The second phase, “scaling up”, has the proposed duration of 2.5 years, from year 1.5 through year 4 of the programme. This phase will continue with the implementation of the enabling interventions, and will adapt and scale up the pilots implemented during the first phase of the programme to include a broader set of beneficiaries.
3. Finally, the third phase, “exit”, has the proposed duration of 1.5 years. In this phase, particular attention will be given to the exit strategy of the programme, and to ensuring that market players have the capacity and incentives to sustain and continue to build upon the positive market changes achieved during the programme.

The roadmap as presented below focuses on outward-leaning market-oriented activities; it does not include programme design and management activities, such as a detailed design, engagement of stakeholders in committing to the execution of the 5-year programme, the establishment of programme participant and beneficiary baselines, regular review of progress against monitoring and evaluation indicators, or periodic reviews and resetting of programme goals, objectives and activities.

The first figure, below, depicts the cross-cutting recommendations. As discussed in Chapter 9, these fall into 3 themes of activities:

1. Organise and upgrade the output of the supply base
2. Increase the activity, competitiveness, and constructive conduct of the processing and marketing channels
3. Strengthen the enabling environment, particularly water and advocacy

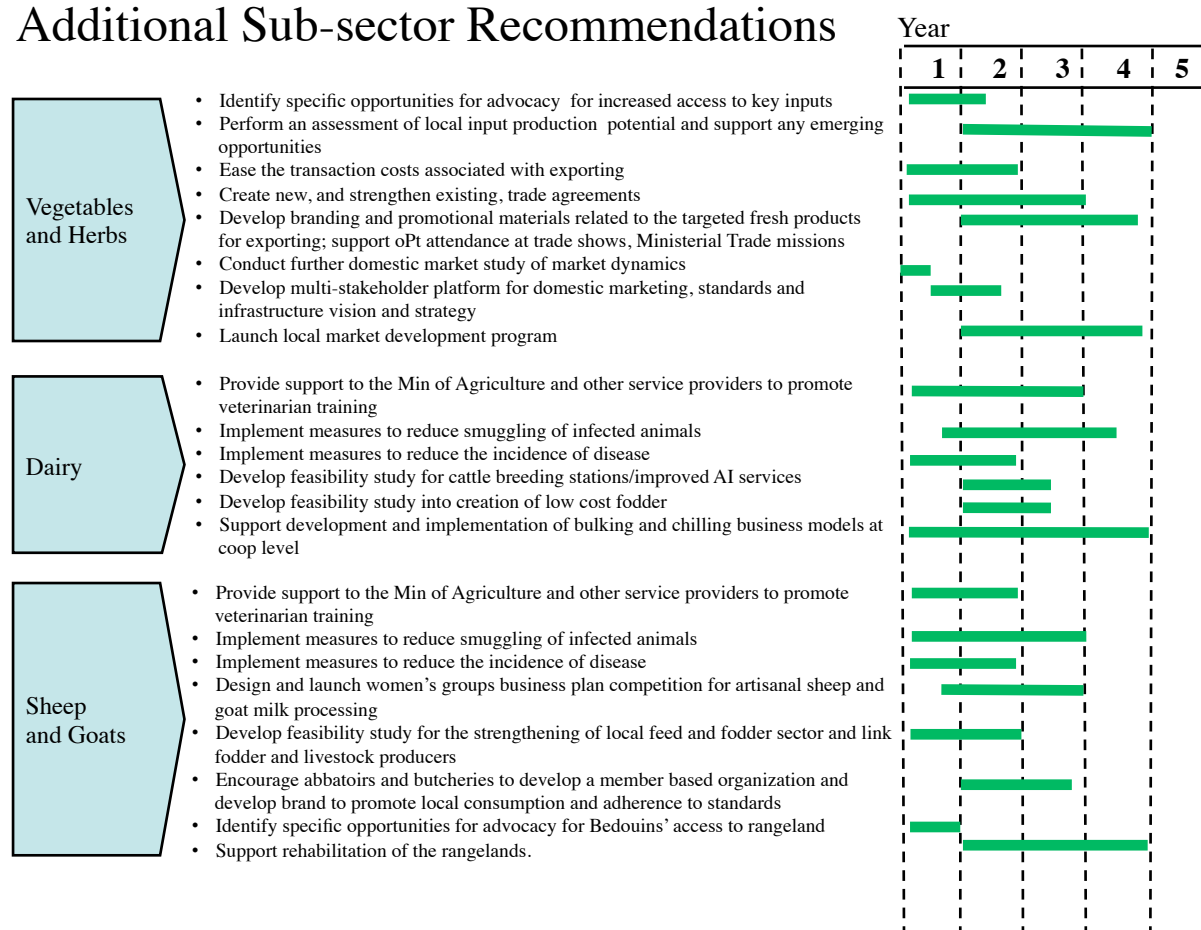
Cross Cutting Recommendations



The second figure below outlines the additional recommendations within each sub-sector. It is important to note that further levels of planning will be necessary within each recommendation suggested here. For example, we know that there is considerable diversity in factors such as land tenure, farmer asset holdings, experience and existing levels of market engagement in the existing vegetable farmer supply base. It will take much longer to help a poor, semi-literate subsistence farmer improve his knowledge and vegetable production to be capably market oriented, than it will

to support a leading medium scale grower to become fully export competitive, who may have already been supplying Sinokrot. Further work will be necessary to segment the producer base and to develop phased programming appropriate to the different segments of producers. Cohort 1 of farmers discussed in the vegetable chapter will progress faster through the vegetable recommendations than cohort 3. Further developments to the herbs sub-sector will be later again, due to the higher level of sophistication required to supply threshold quality produce to the export market (or to diversify to produce more of the (different again) herbs demanded by the local market).

Additional Sub-sector Recommendations



11. Comment on Next Steps

This report outlines at a high level a proposed strategic approach and road map for getting smallholder Palestinian farmers more engaged in the market systems in the oPt, for getting existing investors in the middle parts of the key value chains more engaged in sourcing from small farmers, for growing the markets where feasible and competitive and for a range of upgrades that are required in the enabling environment. Many of the latter come down to improvements that need to be made by various branches of the Palestinian Authority as well as a range of service institutions such as banks, business service providers, advisory agencies and NGOs.

In order to move from this high level document to preparing for implementation of the recommendations and the road map a number of critical next steps are suggested.

- Due to the very limited time and budget for this exercise the desired next steps of consulting extensively with the various stakeholders who will need to adopt the recommendations was not possible. This should be done imminently and prior to the finalisation of any specific programme to implement the recommendations contained herein.
- In particular, the Palestinian Authority will need to agree which parts of the administration will take the lead in driving adoption of the strategy and road map and be the lead public sector partner for implementation. Ideally a specific task team should be appointed led by a high-ranking public official who would report directly to ministerial level.
- The private sector players, the current investors as well as those contemplating making additional investments in these sectors, as well as the farmers and their organisations that will also need to invest, will need to be supported with the development of sound business cases that can underpin any calls for capital, whether from development financiers, impact investors or other sources of private capital.
- The various donor agencies that are mentioned herein as being actively interested in promoting the further development of the agricultural sector will need to be consulted and agree how to coordinate the various investments being made. One of the most critical of the next steps in this regard will be the establishment of a level playing field in terms of the investment climate and incentive frameworks. It is no good having a road map here that is founded on “crowding in” the private sector to support a system that increasingly operates on market principals that reflect the real cost of capital and other resources, if other donors are going to continue the provision of the self-same resources on a hand-out basis.

Once the PA leadership has been decided, the necessary consultations have taken place and the road map has been tweaked to reflect more accurately the broad range of stakeholder interests, a detailed programme design can be developed.

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