

upperquartile



Midline 1 Report



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List of Acronyms

CARD-F	Comprehensive Agriculture and Rural Development Facility
CSO	Afghan Central Statistics Organisation
DAIL	Development Agriculture, Irrigation and Livestock
DFID	Department for International Development
EDPs	Economic Development Packages
EQ	Evaluation Question
FTE	Full-time Employment
HA	Hectare
IED	Improvised Explosive Device
ISIL	Islamic State in Iraq and the Levant
ITR	Independent Technical Reviewer
KII	Key Informant Interview
MAIL	Ministry of Agriculture Irrigation and Livestock
MT	Metric tonne
NRVA	National Risk and vulnerability Assessment
RAMP	Rebuilding Agricultural Market Programmes (RAMP)
SQM	Square Meter
SSL	Small-Scale Layer
UN	United Nations
UNAMA	The United Nations Assistance Mission in Afghanistan

Executive Summary

This report presents the findings from the CARD-F midline 1 and rolling baseline data collection conducted in March 2017. 1659 interviews were administered in March 2017 by the evaluation team: 1448 interviews were for midline 1 and 211 for the rolling baseline. Due to the slower roll out of the programme, not all beneficiaries were identified at the baseline. Therefore, the evaluation team targeted newly added beneficiaries at midline 1 to cover them in a “rolling baseline.” Across the baseline and rolling baseline, a total of 96% of all identified beneficiaries were covered, **enabling the evaluation to maintain its virtual census of beneficiaries** at the baseline.

There were several data collection challenges. Measuring income continues to be challenging, showing significant variation. The evaluation team plans to collect additional income data and to continue to refine the way income is assessed. A second challenge was the closure of the Iranian and Pakistani borders, which affected the market assessments. However, the evaluation was able to overcome one weakness of the baseline, deploying female enumerators to all provinces to directly interview of the female beneficiaries. The short period of time which has elapsed since the baseline limits the number of findings. However, the evaluation team is confident that subsequent rounds of data collection will continue to build our evidence base.

1.1 Intervention logic

Despite a slower than anticipated start, CARD-F has fairly successfully rolled out the programme, and activities have started for most beneficiaries. There are early indications that the programme is yielding significant and positive results, though the evaluation team must emphasize that it is too early to yet to establish the impact of the programme. The early findings for the poultry value-chain are particularly promising, for both small-scale and large-scale beneficiaries. Respondents in general are happy with the programme activities and find the training sessions useful. Findings in the protected horticulture value-chain were more limited, as border closures impacted the market assessment and production had not yet started for many beneficiaries. In themselves, these results show that the intervention logic is so far successful, even if some transient challenges have impeded its effectiveness. Despite the theory of change seems appropriate so far, not all parts of the theory of change have been tested yet however: interventions aiming at facilitating an enabling environment or private investment without CARD-F financial assistance have yet to be implemented: both are necessary for the value chains to be fully sustainable. The resilience of SSLs and greenhouse to shocks is yet unknown. But these preliminary results do not seem to require any change in the theory of change so far. Going forward, the evaluation team is confident that the next rounds of data collection will bring more space to better assess the validity of the theory of change.

1.2 Early Recommendations

Poultry value-chain: the evaluation notes that the CARD-F associations offer several opportunities to the programme. Through them, CARD-F could facilitate the **development of a tight network of local input producers**. This has several potential benefits, including mitigating the impact of border closings. It could also enhance the offerings of current local feed mills by helping them **source better quality raw inputs**. CARD-F is in a strong position **to enforce quality standards among input producers benefitting from and selling to the programme** as well as to provide a steady market for those producers. Additionally, **offering cash-management training and rural credit options following Islamic standards** could allow CARD-F beneficiaries to directly purchase inputs, further mitigating the control major traders have over input quality and prices.

Midline 1 also uncovered some areas for improvement. Herat's large-scale beneficiaries stated that they had not attended any training, as these training sessions took place in Nangarhar in previously-established facilities. **Tailored initial training sessions and technical assistance to Herat hatcheries and breeder farms** over the next few months is of the utmost importance to ensure their successful market entry. Additionally, several large-scale beneficiaries have undertaken important investments to improve the initial CARD-F's design of their farm. To avoid any unnecessary investments, **initial training with existing beneficiaries should include an extensive explanation of the facilities' design**. If any new grantees are considered, **co-designing the facilities with beneficiaries** could improve designs and limit the need for extra investment.

Protected horticulture value-chain: the evaluation noted that price volatility and maintenance costs are key risks for beneficiaries, creating cash flow issues and threatening the financial viability of greenhouses. The evaluation recommends several steps which could be taken through the CARD-F associations to address these issues. These include **designing a system of risk sharing grants**, in addition to providing loans and credit. **Associations can also help beneficiaries purchase inputs jointly at better prices.** Finally, CARD-F should consider the creation of a **capacity building project for associations and beneficiaries, aimed at enabling them to co-design provincially-tailored risk assessment and management processes.** This last recommendation, if implemented, would not only build beneficiaries' confidence in associations, but enable them to independently address new bottlenecks as they arise, increasing the long-term sustainability of the CARD-F programme.

2.0 Introduction

This document is the second report for the Evaluation of the Phase II of the Comprehensive Agriculture and Rural Development Facility (CARD-F) programme. The report aims at presenting findings for the data collection of the midline 1 period.

In 2015, Upper Quartile, in partnership with Altai Consulting, was commissioned to undertake an independent evaluation of the United Kingdom Department for International Development (DFID) support to Phase II of the Comprehensive Agricultural and Rural Development Facility (CARD-F)¹. This report sets out the midline 1 and rolling baseline findings of the evaluation.

The CARD-F programme seeks to strengthen agricultural value-chains, aiming to increase **rural incomes, create jobs, and improve the trade balance** mainly through import substitution. Support to value-chains is a major element of Economic Development Packages (EDPs), which involve interventions in agricultural sub-sectors in defined geographical areas, addressing one or more value-chains. **This evaluation is addressing the poultry and protected horticulture ('greenhouse') value-chains** which together constitute 74% of planned expenditure under CARD-F Phase II.

The report is divided in three main sections: approach, findings, annexes.

- The **approach section** presents the sampling methodology as well as the challenges observed during data collection and analysis.
- The following two sections present the **findings for the sector assessment and beneficiary surveys**: one section for each value-chain (poultry and greenhouse). The market assessment sub-sections focus on the large-scale beneficiaries, while the surveys focus on the small-scale beneficiaries.
The third findings section presents the findings of the overall security situation and the impact of conflict on the programme.
- The final part of the report is dedicated to annexes: giving the detailed quantitative findings by value-chain as well as the updated work plan and questionnaires.

Table 1 on the following pages maps the evaluation midline 1 findings to the ten Evaluation Questions. This provides, at a glance, an overview of the progress to date of the CARD-F Phase II poultry and greenhouse value-chain interventions.

¹ <http://www.cardf.gov.af/>

Table 1: Evaluation question status at the midline

Evaluation Question ²	Midline Status			
EQ1: To what extent did CARD-F interventions result in net increases in rural income?	<i>Value-Chain</i>	<i>Province</i>	<i>Small-scale beneficiaries³</i>	<i>Large-scale beneficiaries</i>
	Poultry	Herat	Net change in overall household income ⁴ : 923 AFN to 2,560 AFN ⁵ (38.2 USD to 148 USD).	Annual net income from all CARD-F large-scale facilities (total for the entire province): Meat: 21,080,000 AFN (310,000 USD). Eggs: 2,856,000 AFN (42,000 USD).
		Kandahar	Net change in overall household income ⁶ : 797 AFN to 2,750 AFN ⁷ (12 USD to 41 USD).	Large-scale beneficiaries change in net income: N/A.
	Greenhouse	Kabul	Net change in overall household income ⁸ : 1,722 AFN to 3,595 AFN ⁹ (26 USD to 54 USD).	
		Kandahar	Net change in overall household income ¹⁰ : 1,328 AFN to 4,489 AFN ¹¹ (20 USD to 67 USD).	
		Nangarhar	Net change in overall household income ¹² : 1,316 AFN to 4,223 AFN ¹³ (20 USD to 63 USD).	
	<i>Value-Chain</i>	<i>Province</i>	<i>Small-scale beneficiaries</i>	<i>Large-scale beneficiaries</i>

² The exchange rate used from AFN to USD is from March 2017: 1 USD=67 AFN.

³ These numbers should be considered as highly indicative for two reasons. Firstly, the income questions changed at the midline and didn't ask directly the monthly income. Secondly, most respondents are illiterate and are unlikely to report accurately. Finally, these figures only cover individuals interviewed at both the baseline and midline (panel data).

⁴ Note that this is overall change in household income between the baseline and midline 1, as reported by beneficiaries. **Changes in income cannot be directly attributed to the CARD-F intervention at this stage.**

⁵ This covers 84 respondents interviewed at the baseline and at midline 1.

⁶ See footnote 4.

⁷ This covers 70 respondents interviewed at the baseline and at the midline 1.

⁸ See footnote 4.

⁹ Note this covers 6 respondents in Kabul interviewed at baseline and midline 1.

¹⁰ See footnote 4.

¹¹ Note this covers 12 respondents in Kandahar interviewed at the baseline and at midline 1.

¹² See footnote 4.

¹³ Note this covers 20 respondents in Nangarhar interviewed at the baseline and at midline 1.

Evaluation Question ²	Midline Status			
EQ2: To what extent did CARD-F interventions result in net additional rural jobs?	Poultry	Herat	N/A	Direct jobs: 47.5 ¹⁴ Indirect jobs: 17 ¹⁵
		Kandahar	N/A	No jobs created yet; estimated to create 75 direct jobs ¹⁶ No jobs created yet; estimated to create 17 indirect jobs Man-days for construction work since baseline: 7,980
	Greenhouse	Kabul	Direct jobs full time: 7 Direct jobs part time: 4 Indirect jobs: 1 Man-days for construction work since baseline: 3,150	
		Kandahar	Direct jobs: full time: 19 Direct jobs part time: 10 Indirect jobs: 4 Man days for construction work since baseline: 4,410	
		Nangarhar	Direct jobs: full time: 51 Direct jobs part time: 27 Indirect jobs: 9 Man-days for construction work since baseline: N/A	
EQ3: To what extent did CARD-F interventions result in net improvements in the agricultural trade balance?	Value-Chain	Province		
	Poultry	Herat	Gross value of CARD-F's annual production (Import substitution): Meat: 136 million AFN (2 million USD) Eggs: 27,200,000 AFN (405,000 USD)	
		Kandahar	N/A	
	Greenhouse ¹⁷	Kabul	Gross value of CARD-F's greenhouse annual production:	

¹⁴ Including 35 direct jobs in broilers, 7.5 in layers and 5 in the breeder and hatchery.

¹⁵ Indirect jobs are indirectly created by CARD-F activities within the value-chain, through activities such as input supply, transportation, processing and extra labour required for agricultural activities (harvest and post-harvest activities).

¹⁶ Including 60 jobs in broilers, 5 in layers and 10 in breeders and hatcheries.

¹⁷ These numbers come from CARD-F M&E data.

Evaluation Question ²	Midline Status			
			Baseline 10,385,000 AFN (155,000 USD) / Midline 18,358,000 AFN (274,000 USD).	
		Kandahar	Gross value of CARD-F's greenhouse annual production: Baseline 10,653,000 AFN (159,000 USD) / Midline 20,234,000 AFN 302,000 USD).	
		Nangarhar	Gross value of CARD-F's greenhouse annual production: Baseline 33,299,000 AFN (497,000 USD) / Midline 63,114,000 AFN (942,000 USD).	
EQ4: To what extent were the right beneficiaries selected?	<i>Value-Chain</i>	<i>Province</i>	<i>Small-scale beneficiaries</i>	<i>Large-scale beneficiaries</i>
	Poultry	Herat	Baseline vs. midline 1: 17.9% are literate (+3.9 percentage points). 4% have "a lot" of farming experience (+4 percentage points). 4% have prior experience with poultry (+4 percentage points). 56% have some small business experience (-36 percentage points). 63.1% have "a little" experience in accounting (-13.2% points). 4.8% have managed a poultry/egg business (-6.6% points).	Baseline vs. midline 1: 30 % of beneficiaries have more than 3 years of experience (+19 percentage points). 90 % of beneficiaries have a previous experience in the sector (-5% points).
		Kandahar	Baseline vs. midline 1: 10% are literate (+8 percentage points). No one had farming experience at the baseline nor at midline 1. 14.3% have 'a little' experience with a small business (-32.7 percentage points). 21.4% have 'a little' experience with accounting (-21.9 percentage points).	Baseline vs. midline 1: 60 % of beneficiaries have more than 3 years of experience (+30 percentage points). 90 % of beneficiaries have a previous experience in the sector (+8 percentage points).

Evaluation Question ²	Midline Status		
			11.4% have managed a poultry/egg business (-26.7 percentage points).
	Greenhouse ¹⁸	Kabul ¹⁹	Baseline vs. midline 1: 100% are literate (+10 percentage points). 66.7% have “a lot” of experience with a small business (-13.3 percentage points). 100% have a lot of experience with accounting (+30 percentage points). 33% have experience investing in and operating a greenhouse (-17 percentage points).
		Kandahar ²⁰	Baseline vs. midline 1: 100% are functionally illiterate (+26.3 percentage points). 83.3% have ‘a little’ experience with investing in and managing a business (+51.7 percentage points). 25% have ‘a little’ experience with accounting (-14.5 percentage points). 8.3% have prior experience in investing in a greenhouse (-2.2 percentage points).
		Nangarhar ²¹	Baseline vs. midline 1: 77.8% are literate (+22.2 percentage points). 55.6% have ‘a little’ experience with a small business (+12.7 percentage points). 44.4% have ‘a little’ experience with accounting (+6.3 percentage points). 11.1% have prior experience in operating a greenhouse (-17.4 percentage points).
EQ5: To what extent did CARD-F encourage new investments in the	<i>Value-Chain</i>	<i>Province</i>	

¹⁸ This covers only the GH owners.

¹⁹ This covers only 10 respondents interviewed at baseline and 6 respondents interviewed at midline 1.

²⁰ This covers only 38 respondents interviewed at baseline and 12 respondents interviewed at midline 1.

²¹ This covers only 63 respondents interviewed at baseline and 9 midline respondents interviewed at midline 1.

Evaluation Question ²	Midline Status			
value-chains independent of any financial support provided by CARD-F?	Poultry	Herat	No new investments reported.	
		Kandahar	Some new investments but creation rate is no higher than before the CARD-F intervention.	
	Greenhouse	Kabul	Up to 250 new greenhouses constructed without financial support since the beginning of CARD-F's intervention.	
		Kandahar	40 new greenhouses constructed without financial support since the beginning of CARD-F's intervention.	
		Nangarhar	20 new greenhouses constructed without financial support since the baseline.	
EQ6: Did the production scale to demand?	Value-Chain	Province		
	Poultry	Herat	Meat: Domestic production equals 32% of total volume consumed in province (+1% from baseline). Eggs: Domestic production equals 77% of total volume consumed in province (+13% from baseline).	
		Kandahar	No CARD-F facilities in production yet.	
	Greenhouse	Kabul	Tomatoes: CARD-F's annual production equals 0.01% of traded volume off-season in provincial centre. Cucumbers: CARD-F's annual production equals 0.6% of traded volume off-season in provincial centre.	
		Kandahar	Tomatoes: CARD-F's annual production equals 0.5% of traded volume off-season in provincial centre. Cucumbers: CARD-F's annual production equals 0.8% of traded volume off-season in provincial centre.	
		Nangarhar	Tomatoes: CARD-F's annual production equals 27% of traded volume off-season in provincial centre. Cucumbers: CARD-F's annual production equals 11% of traded volume off-season in provincial centre.	
	Value-Chain	Province	Perceived bottlenecks: small-scale beneficiaries	Perceived bottlenecks: large-scale beneficiaries
EQ7: What bottlenecks are arising in target sectors in which CARD-F did not	Poultry	Herat	Baseline vs. midline 1:	Baseline:

Evaluation Question ²	Midline Status		
intervene?			<p>Poultry diseases: 84.5% (-6.5 percentage points).</p> <p>Weather hazards: 11.9% (-5.1 percentage points).</p> <p>Poultry disease: 84.5% (-6.9 percentage points).</p> <p>Poultry feed quantity: 46.4% (+46.4 percentage points).</p> <p>Poultry feed quality: 15.5% (+5.4 percentage points).</p> <p>Lack of security: 0% (-63 percentage points).</p>
		Kandahar	<p>Baseline vs. midline 1:</p> <p>Lack of security: 0% (-91 percentage points).</p> <p>Land issues/lack of land: 20% (-1 percentage point).</p> <p>Lack of water: 10% (-11 percentage points).</p> <p>Poultry Feed quality: 54.3% (+27.6 percentage points).</p> <p>Poultry Feed quantity: 45.7% (+45.7 percentage points).</p>
	Greenhouse ²²	Kabul	Baseline vs. midline 1:

²² This covers owners and managers' responses.

Evaluation Question ²	Midline Status		
			<p>Lack of water: 0% (-80 percentage points).</p> <p>Land issues/lack of land: 0% (-70 percentage points).</p> <p>Crop diseases: 66.7% (+6.7 percentage points).</p> <p>Weather hazards: 83.3% (+66.6 percentage points).</p> <p>Access to credit to support (post-) harvest activities: 66.7% (+66.7 percentage points).</p> <p>Fertilizer quality: 66.7% (+50 percentage points).</p>
		Kandahar	<p>Baseline vs. midline 1:</p> <p>61.5% Crop disease (+53.2 percentage points).</p> <p>Lack of security: 0% (-95 percentage points).</p> <p>Weather hazards: 7.7% (-34.3 percentage point).</p> <p>Lack of technical knowledge: 0% (-28 percentage points).</p> <p>Land issues/lack of land: 7.7% (-19.3 percentage points).</p>
		Nangarhar	<p>Baseline vs. midline 1:</p> <p>Lack of security: 0% (-29 percentage points).</p> <p>Land issues/lack of land: 3.6% (-23.4 percentage points).</p> <p>Lack of water: 14.3% (-12.7 percentage points).</p> <p>Weather hazards: 39.3% (+21.3 percentage points).</p> <p>Low demand: 96.4% (+91.4% percentage points).</p> <p>Pesticide quantity: 92.9% (+92.9 percentage points).</p> <p>Seed quality: 82.1% (+82.1 percentage points).</p>
EQ8: To what extent did CARD-F created associations have a beneficial impact?	<i>Value-Chain</i>	<i>Province</i>	
	Poultry	Herat	<p>CARD-F's associations for large-scale beneficiaries have recently been created in the two regions.</p> <p>One CARD-F association has been created specifically for women who own SSLs in Herat. However, no SSL association has been created yet in Kandahar.</p>
		Kandahar	
	Greenhouse	Kabul	<p>CARD-F has created two associations (one each in Kabul and Kandahar) since the baseline. Associations are considered to have a positive impact on:</p>
		Kandahar	

Evaluation Question ²	Midline Status			
		Nangarhar	<ul style="list-style-type: none"> - Sourcing inputs. - Discussing common issues. - Provide networking opportunities. <p>However, there are gaps reported in the following areas:</p> <ul style="list-style-type: none"> - No storage or transportation services. - No financial support (only in Kandahar). - No distribution channel (beneficiaries favour short distribution channels). 	
EQ9: To what extent were CARD-F services to farmers and businesses effective?	<i>Value-Chain</i>	<i>Province</i>	<i>Small-scale beneficiaries</i>	<i>Large-scale beneficiaries</i>
	Poultry	Herat	Herat households attended 4.3 training sessions on average. 80% said they gained experience in hatching chickens, fixing hutches, administering medication or caring for pullets.	<p>Technical design: several complaints regarding technical weaknesses. Beneficiaries have made complimentary investments to enhance their facilities.</p> <p>Extension programme:</p> <ul style="list-style-type: none"> - 60% of interviewed beneficiaries attended training and considered it useful. - 40% of interviewed beneficiaries did not attend training session; 20% because they consider them not useful, 20% due to security reasons. <p>The location of some training in Nangarhar seemed to be an issue.</p>
		Kandahar	Kandahar households attended on average 0.25 training sessions. 80% said they gained good experience in hatching chickens, fixing hutches, administering medication and caring for pullets.	N/A (there were no operational large-scale beneficiaries at the midline)
		Kabul	68.4% found the training at least “a little” useful. Training on how to prune / thin plants and use the right amount of water for plants were particularly well	

Evaluation Question ²	Midline Status			
	Greenhouse ²³	Kandahar	received. Respondents in Nangarhar reported the highest satisfaction across all types of training.	
		Nangarhar		
EQ10: To what extent will benefits continue after CARD-F ceases to deliver?	<i>Value-Chain</i>	<i>Province</i>	<i>Small-scale beneficiaries</i>	<i>Large-scale beneficiaries</i>
	Poultry	Herat	Too early for a full assessment. However, no evidence of drop to date.	Survival rate of production facilities: 100%.
		Kandahar	Too early for a full assessment. However, no evidence of drop to date.	Survival rate of production facilities: 100% (note facilities not yet operational)
	Greenhouses	Kabul	Too early for a full assessment. However, no evidence of drop to date.	
		Kandahar	Too early for a full assessment. However, no evidence of drop to date.	
		Nangarhar	Too early for a full assessment. However, no evidence of drop to date.	

²³ This covers owners and managers' responses.

3.0 Approach

The evaluation team is using Contribution Analysis, probing ten evaluation questions relating to critical parts of the CARD-F programme's theory of change. To answer these questions, the evaluation is examining the poultry and greenhouse value-chains through information and data collected from the beneficiary level up through broader stakeholders. As these value-chains are different in scope and activities, they are being evaluated through mixed methodologies tailored to fit the chain concerned and the scope of the intervention.

The evaluation relies on three main data sources: interviews with direct and indirect programme beneficiaries, data collected from non-beneficiaries in the sectors concerned, and secondary sources. The first two sets are collected by the evaluation team and are covered below.

The evaluation has a longitudinal design, collecting data at regular periods throughout the project's implementation. This will enable understanding of the overall evolution of the value-chains ecosystem at each stage during the life of the programme. The data collection stages are detailed in Table 2 below.

Table 2: Evaluation Data Collection Stages

Data Collection Stage	Date
Baseline	Aug.-Oct. 2016 (Complete)
Midline 1 and Rolling Baseline	Mar.-Apr. 2017 (Complete)
Midline 2	Aug.-Oct. 2018 ²⁴
Endline	Mar.-Apr. 2019

This section gives an **overview of the midline 1 sample and the rolling baseline sample**—who was interviewed where—as well as detailing key sampling issues identified by the evaluation team.

3.1 Sampling overview

The evaluation team broadly duplicated the approach developed for the baseline (see Baseline Report, Section 3). This involved the collection information across the poultry and greenhouse value-chains—from the household level up through the broader stakeholders. **Beneficiary interviews** were the largest part of the fieldwork. This had two categories of respondents:

- 1) Small-scale producer beneficiaries (small-scale layer (SSL) and greenhouse owner beneficiaries) represent a large number of relatively small investments, and were surveyed through a close-ended questionnaire.
- 2) Large-scale producers and service organisations (such as associations and producers' groups, business development services, poultry clinic, etc.) benefiting from the CARD-F programme were interviewed qualitatively with more open-ended questions, to allow for the team to collect quantitative data while following deeper investigation lines.

The evaluation team also conducted **sector assessments**, to collect information from broader value-chain stakeholders, many of whom were not direct CARD-F beneficiaries. This took place through key informant interviews at all steps of the target value-chains, as well as the use of existing secondary data (such as market prices monitoring, trade figures), much of which is available from the Ministry of Agriculture, Irrigation and Livestock (MAIL).

Owing to a slower than anticipated roll-out of the CARD-F programme, some small-scale beneficiaries were not identified at the time of the baseline survey. It was agreed that the evaluation team would conduct complementary baseline interviews with all new beneficiaries as part of the Midline 1 fieldwork. This enables the evaluation to maintain its complete census of covered beneficiaries. Therefore, during

²⁴ Note midline 2 dates are under discussion with DFID-A, in order to balance the timing of the data collections with the need for information for the Annual Reviews.

Midline 1, additional “rolling” baselines took place in Kandahar for the poultry value-chain, and Kabul and Kandahar for the protected horticulture value-chain. There were no new beneficiaries in Herat or Nangarhar provinces to add to the baseline dataset. Moving forward, no further rolling baseline data collections will be conducted in order to ensure comparability within the baseline dataset and allow sufficient time for further programme activities to take place.

Table 3 below presents the sampling for the small-scale producers—e.g. the SSL and greenhouse beneficiaries. Table 4 presents the sampling for the sector assessment key informant interviews, of large-scale beneficiaries and complimentary actors. Table 5 details the poultry and protected horticulture consumer surveys, which are also part of the sector assessments. These surveys examine demand, consumption volume and characteristics through phone surveys. These interviews allow the evaluation to explore if CARD-F is contributing to changes at lower and higher levels of the value-chain.

Table 3: Small-scale beneficiary sample

Province	SSLs				Greenhouse			
	Midline target	Midline achieved	Rolling baseline target	Rolling baseline achieved	Midline target	Midline achieved	Rolling baseline target	Rolling baseline achieved
Herat	83	90	-	-	-	-	-	-
Kabul	-	-	-	-	4	7	3	3
Kandahar	83	84	200	199	15	19	14	16
Nangarhar	-	-	-	-	29	34	-	-
Total	166	173	200	199	50	60	17	19

Table 4 Sector assessment sample (including large-scale beneficiaries and complementary actors)

Province	Poultry		Greenhouse	
	Midline target	Midline achieved	Midline target	Midline achieved
Herat	43	38	-	-
Kabul	-	-	20	17
Kandahar	43	45	20	17
Nangarhar	-	-	20	19
Total	86	83	60	53

Table 5: Consumer survey sample²⁵

Province	Poultry			Protected horticulture		
	Midline target	Midline achieved	Response rate	Midline target	Midline achieved	Response rate
Herat	125	137	109%	125	130	104%
Kabul	125	140	112%	125	136	108%
Kandahar	125	119	95%	125	111	88%
Nangarhar	125	132	105%	125	127	101%
Sub total	500	528	105%	500	504	100%
<i>Complementary calls in other provinces</i>						
Other provinces	-	22	-	-	25	-
Total	-	550	-	-	529	-

²⁵ Note that this is the first household-level consumer survey conducted by the evaluation. Protected horticulture consumer surveys were not conducted at the household level at the baseline. Instead, consumer information for this value-chain was gathered at the baseline through key informant interviews with market traders. This was due to the timing of the baseline—surveying households on their off-season fruits and vegetables consumption through consumer phone surveys at the peak of the harvest would not yield useful results. Please see the Baseline Report Section 3 for more information. The Midline 1 survey took place during the off-season, which enabled the evaluation team to conduct phone consumer surveys for protected horticulture.

Table 6 below provides a summary overview of the targets and achieved sampling by actor type.

Table 6: Midline 1 and rolling baseline interviews by actor type

	Actor type	Target	Achieved	%
Small-scale beneficiaries	Small-scale layer benef.	166	173	104%
	Greenhouse benef.	48	60	125%
Sector assessment: poultry	Feed mill benef.	1	0	0%
	Hatchery benef.	1	1	100%
	Breeder benef.	1	1	100%
	Layer farm benef.	2	4	200%
	Broiler farm benef.	13	12	92%
	Clinic and VFU benef.	1	2	200%
	Association benef.	2	2	100%
	Input traders	4	8	200%
	Feed mills	4	4	100%
	Breeder farms	4	0	0%
	Hatcheries	0	1	-
	Layer farms	4	3	75%
	Broiler farms	6	6	100%
	Clinics and VFU	2	3	150%
	Associations	2	3	150%
	Traders	10	9	90%
	Wholesalers	4	4	100%
	Retailers	4	4	100%
	Transporters	4	3	75%
	MAIL/DAIL staff	6	4	66%
	CARD-F Teams	4	7	175%
	Contractors and implementers	4	2	50%
	Total sector assessment	83	83	100%
Sector assessment: protected horticulture	Input traders	12	12	100%
	Traders	12	13	108%
	Wholesalers	6	9	150%
	Retailers	6	6	100%
	Transporters	6	3	50%
	MAIL/DAIL staff	6	2	33%
	CARD-F Teams	6	3	50%
	Association	3	2	67%
	Contractors	3	3	100%
	Total sector assessment	60	53	88%
Consumer surveys	Poultry	500	550	110%
	Protected horticulture	500	529	105%
	Total consumer surveys	1000	1079	108%
Rolling baseline				
Small-scale beneficiaries	Poultry	200	199	99%
	Protected horticulture	17	19	112%
	Total rolling baseline	214	211	99%
Total interviews completed		1571	1659	106%

Unfortunately, no breeder farms were interviewed during the midline. Only a single breeder had started its activities in Herat, and it had opened only a week before the survey. This facility did not have any information to share as, at the time, the facility was under a sanitary quarantine for the first few months of operations.

The fieldwork tools used for the midline 1 and rolling baseline fieldwork were broadly similar to baseline tools, with only minor modifications. Changes were based on lessons learned as well as methodological discussions with the DFID team in Afghanistan. These changes centred around five main areas. First, enabling more comparability with other surveys, particularly the National Risk and Vulnerability Assessment. Second, gaining additional information around income and revenue, as there was higher than expected variation in the baseline. Third, complementary questions were added to evaluate training sessions and events provided by CARD-F teams as well as CARD-F's associations. Fourth, where the grant recipient was not the respondent, the relationship between the interviewee and the grant beneficiary was probed more deeply. Finally, a section of qualitative questions was added, probing if there are changes in the status, employment and income of women in the family as the CARD-F programme progresses. More information on specific changes to surveys can be found in the Midline 1 Fieldwork Report. The questionnaires themselves can be reviewed in Annexes 5-11 of this report.

3.2 Sampling challenges

There were several key issues arising from the midline 1 and rolling baseline data. First, there continues to be a large amount of variation in the household income data of both SSLs and greenhouse. Second, as noted in the Baseline Report, the evaluation team was unable to send female enumerators to Kandahar to survey female SSL beneficiaries at the baseline. Thanks to improvements in the security situation, the team was able to send female enumerators to collect the midline 1 and rolling baseline data. However, this creates some challenges for analysis. Third, at the time of the fieldwork, both the Iranian and Pakistani borders were closed, which impacted prices. Finally, the evaluation experienced some difficulties with accessing secondary data, both from the CARD-F programme and the ITR, to triangulate its findings. The evaluation team will continue to work with CARD-F and the ITR to share data and findings across the teams

Income questions

One of the main concerns from the baseline was the large differences observed in income and revenue reported by beneficiaries. In order to mitigate the risk of inaccurate data and after detailed discussions with the DFID Afghanistan team, new questions from Sections 7 and 9 from the National Risk and Vulnerability Assessment (NRVA) 2011-2012 were added to the household survey²⁶. These questions focus on income and specific durable household goods. This enabled the evaluation team to re-examine if households are likely to be above or below the Afghan national poverty line.

Despite the new questions, large differences continue to be observed at midline 1 and the rolling baseline. As such, the evaluation team will be re-contacting the midline 1 and baseline beneficiaries between August and October 2017 to ask the original income questions again²⁷. This is to maximise comparability—the team wanted to re-ask these two questions again during the same period as the baseline, to minimise the likelihood of seasonal variation. The responses at the individual level will be compared with the baseline results again for internal consistency. The results of this will be included in midline 2.

The evaluation team anticipates that significant variations in reported beneficiary income will continue to be observed. This is because, particularly for SSL and greenhouse manager beneficiaries, the income, revenue, cost and production data provided are rough estimates. It is often difficult for beneficiaries to give precise numbers as they do not always keep detailed records of their accounts or their production. In many cases, the evaluation surveys show that beneficiaries are illiterate, making record keeping challenging. For cultural reasons, female beneficiaries are also likely to have limited information about the household's income and revenue.

Going forward the evaluation team will probe income in four different ways: through the original two baseline income questions, the NRVA income questions, and the NRVA household durable goods

²⁶ This survey is known as the NRVA, and is conducted by the Afghan Central Statistics Organisation with the support of the European Union. It is used to help measure the Afghan national poverty line.

²⁷ These are questions D04 and D07 from the original Baseline Questionnaire. Please see the Baseline Report Annexes for additional information.

questions. The results of these different questions will be triangulated, to give the evaluation more confidence that observed changes in income are not due to beneficiary estimation error.

Female enumerators

SSL farm beneficiaries are overwhelmingly female by design. However, at the baseline, the evaluation team was unable to send female enumerators to Kandahar due to security concerns. Fortunately, at the midline 1 and rolling baseline, the evaluation team was able to send female enumerators to both Herat and Kandahar. This enabled the team to mitigate a potential weakness from the baseline. The evaluation team will continue to send female enumerators to Kandahar and Herat whenever it is possible. However, because the evaluation team knows that different people were interviewed at the baseline and midline 1, it makes panel data analysis more difficult. The evaluation team cross-checked findings across provinces and data collection period. Going forward the team hopes to further triangulate findings using secondary data. More detail on the quantitative analysis can be found in Poultry small-scale beneficiary survey findings below, as well as Annexes 1-2. In addition, the team anticipated some changes in findings once women were directly surveyed—for example, a sharp decrease in the number of respondents who work as farmers and an increase in homemakers. However, there were some unexpected shifts—for example, males and females defined “household” differently, which gives differing household size numbers. This is explored further detail Poultry small-scale beneficiary survey findings below. Going forward, the evaluation team plans to more clearly define “household” during the survey²⁸.

Closed borders

During the evaluation team’s data collection, both the Iranian and Pakistani borders were closed. The Iranian border was closed because of sanitary hazards on poultry products. The Pakistani border was closed for political reasons. The evaluation team found from Key Informant Interviews (KIIs) that these combined closures had a short but profound impact on prices across several steps of the value-chains. The effect of this has been explored in detail in the analysis below, especially vis-à-vis the baseline results and the next midline due in 2018.

²⁸ The exact wording of this specification will be discussed with DFID and CARD-F. One proposal is to specify that “household” covers the number of family members with whom the interviewee regularly eats dinner.

4.0 Poultry value-chain midline 1 findings

4.1 Poultry sector assessment

4.1.1 Recommendations

The midline 1 surveys were an opportunity to look at the provincial poultry markets at a specific moment, illustrating the impact of cross-border issues on both production and consumption. The results below give insights on the impact of such events, which might reoccur in the coming years, and also highlight internal value-chain bottlenecks and opportunities for CARD-F to mitigate their impact.

Overall, actors face important challenges at each step of the value-chain, especially around some key points of the Theory of Change. If producers, including CARD-F's beneficiaries, already manage to produce in sufficient quantities to ensure financial viability, the supply and distribution channels show some areas of significant weaknesses where the CARD-F programme could act.

Cross-border issues have a significant impact on prices and consumption. It therefore constitutes a significant risk to the continuity of domestic production. However, **developing a tight network of local input producers** would mitigate the impact of border closings, allowing domestic producers to replace imports during closures, and potentially replace those imports over time. This would require significant improvements in both the actual and perceived quality of domestically-produced inputs. CARD-F is in a strong position **to enforce quality standards among input producers benefitting from and selling to the programme** as well as to provide a steady market for those producers.

CARD-F's hatcheries and breeders should be operational in both provinces to fulfil part of the demand by the end of 2017. Herat's beneficiaries stated that they had not attended any training, as these training sessions took place in Nangarhar in previously-established facilities. **Proposing tailored initial training sessions and technical assistance to these hatcheries and breeder farms** over the next months, **eventually in-house**, should be of utmost importance to ensure the successful entry of these facilities in the market.

Developing a network of in-country input producers will also require **enhancing the offerings of already existing feed mills**. The programme could play a key role through associations by **sourcing better quality raw inputs for these facilities**, eventually from outside the country through stable trading routes (such as the western and northern borders instead of Pakistan)²⁹.

Besides the development of local input production, presenting ways for beneficiaries to bypassing major traders to acquire inputs would enable these producers to purchase and sell at better prices. **Offering cash-management training and rural credit options following Islamic standards** could allow them to directly purchase inputs and thus mitigate the control major traders have over input quality and selling prices. **These solutions will be efficient if newly created association can play a role in diversifying supply and distribution channels beyond the major traders**. However, it should be noted that this could have knock-on effects in the market overall, given the large role existing traders play both in ensuring the availability of inputs as well as supplying retailers.

Finally, midline 1 highlights an additional improvement opportunity within CARD-F's extension activities. Several beneficiaries have undertaken some important investments to improve the initial CARD-F's design of their farm. To avoid any unnecessary investments, **initial training with existing grantees should consider an extensive explanation of the facilities' design**. If any new grantees are to be considered, conceiving an agile approach, **where designs are based on a co-conception with beneficiaries**, would ensure both avoiding extra investments from grantees and continuous amelioration of farms' designs.

²⁹ However, the financial viability of such imports should first be validated.

4.1.2 Market Characteristics

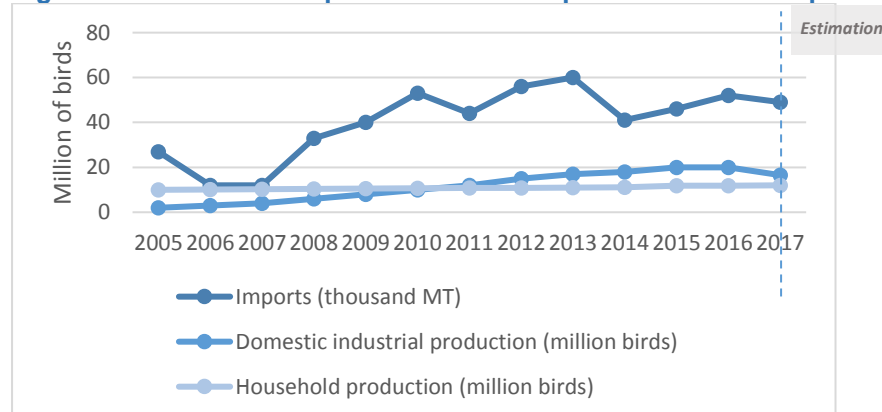
As described in the baseline report, Afghanistan's domestic poultry industry has shown signs of growth over the past decade. The sector is shifting from domestic production limited to small-scale farming for home consumption to an industrial production supplying part of the national demand due to the efforts of donor, government programming as well as private initiatives³⁰.

3.1.2.1 Market evolution

The Afghan poultry market has been characterised by erratic but constant growth over the past decade, mainly due to the development of domestic production capacities. At the time of the baseline, the overall volume of poultry meat traded in Afghanistan was approximately 65,000 metric tonne (mt). Of this, 46,000 mt (71%) were made up of imports, primarily packaged frozen meat³¹. Domestic production amounted to 28 million birds annually, of which 20 million were birds raised for commercial meat purposes, for both large industrial operations and smaller commercial production. While MAIL reports of domestic poultry numbers have remained constant³², this number is likely extrapolated from previous reports, reflecting consistent household production, while excluding significant commercial development. An additional 910,000 birds were raised for commercial egg production, producing 250 million marketed eggs annually (49% of the egg market)³³.

Since the baseline, this increase of consumption has been confirmed by recent statistics. As shown in Table 7, over the last year (2016), UN Comtrade reported an increase in imports from 46,000 mt to 52,000 mt. Meanwhile, local production capacities increased slightly, in part due to CARD-F's intervention as well as private investments.

Figure 1: Evolution of Imports and national production level of poultry meat over 12 years³⁴



3.1.2.2 Impact of cross border issues

At the time of the midline 1 survey (March 2017), the border with Pakistan had been closed for a month due to political disputes over a variety of subjects³⁵. At the same time, the Iranian border was closed for three months to live poultry product imports to contain an epidemic of H5N8 flu virus spreading among Iranian flocks, which slowed down the sector growth³⁶.

These events had several effects on the Afghan poultry market. First, due to the lack of inputs, most domestic broiler farms had to pause their production, reducing the number of annual cycles from 5 to 4. Accordingly, the volume of domestically-produced hens is expected to decrease from 20 million to 16.5 million in 2017. Second, prices increased, largely due to the shortage of poultry products in the market. Prices nearly doubled during the first months of 2017, offsetting the decrease in total value of

³⁰ 95% of interviewed commercial farms (42 farms) at baseline and 100% of interviewed commercial farms (10 farms) at midline had not received support from the government nor from donors and were solely financed by private investments.

³¹ UN Com Trade, export declaration to Afghanistan of Poultry meat products from partners 2005 to 2017.

³² 11.8 and 11.9 million birds reported successively in the last 2 years by the Afghan Central Statistics Organisation (CSO).

From the Afghanistan Statistical Yearbook 2015-2016, Agriculture Development Section from cso.gov.af

³³ Altai Consulting estimates from baseline and midline fieldworks and consumer surveys (August 2016 – March 2017),

³⁴ Sources: triangulation of UN Comtrade CSO as well as Midline fieldwork and consumer survey.

³⁵ See for example, *Tolo News*, "Torkham Closure 'Damaged' Pakistan's Reputation", 21 March 2017.

³⁶ *ITP News*, "Iran's Egg Export Hard to Crack Despite Bird Flu Containment", 17th of May 2017.

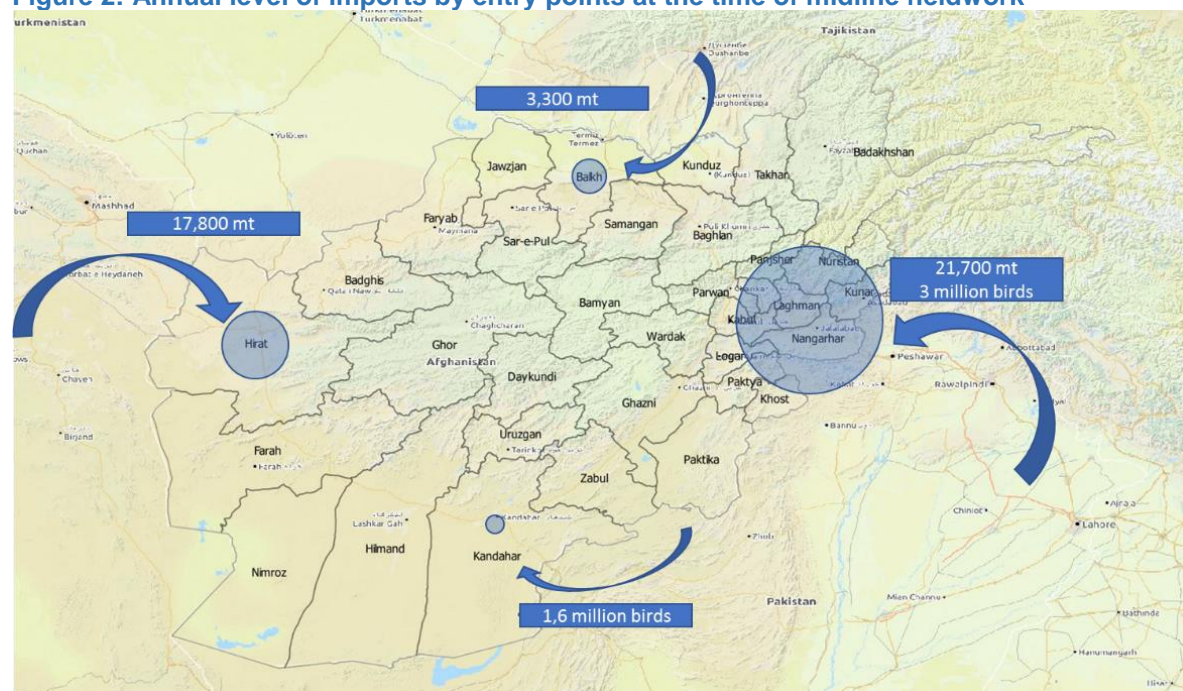
national products traded. Finally, it is furthermore expected that imports will decrease by approximately 2,000-3,000 mt in 2017³⁷.

Disruptions of cross-border trade highlight opportunities and bottlenecks, which can be taken into account by CARD-F's management and implementation teams over the course of the programme.

3.1.2.3 Situation in the targeted provinces

Herat and Kandahar provinces, foci of the CARD-F poultry intervention, remain major centres for the Afghan poultry trade despite frequent disruptions of the cross-border poultry trade with Iran and Pakistan. This is primarily due to their large urban populations, as well as their geographic situation as major international and domestic trading hubs.

Figure 2: Annual level of imports by entry points at the time of midline fieldwork³⁸



Herat remains a major corridor for imports, predominantly of frozen poultry from Iran³⁹, but with a significant decrease in import volume since the baseline⁴⁰. This effect coupled with an increase of domestic production lead to a positive trade balance. Indeed, Herat's own domestic facilities, which have been constantly growing over the past years, experienced a smaller decrease in volume than imports between the baseline and the midline⁴¹. Herat's egg production capacity actually increased over the past months (+2.4%). Local eggs represent 77% of the provincial market share in volume and 81% in value (against 64% in both value and volume at baseline).

Kandahar's poultry trade is comparatively smaller and remains the fourth point of entry of poultry products in the country, just behind Balkh⁴². The province is a secondary route for imports from Pakistan⁴³, representing 35% of live birds imported from Pakistan and 5% of overall Afghan poultry imports. Likewise, imports decreased in both volume and market share to the benefit of local

³⁷ From 52,000 to 49,000 mt. Estimates are based on two assumptions. First, imports were limited for a month and almost inexistent for Pakistani products. Second, prices and consumption habits were affected during two months by border closures and then stabilised at levels closer to the one recorded during the baseline survey.

³⁸ Sources: triangulation of UN Comtrade (<https://comtrade.un.org/data/>), CSO (<http://cso.gov.af>) as well as midline 1 fieldwork and consumer survey.

³⁹ Although imports come through the Iran/Herat border crossing, there are various original sources, with a significant quantity coming from the US (60%) and from Brazil (20%).

⁴⁰ -13% for meat and -46% for eggs.

⁴¹ Herat's poultry meat production went down by only 11% in volume. Domestic production accounts for 32% of the provincial consumption in terms of volume and 36% of its value, compared to 31% and 34% respectively at the time of the baseline. Assuming 20% of the local production is exported to neighbouring provinces.

⁴² 3,000 MT equivalents in live birds in Kandahar against 3,300 MT in Balkh.

⁴³ The larger portion of imports enters through the border crossing in Nangarhar.

producers⁴⁴. As local production remained stable in Kandahar (2.9 million birds annually through 4 cycles of production), it represents 54% of the local market in volume and 64% in value, compared to 52% and 60% respectively at the baseline. New layer farms added a production capacity of 2.4 million eggs per year, thus increasing the total capacity of production of the province from 13.5 to 15.9 million eggs—30% in volume and 35% in value of the provincial market. Table 8 summarises changes between August 2016 (baseline) and March 17 (Midline 1) in domestic production and import for poultry meat, live birds, eggs and their total market value between Kandahar and Herat (where relevant)

Table 7: Total Annual volume and value of imports and domestic production of Afghanistan at baseline (August 2016) and midline 1 (March 2017)⁴⁵

Product	Baseline		Midline 1 ⁴⁶	
	Domestic production	Import	Domestic production	Import
Poultry meat (mt), Afghanistan	-	42,443	-	43,837
Herat	-	20,455	-	17,858
Kandahar	-	-	-	-
Live birds (million), Afghanistan	20	2.1	16.5	4.7
Herat	5.8	-	5.3	-
Kandahar	2.9	1.7	2.9	1.6
Eggs (million eggs), Afghanistan	250	354.6	259.5	262.3
Herat	111.7	31.3	114.4	16.8
Kandahar	13.5	40.8	15.9	37.8
Market value (USD), Afghanistan	101,617,647	126,723,198	93,818,382	121,809,998
Herat	35,416,919	39,626,137	36,927,516	34,479,360
Kandahar	8,970,882	8,701,887	8,207,206	8,711,792

4.1.3 Sector Structure

Production of poultry meat in Afghanistan has traditionally been predominantly for home consumption. As recently as 2004, reports were recommending large-scale investments to develop commercial production in an undeveloped industry⁴⁷. A number of programmes, including CARD-F, have subsequently provided support for commercial poultry production, leading to rapid growth in many areas of the sector.

Over the last eight months, the construction of most of CARD-F financed facilities has been finalised. Once fully realised, the scale of the operation could significantly impact the production level in the two provinces of study. However, two main challenges can be highlighted along the value-chain in both provinces.

⁴⁴ The volume of live birds' imports went down (-6%), as did eggs imports (-7 %).

⁴⁵ Sources: triangulation of UN Com trade), CSO as well as midline 1 fieldwork and consumer survey.

⁴⁶ 2017 estimates – Taking into account border closing impact.

⁴⁷ E.g. USAID (2004), Rebuilding Agricultural Market Programmes (RAMP), April 2004.

Figure 3: Identified bottlenecks along the poultry value-chain

Table 9 presents the different bottleneck for each step of the poultry value-chain. Two impediments stand out from the others. The first one is the lack of domestic input providers, which significantly limit the independence, sustainability and possible expansion of domestic production. CARD-F grantees producing inputs have not started their activities at this stage. Layer and broiler farms are vulnerable to price increases and input scarcity.

The second one who sits after the production stage. CARD-F birds and eggs producers could represent a significant part of the domestic production in the coming years given their production capacities, beneficiary profile and financial results. However, they remain vulnerable to large domestic producers that control several strategic points of the value-chain, including distribution channels which are limited in terms of actors and capacities.

3.1.3.1 Infrastructure

Over the last year, CARD-F has achieved most of its objectives in terms of construction in both provinces. The construction of these facilities generated a significant amount of revenue as well as mobilized several jobs temporarily, therefore spilling over into the construction sector GDP and labour, which are monitored expected outcomes of the programme⁴⁸.

In Herat, 45,000,000 AFN (670,000 USD) were invested by CARD-F along with 50,500,000 AFN (753,000 USD) by grantees themselves. 14 broilers farms, three layer farms, one breeder farm, and one hatchery were built. Between the baseline and midline 1 fieldwork, CARD-F contractors finalized the construction of the largest facilities in the provinces, including a breeder and a hatchery which will be the first day-old-chick producers in the provincial value-chain.

Construction of facilities is a low-margin undertaking, highlighting the necessity of programmes like CARD-F in creating market-ready enterprises. As illustrated in the baseline, profit is not necessarily guaranteed for construction companies hired by CARD-F. Early in the programme, these service providers were usually general contractors, construction companies with no value-added experience in building poultry facilities. Moreover, CARD-F's previous experience in Nangarhar did not prevent some losses at the beginning of the programme. Nonetheless, the construction companies interviewed stated their expertise increased over time and some mentioned continuing their activity in this sector throughout the country.

The construction of these remaining facilities between baseline and midline mobilised an average of 50 workers for a 4-months period, which represent a total of 4,200 man-days (see details in Table 8 and 9 below).

⁴⁸ E.g. "Sustainable growth in rural employment" and "Increase in rural income" in the Poultry theory of change (see Inception Report).

Table 8: Facilities built in Herat since the beginning of the programme

Type	Objective for year 1 (2015) ⁴⁹	Achieved at baseline	Achieved at Midline	Remaining
Broiler	16	9 – 5,000 birds	3 – 5,000 birds 2 – 10,000 birds	0 ⁵⁰
Layer	3	1 – 10,000 birds	2 – 10,000 birds	3 – 10,000 birds ⁵¹
Breeder	1		1	0
Hatchery	1		1	0
Feed mills	0			0

In Kandahar, investments were higher, with 70 billion AFN (1.05 million USD) invested by CARD-F along with 68 billion AFN (1.02 million USD) by grantees themselves. Between baseline and midline fieldwork, most facilities were built, or about to be finalized. Likewise, an estimate of 7,980 man-days were needed over the last eight months between the baseline and the midline fieldwork.

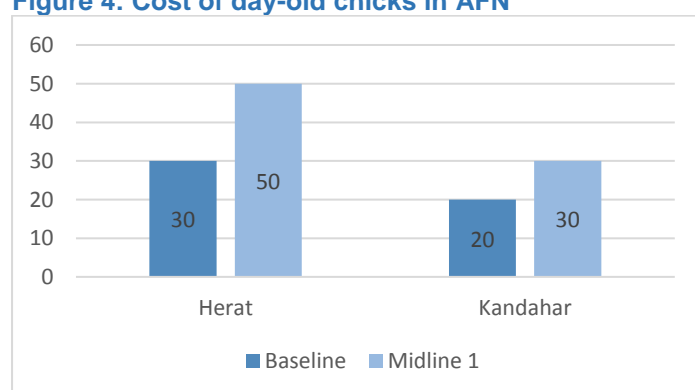
Table 9: Facilities build in Kandahar since the beginning of the programme

Type	Objective 2015*	Achieved at baseline	Achieved at midline	Remaining
Broiler	8 – 5,000 birds 1 – 10,000 birds	0	19 – 5,000 birds	3 – 5,000 birds 2 – 10,000 birds
Layer	1	0	0	2
Breeder	2	0	0	2
Hatchery	2	0	0	2
Feed mills	-	-	-	0

* As per economic and financial appraisal

3.1.3.2 Inputs

Raising chickens for slaughter requires day-old-chicks, which require a minimum amount of feed and drugs to ensure growth throughout a 50-day production cycle. Inputs vary in price and quality depending on the bottlenecks noted. This includes the lack of domestic producers and service providers, in both numbers and quality. These challenges have often been exacerbated by border disruptions, which create significant price increases and shortages for day-old-chicks and drugs (see table 12 below).

Figure 4: Cost of day-old chicks in AFN

Day-old-chicks

Day-old chicks are still mostly imported⁵². In Herat, only one newly-established, privately-funded hatchery was identified at the time of the midline⁵³. One CARD-F funded breeding and hatching farm

⁴⁹ Programme logframe objective.

⁵⁰ CARD-F considers that the 10,000-bird capacity farms account for 2 farms from the initial target.

⁵¹ Currently under construction.

⁵² Chicks are mainly imported from Iran in Herat, and from Pakistan in the rest of the country.

⁵³ It had not started its activities yet due to the embargo on Iranian poultry products.

had started, but was under quarantine for the first 3 months of operation as per national regulations. No breeders or hatcheries could be found in Kandahar, and the facilities subsidized by CARD-F were still under construction at the time of the survey. This lack of domestic facilities remains a major impediment to a stable and steadily growing value-chain.

As at the baseline, day-old-chicks were more expensive in Herat than in Kandahar, but prices increased significantly in both provinces (see table 12 above). According to input market actors, this price increase came from changes in the foreign businesses sourced. Indeed, importers adjusted their selling prices to fit the changing purchasing costs due to the need for alternative trading routes and plane shipping.

Due to shortages, most Herat producers are in 2017 reducing from 5 to 4 production cycles. Import volumes for inputs should consequently decrease from 5.6 million to 5.1 million day-old-chicks annually in Herat. Most Kandahar farms, which only completed 4 cycles of production per year in August 2016, should import a steady number of day-old-chicks (2.8 million annually), as they plan to now produce during a time period where they had previously been inactive.

Feed

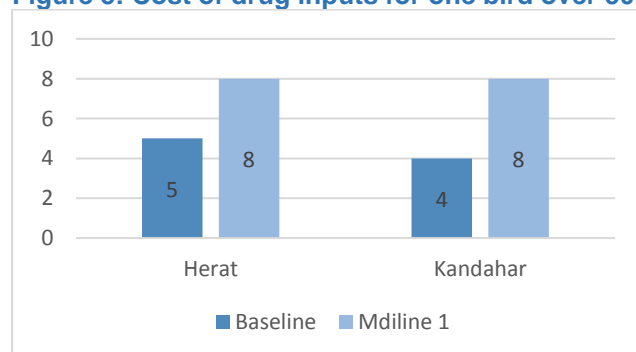
The main input costs during the production process are linked to feed. Unlike day-old-chicks, feed was present in sufficient quantities to cover the needs of the market at the time of the survey. However, this can be explained by the lower demand for feed since a significant number of commercial farms had paused their production. Hence, prices remained quite similar and stable from baseline to midline 1 (see table 13 below), or even decreased in some cases due to the lack of demand⁵⁴.

A typical bird will consume roughly 4 kg of feed over the course of their lifetime at a total cost of 120 AFN (1.7 USD) in Herat. Birds in Kandahar, being smaller⁵⁵, will consume 3 to 4 kg of feed at a total cost of 75 – 120 AFN (1.1 – 1.7 USD). Local feed is less expensive in Kandahar than in Herat, but is also considered to be of lesser quality.

There are four feed mills in Herat and three in Kandahar, one of which had just started its activities at the time of the midline. Herat feed mills have modern equipment, including laboratories for testing product quality. whereas in Kandahar, the two feed mills still lack the means to invest in better infrastructure and develop production capacity. At the time of midline 1, feed mills in both provinces reported producing at two thirds of capacity and represented 10% of the market.

While domestically-produced feed is available, quality is still perceived to be poor, particularly in Kandahar⁵⁶, with. In addition to the obsolete infrastructure, feed mills also state quality issues stem from the difficulty of sourcing proper inputs in Afghanistan (such as soya, specific proteins or vitamins). In most cases, imported feed is still preferred, explaining the low market share of local producers.

Figure 5: Cost of drug inputs for one bird over 50-day production cycle



⁵⁴ Prices were the same as at baseline in Kandahar and in Herat. Most farms had stopped their production at the midline due to day-old-chick shortage.

⁵⁵ Producers justify the different size by various reasons including origin of day-old-chicks, different type of feed used and shorter cycle to sell the flock faster and avoid the risk of diseases spreading to the whole flock.

⁵⁶ Poultry producers in both provinces stating it is of poor nutritional quality and a source of disease.

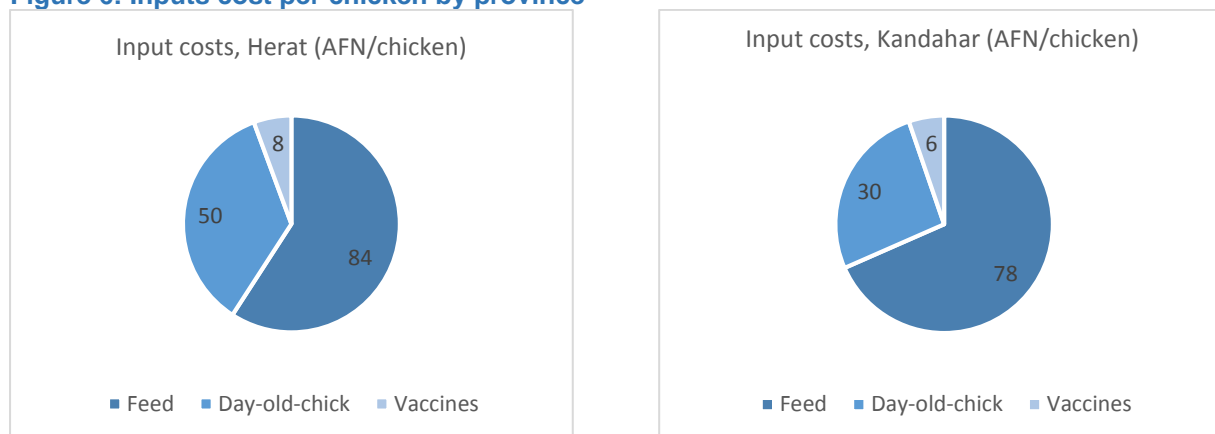
Drugs

As control of disease presents a significant challenge, the purchase of medication represents a consistent if minor additional cost for producers⁵⁷. As with day-old chicks, prices increased in both provinces due to the border closings (see table 13 above). Vaccines were available from three main sources: from veterinary field units from the local Development Agriculture, Irrigation and Livestock (DAIL) and from the retail market, including the same regional traders who provide feed⁵⁸. As with feed mills, veterinary facilities in Herat tend to be better developed than those in Kandahar.

The availability of experienced health service providers is progressively improving in both provinces, with a new CARD-F-subsidized clinic now operating in each province. Both grantees had prior experience in poultry and implementation was quick, with five months from the start of the selection process to the beginning of operations. The newly-implemented CARD-F clinic in Kandahar is presently the only one specialized solely on poultry in the province, doing analysis in its own laboratory and operating across the whole province. After four months of activities this CARD-F clinic declared a number of clients nearly equal to previously established clinics and a net income higher than competitors⁵⁹. However, the clinic was unable to provide the evaluation team with a detailed structure of costs and revenues to confirm these numbers.

As shown in Table 14 below, feed price is higher in Herat than in Kandahar whereas Day-old-chick price is higher in Herat and Kandahar. However, price of the vaccines is quite similar.

Figure 6: Inputs cost per chicken by province



Bottlenecks in the supply chain

The supply portion of the value-chain presents several weaknesses that have yet to be addressed. The lack of local production is a challenge for the entire value-chain, especially when international imports cannot reach the market. This issue is only partially resolved by CARD-F's current investments.

- Developing domestic facilities supplying the market with local day-old-chicks is a major challenge of the CARD-F project. Without these facilities, producers cannot be independent from international trade and its price variations. At midline 1, CARD-F's subsidized facilities had not started their operations. Whether these facilities are successful during their first months of activity will be examined at the second midline survey (summer 2018).
- At the moment, providing producers with local, high-quality feed has not been addressed by the CARD-F programme. Local feed mills have not been able to fill this gap, and would need to improve the quality of their production in order to replace imported feed.
- Finally, offering operational local and specialized poultry health service providers is a significant step forward taken by CARD-F since the baseline. Whether these providers are able to respond

⁵⁷ An average of roughly 6 (0.09 USD) to 8 AFN (0.11 USD) per chick over the production cycle.

⁵⁸ All in all, 100% of interviewed farms state they rely on a clinic or another health service provider located in the provincial city centre.

⁵⁹ 10,000 AFN, or 150 USD of monthly net income against an average net income of 6,500 (97 USD) for non-CARD-F clinics.

to demand with quality service will to be assessed during the midline 2 survey, when the two clinics are more established.

3.1.3.3 Production

In 2014, there were an estimated 4,770 commercial poultry farms operating in Afghanistan—approximately 95% meat producing broiler farms, and 5% egg production⁶⁰. At midline 1, number of farms was estimated to have stayed stable, though the total capacity of these farms has increase due to the exit of small-scale farms and the creation of larger facilities. Broiler farms can be classified roughly into three categories based on production capacity: (a) up to 30,000 chickens per cycle; (b) up to 10,000 chickens per cycle; and (c) up to 5,000 chickens per cycle. A cycle lasts between 45 to 60 days per batch, allowing time for cleaning, re-stocking and growing.

There were approximately 200 broiler farms at the time of the baseline in both Herat and Kandahar, although capacity varied greatly between the two provinces. Additionally, these farms were impacted by cross-border issues, which led to price increases and input shortages (noted above). Surveys confirm CARD-F's beneficiaries are competitive with other producers of comparable size; however, they are unable to match the profit of larger producer, who benefit from significant economies of scale. There are also opportunities to offer improved tailored extension and training services over the course of the programme.

CARD-F impact on the provincial market

Broiler production

In Herat, there are the following non-CARD-F boiler farms: four category (a) farms, 50 category (b) farms, and 150 category (c) farms. Each cycle lasts between 45-50 days, with a typical five cycles per year, resulting in a maximum capacity of 5.6 million live birds produced per year. However, farms were operating below maximum capacity at the baseline, due to lack of funding to procure inputs, imports competition, and mortality among birds. This lead to an actual production closer to 5.6 million birds per year. This production is expected to be lower this year due to the border closings—several farms were waiting to restart their production at the time of the survey⁶¹.

Nevertheless, CARD-F's farms led to a considerable increase of the Herat market size. Since the baseline, 12 category (c) farms and two category (b) farms entered the market due to the programme, increasing the potential production capacity from 5.6 million birds to 5.2 million, thus representing 10% of domestic production. Aside from CARD-F, no new private investments were found at midline 1. Due to the cross-border issues, most producers were waiting to restart their production due to the unavailability of day-old-chicks. Recent border closings might therefore have prevented other potential investors from entering the market during the survey period.

Farms in Kandahar were considerably smaller than in Herat, had less cycles (four cycles of 55 to 60 days) and a smaller capacity production (3.2 million)—live birds annually. Actual production is closer to 2.9 million after taking into account a 10% loss from disease. This domestic production is mostly sold within province and represents 54% of market share in volume and 64% in value⁶². Likewise, CARD-F's grants had a significant impact on potential production capacities⁶³, increasing the potential production capacity of the province to 3.85 million live birds, thus representing 15% of the domestic production.

CARD-F's impact on egg production

Commercial layer farms tend to be smaller, with the majority holding up to 5,000 hens. There were approximately 240 commercial layer farms nationally, with few exceeding 5,000 hens at the time of baseline⁶⁴. In Herat, market size was relatively stable between the August 2016 baseline and midline 1 in March 2017. There are 60 layer farms, three of which have a larger capacity. The smallest of these farms holds 12,000 hens, and the largest 70,000, showing considerable variation across these larger

⁶⁰ World Bank Agriculture Sector Review, 2014.

⁶¹ Most producers in the province were considering 4 instead of 5 cycles annually.

⁶² Taking into account domestic industrial production and imports only while excluding household production in rural areas.

⁶³ 22 farms of a 5,000-bird capacity per cycle and two farms of a 10,000-bird capacity per cycle built over the last year,

⁶⁴ Altai Consulting estimates, based on fieldwork and consumption surveys in August 2016 (Baseline Report).

operations. In total, there are an estimated 447,000 layer hens in Herat. Unlike Herat, industrial egg production in Kandahar was estimated at close to 0 at the baseline. Considering new information gained in midline 1, the evaluation team has determined there were 10 farms of 10,000 hens already operating at that time. Over the last winter, two new layer farms counting around 4,500 hens have started their activities in Kandahar outside of the CARD-F programme.

In Herat province, CARD-F have already built five facilities, but only one has started its activities. One layer facility was still under construction at midline 1. In Kandahar, CARD-F was in the process of building two 10,000-hen farms at midline 1. Most of these farms had not started production at the time of the visit⁶⁵.

Since the baseline, production capacity in Herat has slightly increased due to CARD-F, with maximum production increasing from 111 to 114 million eggs annually. The completed CARD-F layer farm should be able to supply an additional 2.7 million eggs in 2017⁶⁶. As the Kandahar CARD-F layer farms are still under construction the programme has had no impact so far. Aside from CARD-F in Kandahar, the two privately-funded farms that started their activities a few months ago should produce around 2.4 million eggs annually, representing 5% of the local market and increasing the market share of local products from 25% to 30%.

Employment

Larger scale production naturally requires more overall resources. However, contrary to what was found at the baseline, large scale poultry operations require similar human resources. A broiler farm with a capacity of 5,000 chickens (category c) per cycle will be operated by two to three people, which is similar to the number required for larger facilities (category a)⁶⁷. As CARD-F subsidized more small category (c) farms and fewer large category (a) farms, the programme optimized its investment in terms of number of Full-time employment (FTE) generated⁶⁸. The number of jobs generated is similar in a layer farm.

In Herat, this implies the creation of 47 FTE and approximately 10 indirect jobs across the farms, given CARD-F's assumptions.⁶⁹ As Kandahar grantees had not started operations at the time of the survey, the number of FTE generated by the province will have to be assessed at midline 2. Based on Herat averages, it could result in the creation of 75 FTE within the large-scale facilities (including broilers, layers, breeders and hatcheries) and approximately 19 indirect jobs.

Given volumes handled by large traders and the human resources needed to undertake these activities, CARD-F's assumptions regarding the number of indirect jobs generated might be correct. This results in an estimated 1 indirect job created in trading companies for every 4 direct FTE created in the production facilities⁷⁰.

Broiler and layer farms challenges and opportunities

In Herat, CARD-F beneficiaries had both the financial means as well as the human resources needed to begin their production rapidly and efficiently (see timeline presented in Table 15 below). It took an average of nine months for beneficiaries to move from the selection process to production, with an average of six months taken to validate the grant and three months to finalize the construction.

⁶⁵ Though the selection process started two years ago, the construction of these facilities was not yet complete.

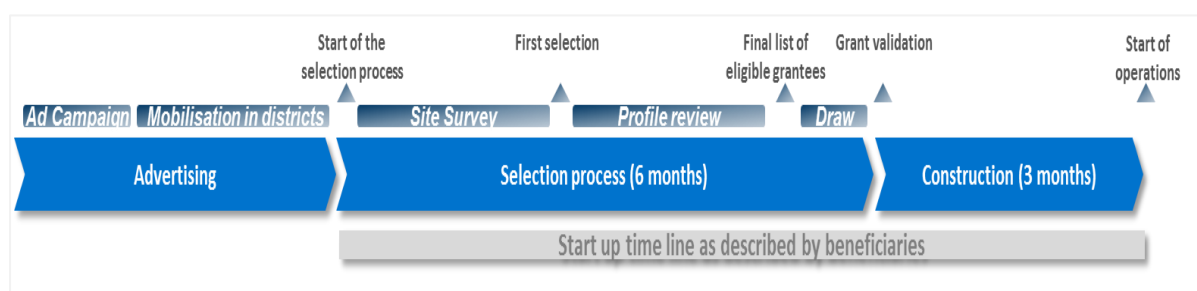
⁶⁶ It represents 2.3% of provincial production capacity.

⁶⁷ These jobs are typically based on cycles, with wages at a rate of 300 AFN per day. However, most of those working on smaller farms tend to be family members in the smaller class of production, thereby reducing expenditure on wages.

⁶⁸ E.g. "Jobs are monitored by CARD-F following the full-time equivalent employment principle, assuming 245 days of work in a year, for 8 hours per day" (Inception Report, p28).

⁶⁹ CARD-F's assumptions are that one indirect job is created for every four CARD-F jobs.

⁷⁰ This estimation is based on job creation in trading companies and does not take into account the impact of the money generated that is reinvested in the economy.

Figure 7: Farm start-up time line in Herat

Farm owners often rely on workers on the Herat labour market to manage activities that often have several years of experience in the sector, either in Afghanistan or in larger industrial facilities in Iran. At midline 1, most employees had already benefited from CARD-F's training on both production and marketing.

However, technical construction and marketing issues hindered the first months of activities for these Herat farms. The Nangarhar broiler farm design had been adapted to Herat weather conditions, including different windows and an enhanced exhaust system. However, most producers felt that the CARD-F designs were too limited and were not fit to start production without additional investments from the owner.

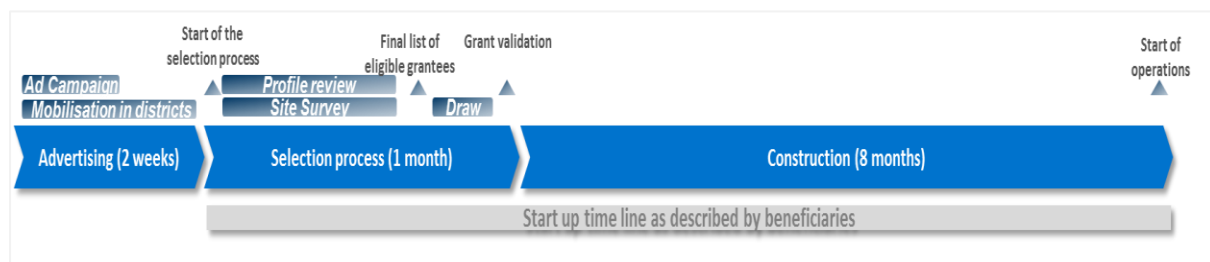
These investments include larger annex rooms for complementary facilities (namely, feed mixers and feed pumps), new windows to adapt a ventilation system which is inefficient during the Herat windy season, and adding resting areas for employees. These farms also lack fit-for-purpose infrastructure, including electricity, leading owners to invest in solar panels. However, these panels only provide enough power for smaller activities and do not allow for the operation of large automatized facilities on a day-to-day basis. Finally, most beneficiaries had not invested in cooling systems at the time of the survey and were considering pausing their production during the summer rather than making additional investments this year. On top of technical considerations, owners felt they could not rely on the CARD-F association for assistance with market linkages.

Picture 1: A broiler farm beneficiary, using solar panels in Injil district, Herat



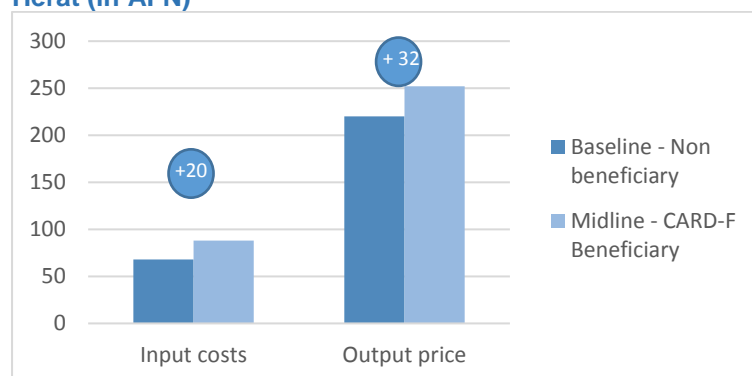
In Kandahar, the CARD-F selection process was quick, with most beneficiaries selected within one month following criteria fit to a previously set objectives: the owner must have his own land in a secure area close to necessary infrastructure, invest a set amount, and have experience with poultry (see timeline presented in Table 16 below). Nevertheless, construction of most facilities took longer than expected, with an average building time of eight months. This was due to the lack of raw materials and supply chain difficulties in the province.

Therefore, Kandahar beneficiaries were not able to provide any information regarding their structure of cost and revenues at midline 1. As such, the following analysis of broiler farm financial results could only compare CARD-F's farms with other commercial farms in Herat province.

Figure 8: Kandahar Farm start-up timeline**CARD-F broiler farm sustainability in Herat**

As noted at the baseline, the average margin for a non-CARD-F supporting 5,000-bird broiler farm was around 1,600 AFN (24 USD) per hundred birds in a cycle⁷¹. CARD-F farms interviewed at midline 1 in Herat, which were approximately the same size⁷², displayed better margins, with an average net income of 3,000 AFN (45 USD) per hundred birds (see Table 18 below).

Throughout the year, the total net income of 5,000-bird farm at the baseline over five production cycles was 250,000 AFN to 300,000 AFN (3,600 to 4,400 USD). At midline 1, the potential annual net income for a CARD-F farm of the same size was of 360,000 AFN (5,375 USD)⁷³. These results do not necessarily indicate that CARD-F's farms are more efficient than other farms of the same size, but rather that the border closing did not necessarily have an impact on financial results of these farms. Indeed, the increased selling price allowed producers to compensate for the reduction from five to four cycles per year. While input prices raised by 20 AFN (0.29 USD) for one bird⁷⁴, the selling price of birds to traders increased by 30 AFN (0.45 USD) per bird⁷⁵ due to the closed borders (see Table 17 below).

Figure 9: Evolution of input costs and selling price of birds for a 5,000 bird broiler farm in Herat (in AFN)

However, CARD-F beneficiaries are unable to effectively compete with larger industrial farms in the market. As presented in Table 18 below, some of the 50 non-CARD-F farms raising 10,000-30,000 birds were able to leverage considerable economies of scale on utilities and wages.

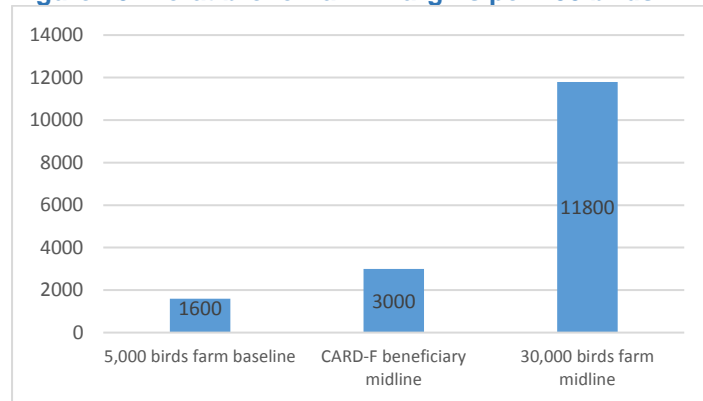
⁷¹ Most non-beneficiary farms this size were not producing at the time of midline 1.

⁷² The average flock size of interviewed farms was of 5420 birds per cycle.

⁷³ Assuming that prices went down after borders reopening and financial results collected during baseline are only valid for one cycle out of four.

⁷⁴ The cost rose from 68 AFN (1.01 USD) to 88 AFN (1.40 USD) per bird.

⁷⁵ The selling price rose from 220 to 250 AFN. (from 3.28 to 3.73 USD)

Figure 10: Herat broiler farm margins per 100 birds in AFN⁷⁶

In addition to economies of scale, these producers managed to both limit their input costs and sell at a better price. This was not due to any internal factors but resulted from their specific positioning in the market. Indeed, most of the time these larger producers are operating actively on a large-scale across several steps of the value-chain as input traders, service providers and end products traders. This enables them to limit their off production costs and optimizing their margin. More details on this is provided in the next section (Processing and Marketing)⁷⁷.

Table 10: Baseline vs. midline 1 costs and revenue for 100 birds raised in a 1000 sqm broiler farm raising ~5000 chickens per cycle in Herat

		Cost and revenues for 100 birds raised in a 1000 sqm broiler farm raising around 5000 chickens per cycle in Herat at the baseline			Cost and revenues for 100 birds raised in a 1000 sqm CARD-F broiler farm raising around 5000 chickens per cycle in Herat at the midline			Cost and revenues for 100 birds raised in a broiler farm raising around 30,000 chickens per cycle in Herat at the midline		
Variable	Unit	Price	Quantity	Total	Price	Quantity	Total	Price	Quantity	Total
Direct costs										
Operating costs										
Feed	AFN/kg	32.5	400	13,000	34,5	395,19	13,603	30	317	9,500
Drugs	AFN/bird	6	100	600	10,60	100	1,060	9,63	100	963
Day-old-chicks	AFN/bird	30	100	3,000	40	100	4,000	45	100	4,500
Utility	Cost/100 birds	-	-	1,000	3,25	100	325	13	100	1300
Labour										
Manager	AFN/100 birds	-	1	400	-	1	264,9	-	1	60
Employee	AFN/100 birds	-	1	200	-	1,5	235,4	-	1,5	84
Total				15,500*			19,489			16,407
Sales										
Chicken	AFN	220	90	19,800	251,8	89,6	22,539	325	86,5	28275
Margin				1,600			3,049			11,868

3.1.3.4 Processing and marketing of poultry products

As noted at the time of the baseline survey, both the processing step and the distribution channels of the value-chain are concentrated around a few major participants in each province. This situation raises

⁷⁶ 16 000 AFN = 239 USD, 3000 AFN = 45 USD and 11800 AFN = 176 USD.

⁷⁷ While it is complex to conduct a similar analysis in Kandahar where no CARD-F farm had started its activities at the time of the midline, revenue declarations from non-CARD-F beneficiaries show that net incomes are still relatively lower in this province compared to Herat with a net income per hundred birds under 1,000 AFN (14.7 USD).

questions about several assumptions of the theory of change, both at the supply chain and distribution level.

Processing

Domestic processing of poultry products remains minimal, largely limited to butchers providing slaughtered rather than live birds. Only a few traders, who generally also offer several services along the value-chain, also run a slaughterhouse, with limited capacity. While a substantial proportion of consumer purchased poultry is processed, these are mainly imported products. There are several reasons for this, including lack of necessary facilities and a preference for fresh meat to be butchered in the consumer's presence to ensure it is halal⁷⁸.

The same observation regarding limited processing and packaging can be applied to eggs. Most of the time Afghan eggs are only packaged in second hand boxes from Iran in Herat and from Pakistan in Kandahar.

Traders' role in the value-chain and market access difficulties

At the baseline, it was estimated that 175 major traders operated across Afghanistan, with 20 in Herat and 35 in Kandahar⁷⁹. At midline 1, this number remained stable in Herat. However, only 24 could be identified in Kandahar, marking a substantial decrease. This is likely attributable to the border closures creating difficulty for traders, and further study will be needed to determine if this is a long-term phenomenon.

Most of remaining traders are large companies operating across most levels of the value-chain. They deal in poultry inputs as well as ready-for-market chickens. This allows them to provide inputs on credit to secure their purchase of grown chickens. This arrangement remains the main approach for most producers to finance their activities. The advantage is that it provides cash-strapped producers with needed credit, however it limits producers' choices on the type, quality, and price of inputs as well as the point of sale. This type of arrangement does not necessarily lead to a higher price for inputs. However, because traders receive part of the gross profit from the sale, it has an impact on the overall profit of the producers.

Additionally, some traders in both Herat and Kandahar not only supply to and purchase from local producers, but also are present at every part of the value-chain as suppliers, producers, traders, and members of poultry associations. These vertical concentrations could prove to be a barrier to developing activities in both provinces, especially at the marketing stage. However, a large network of small retailers currently exists in every province, with an estimated 100-150 retailers selling poultry products in Herat and 250-300 in Kandahar. As illustrated in Table 20 below, the vertical concentration is around big traders, with smaller farms being stuck with only small number of contact points to source inputs. In addition, they sell their products to other large producers.

Figure 11: monopoly situations in the targeted provinces



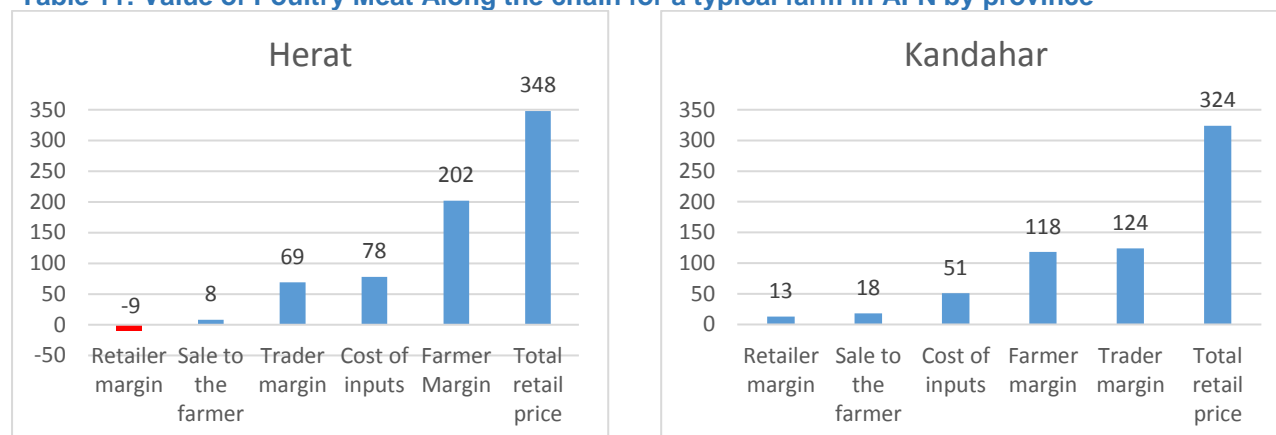
Border closing induced prices changes in both provinces since the baseline. Retailers were sometimes selling at loss after buying at the peak of the shortage. These as borders can be closed several times over the year, they need to be analysed as regular market-affecting events.

⁷⁸ As explained in section "Demand and consumption" price preference pushes poorer households and restaurants to purchase already-processed imports.

⁷⁹ This estimate is based on interviews with major traders, associations, and government officials in Herat, Kandahar, and Kabul. In making this estimate we have tried to account for overlap created by traders who work in multiple markets. While the estimate for major traders in Herat and Kandahar is accurate, the number of traders nationally may be over-estimated due to this overlap.

As shown in the table 21 below, border closings primarily benefited domestic producers and middle men (such as traders⁸⁰), while significantly reducing retailers' profit margins. The scarcity in inputs resulted in higher prices along the value-chain up to the retail level, but retailers had difficulties fully passing the price increase along to their customers, and thus had to reduce their margins.

Table 11: Value of Poultry Meat Along the chain for a typical farm in AFN by province



3.1.3.5 Demand and Consumption⁸¹

At midline 1, household consumption of poultry products within Afghanistan were estimated at 14.6 billion AFN (215 million USD) annually, compared with 15.5 billion AFN (224 billion USD) at the time of the baseline survey. This is without taking into account local backyard production in rural areas, which represent a third of the domestic industrial production, for an estimated 30 million USD in value⁸². As explained earlier, poultry product consumption temporarily decreased in the beginning of the year due to border closings leading to a price increase and produce shortage. However, consumption habit patterns remained similar to baseline findings.

Nationwide consumption levels and habits

Nationwide, most households consume poultry products. Of 550 households interviewed, only nine (1.7%) reported that they do not purchase poultry products. Among these nine, eight stated that they do not because they themselves raise birds at home⁸³. Only one mentioned issues with quality, and none mentioned price. These midline 1 results mirror the baseline findings and confirm that poultry product purchases are now a well-established practice among Afghan urban populations⁸⁴.

Survey results suggest that the current level of poultry consumption is still increasing:

- 77% of midline 1 respondents state that their household purchases poultry meat once a week or more frequently, including 12% who purchase poultry meat on a daily basis. This compares to 72% and 7% at the baseline, respectively. Likewise, 93% of survey respondents stated that they still purchase eggs at least once per week (87% at baseline). This is largely due to their low price and easy availability when borders are open.
- 21% of respondents at the baseline and 18% at the midline stated that they purchase eggs in lesser quantities in spring and summer due storage and quality issues, which indicates

⁸⁰ However, after the sale of their current cycle of production, most producers had to stop their activities for a few weeks, due to the unavailability of raw material in the country and thus limiting the increase of revenue generated by this price burst.

⁸¹ Unless otherwise noted, consumption data in the following section is based on results of the poultry consumer survey conducted for this research. This was a phone-based survey, which allowed for a greater geographic reach within the time and resources available than would be the case for a ground survey. However, it should be noted that this method likely excludes households on both the low and high ends of the income spectrum, and so households with little to no consumption (or subsistence-based consumption) as well as households with extremely high consumption likely exist but are not captured within this data.

⁸² Altai estimates based on consumer surveys, fieldwork interviews, domestic production capacities and 2016 UN Com trade data.

⁸³ Note that phone surveys include a bias by reaching mostly urban populations and does not give a complete picture of rural practices. In 2014, the World Bank estimated that more than three quarters of Afghan households keeping poultry at home.

⁸⁴ Baseline results: 1.2% of the sample stated that they did not consume poultry products.

a consistent trend across the population. Likewise, 10% claim to buy poultry meat more regularly during the winter months. If these seasonal consumption behaviours regularised, poultry produce consumption could expand even more across the Afghan population.

Provincial consumption levels

The demand for poultry products appears relatively stable, with the decrease in declared consumption likely due to the border closings at the time of the survey. The evaluation team estimates consumption has been affected by this phenomenon for only two months. However, even accounting for the effect of the border closures, demand remains much lower in Kandahar than Herat.

- In Herat the average person consumes around 2.3 eggs and 300gr of chicken meat per week compared with 3.2 and 1.1kg respectively 8 months ago, at the baseline. Yearly consumption went down from 29.8 MT to 26.3 MT of meat⁸⁵.
- Presently, people in Kandahar city consume an average 2.4 eggs and 100gr of chicken meat per person per week, a decrease similar to Herat⁸⁶. The average annual consumption should decrease slightly in 2017, to 5,361 MT of meat being consumed in Kandahar.

Imports vs. domestic production

Traded volume decreased significantly due to border closings. Domestic production will likely be reduced from 20 million to 16.5 million birds, due to input price increases and shortages. However, domestic production could increase rapidly if producers manage to run 5 cycles of production over the next 12 months.

Throughout Afghanistan, local products still have a good reputation, with 69% of consumers saying Afghan poultry is of better quality than imports. Most people buy domestically rather than buying imported products. 84% of respondents state that they buy live birds, which are typically local, while only 33% purchase packaged or frozen poultry meat which is mostly imported. However, this may prove to be misleading, as most sales in Afghan markets (typically between 60% and 90%, depending on the region) are still made up of imports. Based on domestic production capacities and UN Comtrade data, imports represent 68% of yearly national consumption with domestic production estimated around 25%. See Table 22 below).

Presently⁸⁷, Herat's domestic egg production of 114 million eggs annually covers more than local market demand (152%). Given the border closures affected consumption for two months, it is estimated that in 2017, 74 million eggs will be consumed in Herat; 83% of them local eggs called "Watani", considered fresh and sold for 9 to 10 AFN/egg, and with 17% "industrial" and imported, sold at 7 AFN/egg⁸⁸. These results confirm a long-time preference for local production⁸⁹, indicating that Afghans are willing to pay 30% to 40% more for "Watani" eggs than for industrial ones. The remaining local production is being shipped to neighbouring provinces. Around 39 million eggs produced in Herat are shipped to neighbouring provinces every year. Egg consumption in Kandahar went down from 54 million to 53 million eggs. However, local production now represents 30% of this, compared to 25% at the baseline, due to newly built privately funded facilities. This leaves potential for the further development of provincial production capacities to replace imports.

Market price for poultry meat is similar for the three categories of meat (processed, fresh slaughtered, or live meat) and increased overall across the country because of the border closings. On average, consumers declare paying 146 AFN (2.17 USD) per kg for frozen meat, compared to 249 AFN (3.8 USD) per bird. With a typical live weight between 1.5-2kg, this translates to 124-165 AFN (1.8 – 2.4 USD) per kg⁹⁰. Additionally, there are major price variations within all categories depending on

⁸⁵ Taking into account the industrial local production as well as imports, and leaving aside production for home consumption.

⁸⁶ If egg consumption remained the same, average meat consumption went down from 200gr to 100gr per person weekly.

⁸⁷ Reference to baseline results present major modifications compared to the initial delivered report due to estimation correction at the time of the midline.

⁸⁸ As used here, industrial eggs are eggs produced in big industrial farms in large quantities, packaged and marketed, as opposed to local traditional production.

⁸⁹ Altai Consulting (2005), *Market sector assessments – SME development for UNDP*.

⁹⁰ At baseline, consumers were respectively paying 130 AFN (1.91 USD) for frozen meat and 237 AFN (3.48 USD) for live birds

geographic location, point of sale, season, and quality, with average prices per province varying by as much as a factor of four.

Figure 12: Origin of poultry meat consumed in Afghanistan (2017 estimates)⁹¹

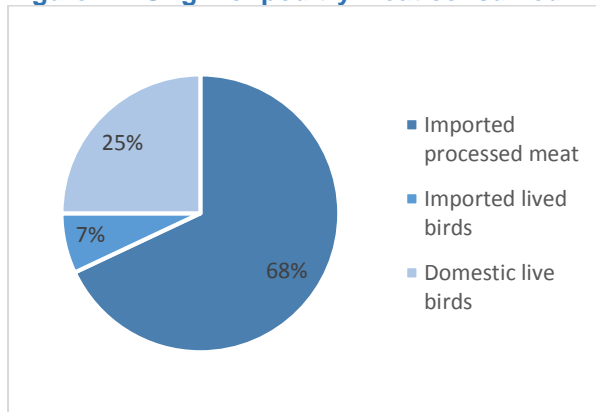


Table 12 summarises prices of processed and live poultry meat differ. As illustrated, prices vary widely among provinces.

Table 12 Poultry meat market price⁹²

Province	Processed (AFN/kg)	Live (AFN/kg)
Badghis	250	217
Baghlan	120	158
Bamyan	-	114
Farah	-	83
Herat	144	142
Jawzjan	120	286
Kabul	145	144
Kandahar	140	144
Kapisa	120	200
Khost	-	229
Kunduz	-	134
Laghman	-	143
Logar	130	149
Nangarhar	159	136
Nimroz	-	114
Paktya	-	114
Parwan	150	166
Takhar	150	286
Zabul	-	103
Average	146	142

Imports of mainly frozen processed meat still represent a significant part of the market share by value in Herat, with frozen poultry representing 66% of the market⁹³. However, at midline 1 imported poultry meat retailed around 144 AFN per kg (2.1 USD per kg, which represent an 8% increase in price since the baseline. Meanwhile locally-bred live birds are on average sold for 142 AFN (2 USD) per kg against 135 AFN (1.9 USD) per kilo at the baseline, which represents only a 5% increase. From early-2014 up through the end of 2016, price of imports remained stable at around 80% of the price of local products.

⁹¹ Altai Consulting estimates, based on Midline surveys and UN Com trade 2016. Note that most live birds weight between one and two kg, thus between 850 gr and 1.3 kg after being eviscerated. The market share is thus indicated here on the assumption than each live bird will give 1kg of meat.

⁹² Source: consumer survey.

⁹³ This frozen imported meat comes mainly from the USA, Brazil and Iran.

However, the recent increase in the price of imports could considerably ease the entrance of CARD-F producers into the poultry market this year.

In Kandahar, both imported poultry meat and local production prices increased as well⁹⁴. However, the price increases of local products have been higher than that of imports, thus cancelling any chance of price competitiveness.

⁹⁴ To 140 AFN (2 USD) and 144 AFN (2.1 USD) respectively, compared to 132 AFN (1.94 USD) and 125 AFN (1.83 USD) at the baseline

4.2 Poultry small-scale beneficiary survey findings

As noted in the Approach Section above, the small-scale poultry beneficiary data collection targeted both the 200 “rolling baseline” SSL beneficiaries added in Kandahar since the baseline, as well as 173 existing beneficiaries who were re-interviewed for midline 1. No further rolling baseline surveys will be collected in the future. Compared to the baseline survey, due to the improved security situation in Kandahar, female enumerators were now able to directly interview female beneficiaries⁹⁵.

The shift to using female rather than male enumerators in Kandahar provides an insight into the different perceptions of men and women in answering a range of questions. For instance, regarding basic profiling information, women tend to indicate significantly smaller household sizes⁹⁶, lower education levels (but slightly higher literacy rates) and different occupations⁹⁷. Furthermore, the sourcing of inputs, membership of poultry organization and security issues are experienced significantly differently by the women interviewed during the rolling baseline as the men during the baseline. These differences will be discussed below, in their respective areas (see detailed analysis in Annex 1).

For the main part, however, the rolling baseline and baseline datasets are similar. Therefore, the remainder of the analysis will focus on a direct comparison of midline 1 responses with baseline findings (see Annexe 2). This can be done in two ways: by comparing overall averages of the baseline and midline 1, or by comparing the answers of only those individuals who were interviewed both during the baseline and the midline 1 only. This write-up will focus on the latter, since a direct comparison of individuals’ responses during midline 1 and the baseline provides a better indication of developments over time.

CARD-F intervention has started for virtually all the beneficiaries

At the time of the midline 1 evaluation, the CARD-F intervention had started for 96% of Kandahar beneficiaries and 100% of Herat beneficiaries. The same findings are observed for the construction of the cots, which shows similar results to the baseline: slightly more cots were constructed in Herat than in Kandahar. Households in Herat reported to have received slightly more chickens, though this variation could be due to illiteracy. In contrast to the baseline findings, a higher level of investment was reported in Herat than in Kandahar. This is significantly higher than what respondents reported at the baseline (see detailed analysis under section “CARD-F intervention status” in Annexe 2).

The programme successfully targets the poor of the society

Assessing beneficiaries’ income is challenging. However, based on a number of indirect questions, it becomes evident that this project successfully targets the poor. Looking at their reported income, 21% of the Kandahar and 11% of the Herat beneficiaries reported no income whatsoever. Furthermore, the average monthly income per head is 4878 AFN (73 USD) and 4529 AFN (68 USD) in Kandahar and Herat respectively.

At DFID’s request, the evaluation team asked beneficiaries questions about their ownership of durable goods. Although this is not sufficient to provide definitive assessment of if beneficiaries sit above or below the poverty line, this can give further indication of poverty. Although most beneficiaries did own a mobile phone (97.3%) and an iron (58.3%), the majority of beneficiaries did not own more expensive durable goods like a bicycle (57.1%), a refrigerator (69.5%) or a stove (65.6%) which confirms the poverty of the households overall.

Overall, more than 90% of the respondents indicated they were very satisfied/satisfied with the programme, and the main reason for being satisfied was due to the additional revenue they received from it (see detailed analysis under sections “Financial circumstances” and “Poverty indicators” in Annexe 2).

⁹⁵ Note that during the baseline survey, the security situation was such that female enumerators could not be sent into the field. Therefore, male enumerators had to interview the husbands of female beneficiaries.

⁹⁶ Men are more likely to include extended family members while women tend to count only their direct family members

⁹⁷ The majority (66%) of Kandahar men interviewed at the baseline were farmers, while the women interviewed during the rolling baseline were predominantly homemakers (86%)

Herat beneficiaries appear more affluent than Kandahar beneficiaries

When comparing Herat and Kandahar on the basis of the indicators above, it seems that Herat beneficiaries are slightly more affluent than those in Kandahar. While the income levels are still somewhat ambiguous, Herat beneficiaries seem to own significantly more durable goods than those in Kandahar. For example, they own more TVs (80.7% versus 10.6%%), refrigerators (44% versus 13.4%), irons (69% versus 44.8%) and stoves (36% versus 31.3%)⁹⁸(see detailed analysis under section “Poverty indicators” in Annexe 2).

The human capital measurements show a similar story, since Herat has higher literacy rates⁹⁹ and higher education levels¹⁰⁰. During the midline survey, Kandahar respondents reported lower average household sizes than Herat, while this was the reverse in the baseline survey. As indicated above, this can be explained by the change in interviewee gender. In any case, the relationship between household size and poverty is ambiguous¹⁰¹(see detailed analysis under section” Basic information” in Annexe 2).

Finally, respondents in Kandahar (40 years on average) are older than in Herat (32)¹⁰². While a higher age might benefit the intervention as older women could have higher standing in the household and are less likely to be caring for infants, it could also be that older women have more children to care for, making them less available. The evaluation team will continue to examine any correlations between the age of the beneficiary and the success of the CARD-F intervention (see “Basic information” in Annexe 2).

Overall, midline 1 confirms the baseline findings that the Kandahar beneficiary households come from lower average starting point than those in Herat.

There are no clear differences yet in the financial sustainability of the beneficiaries over time

On one hand, respondents in both Kandahar and Herat reported an increase in their financial ability to recover the loss of their entire flock in the case of a disease or adverse weather¹⁰³. On the other hand, households from both villages also reported a decrease in their financial ability to repair damages to their cot in case it became severely damaged¹⁰⁴. The evaluation will likely need to wait to conduct a post-mortem analysis to determine if beneficiaries were correctly selected in this regard (see section “Financial circumstances” under Annexe 2).

Respondents rely more on other farmers regarding information on input prices

Both in Herat (+24%) and Kandahar (+30%), respondents have indicated a significant increase in obtaining information from other farmers. In Herat, this appears to have come at the expense of getting information from family / community members (-39%). This is surprising, given that female beneficiaries were directly surveyed at midline 1. The evaluation team will look into this result further in midline 2, to probe if these “other farmers” are female farmers (particularly if they were connected through CARD-F women-only associations) or beneficiary family members.

In Kandahar, besides the increase in relying on other farmers, respondents also indicate an increase in family / community members (+51%) and a very large decrease (+ 70%) in getting price information directly at the market. These results are likely attributed to the gender difference between the baseline and midline 1 (see detailed analysis in section “Poultry inputs, bottlenecks and organisations” in annexe 2).

⁹⁸ On the other hand, Kandahar beneficiaries own significantly more radio/tape recorders (37% vs. 19%) and sewing machines (52% vs. 37%)

⁹⁹ In the midline survey, 7.1% of the respondents indicated at least functional literacy in Kandahar, versus 17.9 % in Herat

¹⁰⁰ In the midline survey, 21 % of the Herat respondents had at least finished primary school, while 15 % had even finished high school. In Kandahar, only 7.5 % of the respondents had finished at least primary school.

¹⁰¹ As described by Lanjouw and Ravallion (1995), although conventional wisdom describes a negative relationship between household size and consumption (or income) per person, the consumption of certain goods (e.g. water taps, cooking utensils, firewood, clothing and housing) allow possibilities of sharing, reducing the cost per person.

¹⁰² At the baseline, male Kandahar respondents indicated an average age of 41. At the rolling baseline, female Kandahar respondents indicated an average age of 39.

¹⁰³ These results are significant in Kandahar but not in Herat.

¹⁰⁴ These results were significant in Herat, but not in Kandahar.

Beneficiaries rely significantly more on Afghan producers and other farmers for their inputs

The largest differences can be observed in Herat, where beneficiaries are relying significantly more on Afghan producers and other farmers for their inputs, at the expense of home-made, NGOs and provincial market products. There is even some evidence of import substitution in Herat in the procurement of equipment, since the reliance on importers dropped by 17% while the reliance on Afghan producers increased by 21% and “other farmers” by 17%. However, both regions rely more on imports than during the baseline, particularly in the procurement of day-old chicks. Therefore, the border closures with Iran and Pakistan do not seem to have significantly affect small-scale beneficiaries’ ability to source imported supplies. This could be due to the relatively smaller volume of inputs required by SSLs.

By analysing the differences in the Kandahar rolling baseline and the baseline findings, it becomes evident that women tend to rely more on home-made inputs rather than sourcing them from provincial markets. This is in line with the finding that respondents reported lower sense of security when traveling to markets. This does not necessarily mean that security is worse, but could be due to the change in interviewee status (see detailed analysis in section “Poultry inputs, bottlenecks and organisations” in Annexe 2).

Herat beneficiaries are increasingly members of poultry organizations, Kandahar beneficiaries less so

As detailed in section “Poultry inputs, bottlenecks and organisations” in Annexe 2, membership of poultry organisations have increased significantly in Herat: from 12% during the baseline to 81% during the midline. This could be due to the decreased costs in membership, as Herat households indicated a decrease in poultry membership fees from an average of 564 AFN (8.42 USD) to 126 AFN (1.91 USD) per year. More likely, however, this is due to the recent opening of a women-only CARD-F poultry associations in Herat. If confirmed at midline 2, the CARD-F should examine rolling out this initiative more widely across activities which target women.

In Kandahar, the data reports a significant drop in poultry membership between the baseline (49%) and the rolling baseline (2%) and midline (4.2%). This drop can most likely be explained by the fact that the midline interviewed women directly, rather than their husbands. In Kandahar, men tend to be the member of the poultry association and women rely on them to carry out business activities. Furthermore, while a women-only poultry organisation opened in Herat, this did not happen in Kandahar.

At the same time, membership of other agricultural organisations remains low (<5%) in both regions. The main reason for this is that there is still no such organisations in the area.

Improved rating of poultry organization services

In terms of the services provided by poultry organisations, Herat households indicated an increase in areas such as access to machinery and equipment, achieving better selling prices, access to storage facilities and access to technical assistance. On the downside, access to credit and cheaper inputs has decreased since the baseline. In Kandahar, the midline 1 shows increased ratings of the organisations’ services regarding access to credit and improved inputs. Once again, despite (or perhaps due to) the significant reduction in poultry organisation membership, respondents indicated improvements in the organisation’s offering of assistance in access to credit and improved inputs (see detailed analysis in section “Poultry inputs, bottlenecks and organisations” in Annexe 2).

Training sessions appear to work

Herat beneficiaries attended significantly more CARD-F training sessions than Kandahar beneficiaries. As a result, Herat beneficiaries noted improved poultry knowledge and practices, while Kandahar beneficiaries’ felt their ability had decreased.

Herat respondents attended on average 4.3 CARD-F training sessions since the beginning of the project. These training sessions were considered useful, since 80% of the respondents indicated they gained experience from them. Furthermore, Herat respondents indicated a significant increase in their ability to hatch chickens, administer medication, fix hutches and care for pullets/chickens.

Kandahar respondents attended significantly fewer CARD-F training sessions (only 0.25 on average) and reported overall drops in their overall knowledge of various poultry practices. As a result, while the baseline findings indicated that Kandahar respondents reported slightly higher poultry practices and knowledge than Herat, this trend has reversed in the midline.

These results could be linked to the fact that while only one poultry organisation has opened up in Herat, none have opened in Kandahar yet. However, the Herat association is not able to provide training sessions at its own premises. Therefore, the lack of training attendance by the Kandahar beneficiaries during the midline as well as the drop since the baseline are more likely explained by the overall position of women in Kandahar society, who face difficulties in joining poultry associations and attending their training sessions.

Nonetheless, given the positive results of the poultry practices in Herat combined with the increased training attendance, opening up poultry organisations that could allow for women-only beneficiary training in Kandahar could yield significant results (see detailed analysis in section “Beneficiary experience and knowledge with poultry” under Annexe 2).

Hopeful developments in the security situation

The panel data analysis revealed that both in Herat and Kandahar, respondents indicated a significant improvement in the extent to which their commercial relationships are affected by conflict¹⁰⁵.

Additionally, panel analysis showed that respondents in Kandahar indicated that the security situation is significantly less of an impediment to production now than it was during the baseline while there were no significant differences over time in Herat. Paradoxically, however, they also indicated that they feel less secure traveling to markets.

As with the other findings in this report that compare the Kandahar baseline with its midline, there is a strong gender element to these numbers. Although the positive findings could be a true reflection of improvements in the security situation, it might also be that women experience the situation very different from men. For example, women are less likely to regularly leave their compound in Kandahar, and rely on men for commercial relationships. Therefore, women might not be fully informed on the security situation.

As additional measures of market uncertainty caused by conflict, the acceptance of bank transfers¹⁰⁶ (7.1% of the respondents) and delayed payment (20.1%) is still low, while most respondents (94%) demand immediate payment. While these practices have not changed much in Kandahar, despite the change in interviewees, the panel analysis shows that Herat beneficiaries have become slightly more apprehensive since they accept less bank transfer (3.6 percentage points) and delayed payment (8.4%) and increased demand for immediate payment (+11%). Those differences, however, are not statistically significant (see detailed analysis in section “Conflict” under Annexe 2) and in Section 5.0 Conflict of this report..

¹⁰⁵In Herat, 27% of the respondents indicated that conflict affected their commercial relationships during the baseline. Out of those same interviewees, only 1.2% indicated that this was still the case during the midline. In Kandahar, the percentage dropped significantly from 67% to 5.7%

¹⁰⁶ Also note that as the payment amounts are likely to be quite small, bank transfers may be impractical for most SSL transactions.

5.0 Greenhouse value-chain midline 1 findings

5.1 Greenhouse sector assessment

5.1.1 Recommendations

The midline 1 surveys highlighted the importance of price volatility and maintenance costs. Therefore, financial viability of beneficiaries needs to be monitored closely by CARD-F.

Several coordination actions could be taken to strengthen beneficiaries' abilities to address cash flow problems due to price volatility and maintenance issues. Currently, provincial beneficiary associations only offer a limited range of service and coordination to grantees, such as providing access to quality inputs and providing beneficiaries with networking activities. However, associations are well placed to organise services to address new bottlenecks that arise, including after the CARD-F's programme is complete. The evaluation recommends CARD-F associations to do the following:

- **Design a system of risk sharing grants** as well as provisions of loans and credit (currently only offered by the Kandahar association at the midline);
- Go beyond the single sourcing of products and **purchase inputs jointly** through the associations at better prices;
- **Create a capacity building project for associations and beneficiaries**, to enable them to design risk assessment and management processes.

At the time of the midline, association are merely a place to meet and share problems besides sourcing quality inputs. However, there is the opportunity to actively engage associations and their members in problem solving. The long-term objective would be to progressively enable associations to design with beneficiaries their own risk assessment process. Such a system involving all actors would build trust between grantees and associations, as well as enable them to identify and resolve bottlenecks autonomously through provincially tailored processes. This could significantly contribute to the sustainability of businesses after the end of CARD-F's intervention.

5.1.2 Market Characteristics

4.1.2.1 Main figures of the horticulture sector

Afghan horticulture production represents 92 billion AFN annually (1.3 billion USD), or 6.7% of Afghan GDP¹⁰⁷. There is also a considerable volume of imports, an estimated 6.7 billion AFN (98 million USD) annually, stemming in part from the seasonal nature of production.¹⁰⁸ This seasonality in turn provides opportunities for Afghan export markets, totalling 30.5 billion AFN (450 million USD) annually¹⁰⁹¹¹⁰. The Afghan export market is for the most part limited to nearby countries due to limitations in terms of packaging and refrigerated storage and shipping that result in a short shelf life, as well as demanding quality testing standards that Afghanistan cannot meet.

Grain production is far more common among Afghan producers but largely for subsistence cultivation, while horticulture production is widely commercialized. As many horticulture products' harvests are labour-intensive, a significant number of short-term jobs are produced, estimated at 200,000 FTE jobs in 2014.¹¹¹

¹⁰⁷ Horticulture Sector Review, Altai Consulting for the World Bank 2014

¹⁰⁸ Ibid.

¹⁰⁹ The largest exports in volume being onions (31,000 mt) to India and Pakistan, grapes (24,000 mt) to Pakistan, and raisins (21,000 mt) to Pakistan, Russia and India..

¹¹⁰ Note that Afghan exports, particularly to Pakistan, are commonly re-exported and sold as the produce of the intermediary country. However, the full extent of this practice is difficult to trace.

¹¹¹ Ibid.

Imported vegetable products represent 12.8% of Afghanistan's overall trade balance¹¹², with an estimated 95% of this being off-season crops¹¹³.

Target Crop Production

Greenhouse can be used to produce a wide range of products, and within the CARD-F programme these include ornamental plants, bitter melon, grapes, oranges and lemons. However, CARD-F advises beneficiaries to focus on the production of tomatoes and cucumbers, and at midline 1 these products were grown by 85.2% of beneficiaries (against 91% at the time of the baseline surveys)¹¹⁴. Given the strong focus on this production, sections below deal with the production of tomatoes and cucumbers in order to provide a clear context for comparisons of beneficiary production.

4.1.2.2 Targeted crops

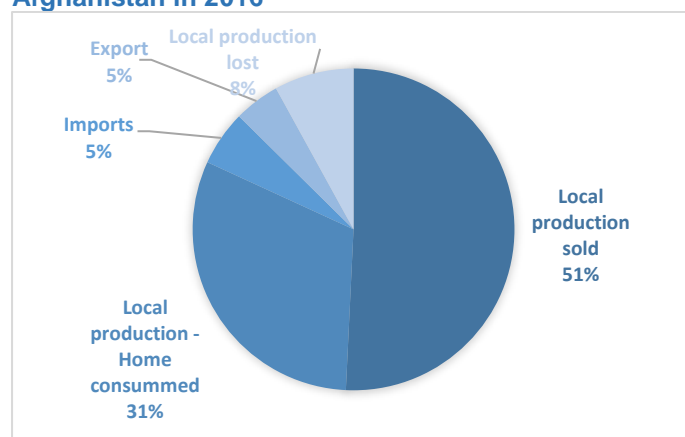
Tomato production is more widespread than cucumber. Production of this crop is significant in volume and shows the potential for a positive trade balance. Meanwhile, cucumber production remains more limited, producing barely enough volume to meet domestic demand. Consumption of both types of produce is well-established in the Afghan population, including during the off-season, with a strong potential for domestic producers to replace imports.

Tomato market overview

Tomatoes are commonly consumed throughout Afghanistan. While a large commercial production exists, tomatoes are also commonly produced in kitchen gardens for home consumption, making total production and consumption difficult to assess precisely. In 2014, national production capacities were estimated at 1.1 million tonnes, thus covering the need of the Afghan population¹¹⁵.

Based on the midline 1 consumer survey the annual consumption represents around 1 million mt per year, a number that confirms production figures. 51% of this annual consumption is local production traded and sold in the country (593,848 mt), 31% is home consumption (363,739 mt). An additional 5.8% are imports (64,797 mt), mostly consumed during the off-season¹¹⁶. Of the remaining annual production, only 4.8% (53,700 mt) is exported¹¹⁷. A small quantity (around 8% or 93,700 mt from the consumer survey) is probably lost stock or used as livestock feed (see Table 24 below)¹¹⁸.

Figure 13: Pie chart displaying the breakdown of consumption and exports of tomatoes in Afghanistan in 2016



¹¹² <http://atlas.media.mit.edu/en/profile/country/afg/#Imports>

¹¹³ Given this, improving the ability of Afghan producers to meet off-season needs through either greenhouse production and/or improved cold storage facilities, has the potential to create economic impact.

¹¹⁴ A difference that can be considered as marginal given the smaller size of the sample for the midline fieldwork (25% vs 100% at the baseline) and its timing at the tail of winter season.

¹¹⁵ Altai Consulting (2013), Agriculture Data Collection and Utilisation System (ADCUS) programme.

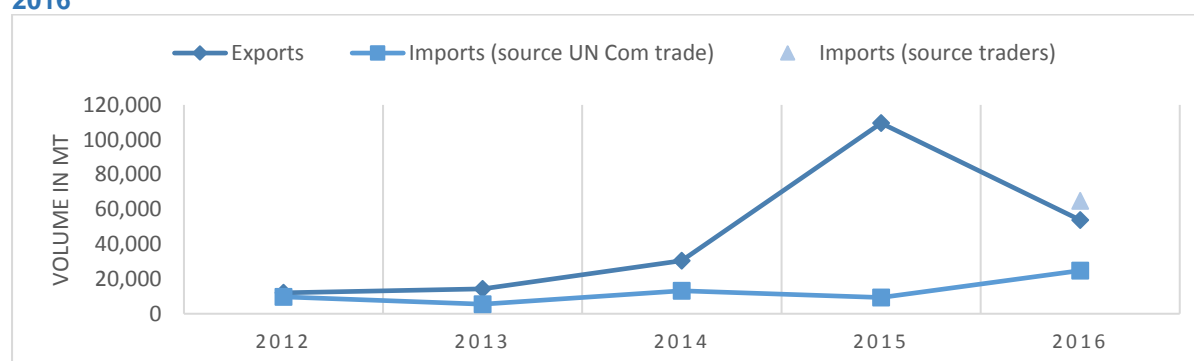
¹¹⁶ 97% of imports are indicated as sold off-season by traders.

¹¹⁷ Altai Consulting estimates based on consumer and fieldwork surveys.

¹¹⁸ The director of CARD-F's Greenhouse associations in Kabul declared that a significant part of the production has been used to feed animals once the open land production had flooded the market.

Over the last five years, exports have been multiplied by four and the vast majority of exports are directed or transit through Pakistan¹¹⁹. However the likelihood of a stable, growing level of exports in the coming years is limited. As illustrated in figure 1, annual exports decreased in 2016 from 109,511 mt to 53,795 mt which confirm traders statements that short but frequent cross-border issues over the year have resulted in frequent loss of produce before crossing the border. Meanwhile, tomato imports have seen a relatively slow growth compared to exports, thus allowing Afghanistan to benefit from a positive (according to UN Comtrade data) or close to positive (according to traders' statements) tomato trade balance¹²⁰.

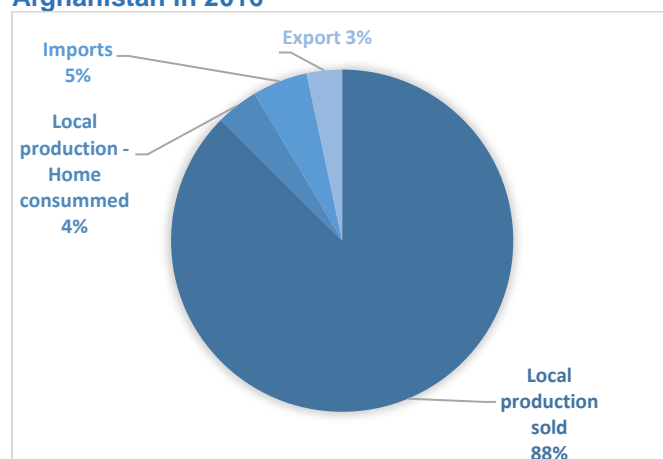
Figure 14: Chart illustrating the evolution of exports and imports of tomatoes from 2012 to 2016



Cucumber market overview

Like tomatoes, cucumbers are a commonly-consumed product throughout Afghanistan, and one where domestic production meets a significant portion of the country's need with 315,300 mt of cucumber grown in 2016, representing 95% of cucumber consumed in-country. Since 2013, capacities have increased by approximatively 14% with Afghan production estimated at 275,000 mt in 2013 (see Table 26 below)¹²¹.

Figure 15: Pie chart displaying the breakdown of consumption and exports of cucumbers in Afghanistan in 2016



The commercial balance for cucumbers seems positive for Afghanistan. Afghan exports to other countries have increased over the past two years, from 52 mt in 2012 to 11,131 mt in 2016 as shown in Figure 2 below. Meanwhile, reported imports have remained significantly low with only 75 mt in 2015 and none in 2016. Given the large consumption of Afghan households and the surprisingly low amount of imported produce, it seems likely that imports are under-reported. Based on KIIs with provincial and

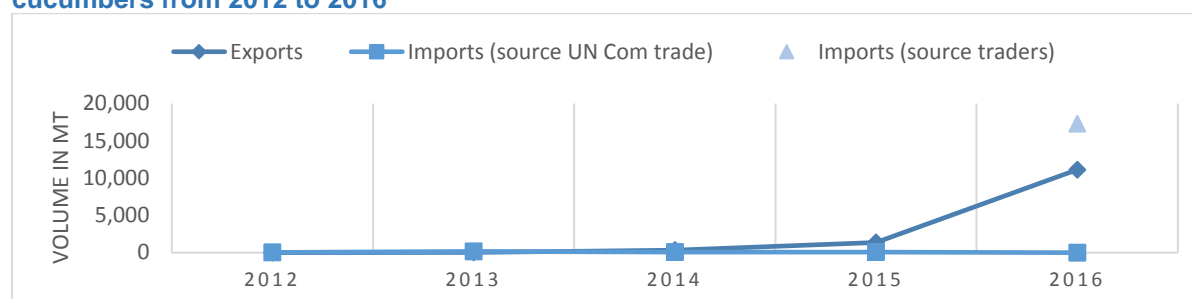
¹¹⁹ 100% of imports transit to Pakistan according to UN Comtrade statistics.

¹²⁰ Imports are about 24,000 mt according to UN Comtrade statistics. However, traders interviews throughout the country indicates that imports volume is higher than official data in 2016, with approximatively 64,797 mt imported throughout the year. This difference can be partially explained by non-declared produced entering the country.

¹²¹ Altai Consulting (2013), Agriculture Data Collection and Utilisation System (ADCUS) programme. Revised estimates since the baseline report.

international traders and their own traded volumes, imports in Afghanistan should sit at around 17,000 mt annually, 5,800 mt above domestic exports.

Figure 16: Chart illustrating the evolution of local production exports and imports of cucumbers from 2012 to 2016



Tomatoes and cucumbers: demand and consumption

Household consumption of tomatoes represents a significant market with an estimated annual value of 14.2 billion AFN (208 million USD) at the time of the midline survey. Household consumption of cucumbers represents a smaller market than tomatoes both in terms of volume and value, with an estimated annual 7.2 billion AFN (105 million USD) at midline 1. For both produce types, demand is characterized by common patterns and habits throughout the country, with opportunities for off-season domestic production.

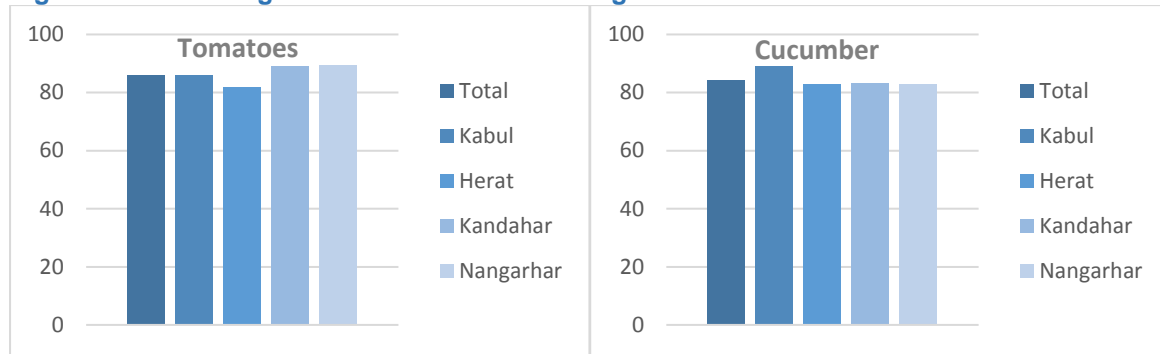
Nationwide consumption level and habits

Tomatoes and cucumbers are a daily consumer goods for most of the Afghan population. 98.5% of consumers interviewed for the midline stated that they purchase tomatoes and cucumbers¹²². 90% of respondents buy tomatoes at least once a week, with 41% purchasing them daily. Consumption for cucumbers is lower, with 84% of respondents stating they consume cucumber at least once a week, and only 31% eating them daily.

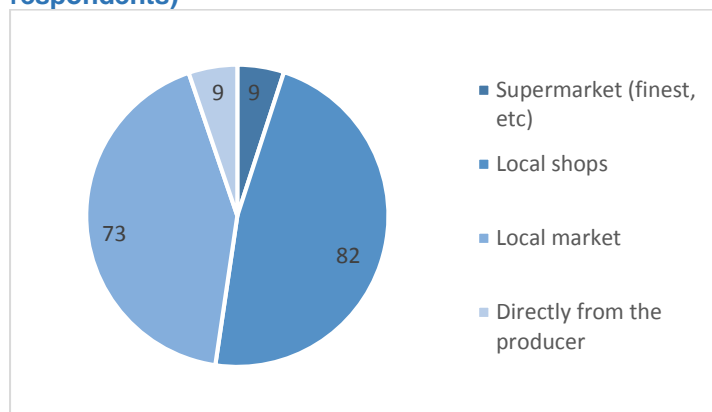
Provincial off-season consumption and habits

Table 26 below presents Tomatoes and Cucumber consumption among provinces. At the provincial level, the average tomato consumption sits around 0.5 kg per person per week across provinces. Between 80% and 90% of consumers continue buying tomatoes during winter, though this varies by province. Cucumber consumption is lower, with an average of 0.3 kg being consumed per week. However, most respondents in targeted provinces consume cucumbers off-season (84% of respondents) and purchase through the same distribution channels. This level of produce consumption confirms the opportunity for domestic protected horticulture to partially replace the imports which constitute the majority of products sold off-season.

¹²² 90% of respondents buy tomatoes and 54% buy cucumber at least once a week. 41% purchasing tomatoes daily and 31% purchase cucumber daily. Kandahar displays particularly high consumption of tomatoes with 50% of respondents stating that they consume tomatoes every day.

Figure 17: Percentage of households consuming tomatoes and cucumbers off-season

Distribution channels remain similar across the produce types, provinces and between season and off-season (see table 27 below). Only 5% of households off season and 10% during the season buy tomatoes directly from producers. Purchases remain concentrated in local shops and markets. However, these results might include some bias due to the methodology of the surveys, conducted through phone interviews. With mobile phone owners living mostly in urban areas, results might underestimate the level of farm-gate purchase in rural areas and thus the opportunity for CARD-F beneficiaries to improve their margin by selling close to where they produce.

Figure 18: Purchase location for tomatoes and cucumbers (in percentage amongst the respondents)

Key purchasing drivers

Most purchasing drivers are quality (58% of respondents mentioned it), price (15%) and origin (2%). However, these answers might be misleading and may under-report the influence of price and origin in purchasing choices, which would benefit off-season domestic production. Indeed, when probing deeper, 97% of respondents answered they find tomato prices too expensive and 95% stated that they would buy more tomatoes if prices were to decrease. Additionally, 81% specified that they believe local produce is of better quality than imports.

CARD-F progress and macroeconomic impact

In this context, CARD-F has taken a significant place in the off-season production subsector, achieving most of its infrastructure objectives. CARD-F supported enterprises are starting to represent a sizeable amount of off-season production in Nangarhar.

Advance of the programme

Table 27 below presents the number of greenhouses and beneficiaries at the baseline and midline 1. According to most recent data provided by CARD-F, there were 477 CARD-F supported greenhouses: 70 in Kabul, 77 in Kandahar, 240 in Nangarhar, 30 in Parwan and approximately the same number in

Takhar and Khost¹²³. Between baseline and midline 1, the programme achieved the construction of 36 new greenhouses in the focus provinces—15 in Kabul and 17 in Kandahar. CARD-F greenhouses in the three studied provinces total 214,000 sqm (21.4 ha) of cultivatable land against 18 000 sqm (18 ha) at the baseline.

Table 13: Programme progress between baseline and midline 1 fieldwork

Province	Baseline			Midline 1		
	Number of greenhouses	Total surface (sqm)	Number of beneficiaries	Number of greenhouses	Total surface (sqm)	Number of beneficiaries
Kabul	55	22,000	15	70	28,000	18
Kandahar	56	70,400	43	77	90,000	58
Nangarhar	240	96,000	113	-	-	-

Since the baseline, investment in greenhouse construction in Kabul represents 435,000 USD (6,492 AFN) of which 56% was invested by beneficiaries and 4% by CARD-F. These activities mobilised construction workers for a total of 3,150 man-days. Kandahar province has benefited from larger investments and higher contributions from the programme. Construction since the baseline represents 1.5 million USD (22,400 AFN) of which 36% was invested by beneficiaries and 64% by CARD-F. These activities mobilized construction workers for a total of 4,410 man-days.

In addition to this, across Afghanistan there were an estimated 1,000 greenhouses supported by other programmes¹²⁴, with indication that this number is consistently increasing. CARD-F and MAIL provincial offices counted 200 new greenhouses privately funded in Kabul and 50 under construction between the baseline and midline fieldworks. Numbers are lower in the two other provinces: 40 privately funded greenhouses in Kandahar and around 20 in Nangarhar. Finally, a growing number of households have started protected horticulture production for home consumption. However, as is the case with CARD-F greenhouses, they are not typically used for fully off-season production, but rather for extending the growing season¹²⁵.

In total, commercial greenhouses represented a maximum production area of 34 ha at the time of the baseline surveys, only a small fraction of overall production annually. The total surface remains small in comparison with open land production (6 million hectares)¹²⁶. At midline 1, the production area of protected horticulture including non-CARD-F greenhouses, rose from 340 000 square meter (sqm) (34 Hectares (ha)) to 650 000 sqm (65 ha) in 8 months, which represents an 47% increase in less than a year. Noting that there is potential for a greater number of production periods during the year, this means that greenhouses production capacities are actually larger with one hectare of protected horticulture, potentially producing the equivalent of up to 5 ha of open field¹²⁷.

Annual CARD-F's production volume and value

Despite the small amount of land dedicated to protected horticulture, CARD-F producers represent a significant part of the off-season market share for tomatoes and cucumber. In Kabul and in Kandahar, most producer have recently started their production and have less experience. Nangarhar however, illustrates the potential success of the programme. Harvests of tomatoes and cucumbers in a year respectively represents 27% and 11% of the volume traded off-season by traders. These traded volumes are handled by large traders dealing in the provincial centre and do not account for the total volumes traded in the province. They however indicate that CARD-F's production during the extended season is not marginal in volume nor in value (see Tables 29-30 below).

¹²³ Updated July 2017. CARD-F M&E data.

¹²⁴ USAID Regional Agricultural Development Programme, USAID Afghanistan Agricultural Extension Programme II, World Bank National Horticulture and Livestock Programme, as well as various smaller programmes.

¹²⁵ Tomato harvests will start in June, May or even April in some cases, instead of July for open-field cultivation, extending the season by two months.

¹²⁶ MAIL

¹²⁷ Based on the yield difference between open land production and greenhouse production of tomatoes in Nangarhar

Table 14: Market share of CARD-F's tomato production

Province	CARD-F's Beneficiary production (mt)	Total provincial production (mt)	% of local production	% of off-season traded volume ¹²⁸	Value (AFN/USD)
Kabul	4	33,710	0.01%	0.01%	331,000/4,900
Kandahar	29	33,104	0.09%	0.47%	93,200/1,300
Nangarhar	592	129,130	0.46%	27%	699,000/10,300
Total	625	1,105,094	0.05%	0.98%	

Table 15: Market share of CARD-F's cucumber production

Province	CARD-F's Beneficiary production (mt)	Total provincial production (mt)	% of local production	% of off-season traded volume ¹²⁹	Value (AFN/USD)
Kabul	63	2,285	2.71%	0.57%	5,950/100
Kandahar	22	22,674	0.10%	0.83%	-
Nangarhar	143	3,687	3.73%	11.8%	1.24 million/18,000
Total	229	275,000	0.08%	1.36%	1.25 million/18,100

CARD-F's impact on employment

Amongst households managing greenhouses, the programme seems to have a positive impact on employment. Since the baseline, the management of greenhouses generated an average of 0.68 additional FTE and 0.55 person employed part-time outside of family work. Additionally, a third of interviewees are employing one additional worker part-time. Since the introduction of greenhouses, interviewed farms have seen an average increase of 0.68 people employed. This represent a total of 77 FTE: 7 in Kabul, 19 in Kandahar and 51 in Nangarhar. Additionally, there are 40 part-time employees, 4 in Kabul, 10 in Kandahar, and 27 in Nangarhar.

Indirect jobs created due to CARD-F are however significantly lower in the protected horticulture sector than in the poultry sector. Indeed, quantities produced by beneficiaries represent a marginal part of the market and translate in very few jobs at the marketing level. Considering input traders, traders, transporters and retailers needed for the production and distribution of CARD-F's produce, the programme would only indirectly generate 14.8 FTE jobs¹³⁰, or one indirect job out of 5 direct jobs.

5.1.3 Value-chain assessment

At the macroeconomic level, the programme seems to have a significant impact, especially in Nangarhar where producers have had the time to gain experience over the past five years. However, present production remains limited in Kabul and Kandahar. Besides, bottlenecks that challenge the present greenhouse economic model have been identified at several steps of the value-chain.

4.1.3.1 Inputs

Supply chain structure

Tomato and cucumber cultivation begins with procurement of seed, fertilizer, and, to a limited degree, pesticides and other chemicals. Producers typically purchase directly from importers who maintain shops in major markets.

Seed importers buy most frequently from China, Pakistan and Iran¹³¹. Pakistani products have seen a small decline (45% of importers were trading products from this country at the baseline survey) while the share of Chinese inputs have increased (65% of importers trading Chinese products at the baseline survey).

¹²⁸ Based only on volumes traded by large traders in the studied provinces

¹²⁹ Based only on volumes traded by large traders in the studied provinces

¹³⁰ Without considering jobs created through the money generated by these activities which are redistributed in the economic system and thus implying a few extra indirect jobs.

¹³¹ 83% of imports from China, 33% from Pakistan and 33% from Iran.

There is a large number of input traders throughout Afghanistan, with an estimated 50-100 in every major provincial centre¹³². Importer/trader profit remained stable¹³³. On average, purchase costs amounted to 92% of the traders' price, fees and tariffs accounted for 0.1%, and labour and storage costs 0.5%. The principal weakness of the supply chain remains price variations, as observed at midline 1.

Price variations from baseline to midline 1

Since the baseline, seeds prices have shown an increase of 38% in the market and of 46% for CARD-F beneficiaries. This can partially be explained by the different timeframe chosen for the baseline and midline surveys. As most farmers were purchasing seeds in March, price increase might be partially demand based. However, cross-border issues might have exacerbated the price increase¹³⁴.

Unlike seeds, sourcing channels for fertilizer and pesticides are more diversified. Only 50% of the declared traded volume is entering the country through Pakistan. Additionally, many farmers use homemade fertilizer. In this context, fertilizer prices actually decreased while pesticide prices remained stable. Only seeds, which are the most significant input costs for CARD-F's beneficiaries, saw unusual price increases due to cross-border issues (see Table 31 below).

Table 16: Input prices comparison between market prices and beneficiary declaration at both baseline and midline.

Input	Market prices			Beneficiary costs ¹³⁵		
	Baseline price (AFN/kg)	Midline 1 price (AFN/kg)	% variation	Total yearly cost at the baseline	Total yearly cost at the midline	% variation
Imported improved Seeds	12,300	17,000	+38%	12,698	18,620	+46%
Solid Fertilizer	490	400	-19%	11,878	8,679	-26%
Pesticides	1,700	1,700	0%	3,700	4,100	+10%

Maintenance costs specific to greenhouse

Outside required production inputs, maintenance costs of greenhouse represent an extra cost that beneficiaries need to take into account¹³⁶.

Besides ordinary maintenance costs, it seems that CARD-F's greenhouse design was not suitable for difficult weather conditions. As Kabul province had to face heavy snow falls this winter, 31 greenhouses were damaged and required important repairs which were only achieved in June, thus highly lowering the production capacity of the programme in the province¹³⁷. This cost of reparation has been shared between CARD-F and grantees, as many beneficiaries did not have the means to cover all costs themselves. Table 32 presents the costs incurred by the grantee and CARD-F to repair the damaged Greenhouses, by village amongst the Paghman district (close to Kabul)

¹³² However, some companies control a significant part of the market. In Kandahar, around 4 large traders (who are also present in other provinces) control 90% of the market. Nevertheless, this concentration around a few companies does not imply substantial margins, with an average margin of 10% according to interviewed actors

¹³³ A typical margin of 950 AFN (13.9 USD) per kg of seed against 1,050 AFN (15.4 USD) at the time of baseline, and 48 AFN (0.7 USD) per kg of fertilizer

¹³⁴ Indeed, from 70% to 90% of seeds are from Pakistan, or entering the country through Pakistan, which border was closed at the time of the survey.

¹³⁵ Collected % variations are consistent with CARD-F's M&E Data

¹³⁶ At the baseline, before CARD-F's intervention, maintenance costs for their entire farming operations was estimated at an average of 4,250 AFN (62.5 USD). There was an important relative increase in maintenance costs at midline 1, which rose at an average of 5,700 AFN (83.8 USD)—an increase of 34%.

¹³⁷ The average cost of repairs was 38,525 AFN (575 USD).

Table 17: Costs sharing of Greenhouse's reconstruction

District	Village	No. of Greenhouses re-installed	CARD-F Contribution (50%)	Grantee Contribution (50%)
Paghman	Oriakhil	1	\$287.50	\$287.50
Paghman	Qala e Agha	2	\$575.00	\$575.00
Paghman	Qala e Agha	2	\$575.00	\$575.00
Paghman	Qala e Agha	7	\$2,012.50	\$2,012.50
Paghman	Oriakil	9	\$2,587.50	\$2,587.50
Paghman	Qalai Naw	2	\$575.00	\$575.00
Paghman	Chonghar	8	\$2,300.00	\$2,300.00
Total		31	\$8,912	\$8,912

4.1.3.2 Production

Tomatoes

Tomato seedlings start in February, and are ready for transplant to open fields when frost is no longer a risk. In tomato-producing areas such as Nangarhar and Kandahar, this usually takes place in April, depending on the farm. Harvest begins late in June, with plants productive for 90 to 120 days. Over the course of this period, a typical plant will produce 1.5 kg of tomatoes, for a total of 12 mt per hectare.

The percentage of greenhouse farmers growing tomatoes remained stable from the baseline to the midline 1 survey¹³⁸. It is the second more widely grown crop, after cucumbers. However, most surveyed producers were located in Nangarhar with only two beneficiaries in Kabul and three beneficiaries in Kandahar growing tomatoes.

Most farmers do not grow tomatoes during the winter. CARD-F greenhouses do not usually have a system for temperature control, and their high ceilings make it difficult to heat at a warm enough temperature during the cold season¹³⁹. However, production of seedlings can begin early with greenhouses, as soon as February, compared to April with open field cultivation. This early planting potentially brings harvest forward to May, allowing greenhouse-cultivated tomatoes to reach markets prior to the start of the open field season.

Cucumber

Cucumbers are very sensitive to frost, but can be seeded any time from February to October in some provinces where ground temperature remains stable. A small part of overall production comes from seedlings grown earlier in plastic tunnels and greenhouses. They are then transplanted into open field after 14 to 20 days. The more common practice, however, is to directly seed cucumber in the ground. Contrary to best practices, cucumbers are planted in widely varying densities from 18,000 to 55,000 plants per hectare¹⁴⁰ which partially explains the yield difference across provinces (see Table 34 below).

The cultivation period for cucumbers is between 55 and 70 days, shorter than tomatoes. The amount of fertilizer used varies especially for cucumbers depending on the targeted yield¹⁴¹. It might be necessary to increase these quantities further to achieve the highest yields¹⁴². As with tomatoes, cucumbers require trellises (mostly made of bamboo). Water intake is similar to tomatoes¹⁴³.

Protected horticulture represents a very limited share of annual cucumber production, although this practice is more common than with tomatoes. 66%¹⁴⁴ of CARD-F's interviewed beneficiaries were growing cucumbers, for a total of 56 mt harvested between the baseline and midline 1.

¹³⁸ 38% of them growing this plant against 42% eight months ago, therefore confirming that farmers followed CARD-F's advice

¹³⁹ As declared when interviewed, some beneficiaries tend to believe the low temperature in their facilities would not extend the growing cycle for a profitable period

¹⁴⁰ CARD-F advice to farmers is to grow 25,000 plants per ha (hence 1000 plants per 400 sqm greenhouse).

¹⁴¹ Raising the yield of one harvest from 15 mt/ha to 30 mt/ha requires 36% more fertilizer than is needed for tomatoes

¹⁴² 100 MT/ha in open-field.

¹⁴³ 25 to 50 cm of water required over the growing cycle.

¹⁴⁴ The annual yield for tomatoes in CARD-F greenhouses is 41% higher than the average yield in open field. In Nangarhar, the average yield among CARD-F beneficiaries is eight times higher than the average for open land cultivation.

Yield comparison

As illustrated in the Table 33 below, CARD-F beneficiaries seem to grow tomatoes at higher yields and to also to improve their yield over time. In Kabul and Nangahar, CARD-F yield is more productive than open land cultivation for tomatoes. This significant increase is explained by a higher number of harvests throughout the season but also by better results for each single harvest. Whether this is a long-term evolution due to increasing technical capacities will have to be assessed in the coming surveys¹⁴⁵.

Overall, these higher yields result in a change at the macro level in Nangarhar only with CARD-F beneficiaries' production representing 27% of the volume traded by provincial traders off-season¹⁴⁶. Such an impact is not noticeable in Kabul and Kandahar however where there are fewer and more recently-established greenhouses.

Table 18: Yield comparison between open land and CARD-F greenhouses at baseline and midline surveys for tomato production.

Location	Open land, kg/ha/year ¹⁴⁷	CARD-F greenhouses Baseline, kg/ha/year	CARD-F greenhouses Midline 1, kg/ha/year
Domestic average	12,874	-	51,332
Kabul	18,765	-	26,500 ¹⁴⁸
Kandahar	12,035	-	-
Nangarhar	8,890	54,615	75,164

As shown in Table 34 below, at baseline, cucumber was already the primary crop in CARD-F greenhouses in Nangarhar province¹⁴⁹. Cucumber remains the most widespread crop grown among CARD-F beneficiaries¹⁵⁰. However, the average annual yield substantially decreased in all provinces. CARD-F farmers in Kabul and Nangarhar declared a yield just above the national average and under the average of their provinces¹⁵¹.

The main explanation for cucumber low yields is that, unlike tomato, where production is concentrated in the early season, 50% of cucumber harvests occur between October and December for CARD-F's beneficiaries. At that time, yields were 60% lower than summer harvests. Several producers experienced diseases that significantly reduced their production. Additionally, beneficiaries will often attempt to extend their materials' lifecycle to limit their maintenance costs, and therefore wait to replace their plastic covered ceiling.

Table 19: Yield comparison between open land and CARD-F greenhouses at baseline and midline surveys for cucumber production.

Location	Open land, kg/ha ¹⁵²	CARD-F Greenhouses Baseline, kg/ha	CARD-F Greenhouses Midline 1, kg/ha
Domestic average	15,981	49,800	23,478
Kabul	58,333	-	26,708
Kandahar	26,986	40,894	2,820
Nangarhar	50,667	58,707	20,247

4.1.3.3 Marketing

Similar to inputs, producers can rely on a diversified distribution channels. The main value-chain bottleneck at the marketing stage is price variations, rather than the structure of the market itself.

¹⁴⁵ Note that baseline tomato yield results are consistent with CARD-F M&E team data. However, there was no data to compare our midline results at the time of the redaction.

¹⁴⁶ Note however that part of the tomato production from CARD-F beneficiaries is actually in-season.

¹⁴⁷ Altai Consulting (2013), Purdue University/USDA Agriculture Data Collection and Utilisation System (ADCUS) programme.

¹⁴⁸ Note that only one beneficiary declared growing tomatoes at that time. This result can hardly be considered as an average for the province

¹⁴⁹ Representing 69% of the production in volume but only 45% of the production in selling value.

¹⁵⁰ All Kabul beneficiaries grow cucumber, while 72% of Kandahar beneficiaries and 41% of Nangarhar beneficiaries grow it.

¹⁵¹ 26 mt in Kabul and 20 mt in Nangarhar per hectare per year. The yield in Kandahar is surprisingly low with only 2.8 mt per hectare per year.

¹⁵² 340,148 mt of tomato production marketed annually based on previous surveys "Altai Consulting (2013), Purdue University/USDA Agriculture Data Collection and Utilisation System (ADCUS) programme".

Distribution channel

Producers have two primary routes to market: sale to a trader or sale directly to consumers. Sale to traders does not incur any additional costs, as traders will typically be responsible for transport and packaging.

At the time of the baseline survey, it was estimated that 31% of tomato domestic production was sent to market¹⁵³. Given consumption level out of the consumer surveys and traders figures, it can be safely inferred that the share of marketed tomatoes has increased since 2013. A third of the production goes to home consumption while the majority being sold (58%) and a small percentage lost. Domestic production traded by provincial traders (both nationally and internationally) only accounts for 10% of total production. Most products are either being sold in short marketing chains¹⁵⁴ or are used as in-kind payments. Sale direct to consumers can be more lucrative, but requires additional producer time and transport costs, as well as assumption of a greater risk of spoilage and unsold product. Usually, greenhouse owners will not favour this option, but will sell their harvests directly local wholesalers or retailers. Like tomatoes, most cucumbers are either being sold in these short marketing chains or are used as in-kind payments (68%). Only 24% of the domestic production transits through traders on the domestic market. The remaining 4% represents home consumption by producers.

Price variations

Tomatoes

Prices vary considerably in-season but no consistent variation can be observed across the country (see Table 35 below)¹⁵⁵.

Table 20: Selling price variations for tomatoes according to traders in the three studied provinces

Province	Unit	Minimum selling price	Average selling price	Maximum selling price
Kabul	AFN/kg	8	14	20
Kandahar	AFN/kg	18	24	29
Nangarhar	AFN/kg	16	26	42
Average	AFN/kg	14	21	30

Off-season tomato production is a small but profitable venture, especially in a context where the country is still dependant on imports from Pakistan. Given cross-border issues at the time of the midline survey, off-season prices increased significantly¹⁵⁶. Prices were even higher due to border closings according to consumers¹⁵⁷.

Off-season producers have to compete with a large volume of imports that still represent the majority of traded volumes in the winter when border are not closed. Of the overall tomato trade by large size provincial traders, 50% is sold off-season¹⁵⁸. Significant variation can be observed between provinces. While no traders declared trading domestic products in Kabul and in Kandahar, domestic tomatoes represent 18% of traded volumes off-season in Nangarhar, illustrating the impact of protected horticulture development in the province. The farm-gate price for CARD-F greenhouses is stable since

¹⁵³ Altai Consulting (2013), Purdue University/USDA Agriculture Data Collection and Utilisation System (ADCUS) programme.

¹⁵⁴ Directly to consumers or local retailers

¹⁵⁵ 1 kg of tomatoes is sold between 10 AFN (0.14 USD) and 20 AFN (0.29 USD) in-season and is on average 26% more expensive than 1 kg of cucumbers.

¹⁵⁶ . At the baseline survey, prices were rising around 25 AFN (0.36 USD) /kg to 27 AFN (0.44 USD)/kg off-season. The following winter, prices rose from 20 AFN (0.29 USD) to 33 AFN (0.48 USD) per kg, with peaks up to 50 AFN (0.73 USD). Source: Midline 1 fieldwork, interviews with traders and retailers in the three studied provinces.

¹⁵⁷ An average purchase price around 76 AFN (1.11 USD) and up to 82 AFN (1.20 USD) in Kabul. Source: Midline 1 fieldwork, consumer survey.

¹⁵⁸ All in all, this means approximately 15% of the consumption is occurring off-season. Of this, an estimated 97% is imported (98.5% at the baseline).

the baseline survey¹⁵⁹ and slightly higher than the retail price in-season¹⁶⁰ but significantly lower than off-season sale price on markets¹⁶¹.

Cucumber

Like tomatoes (see Table 35 above and Table 36 below), prices vary considerably in-season, but no consistent variation can be observed¹⁶². Likewise, consumers reported even higher prices at the time of the survey due to border closings¹⁶³. Nangarhar province seems to have been particularly affected by cross-border issues.

Table 21: Selling price variations for cucumbers according to traders in the three studied provinces

Province	Unit	Minimum selling price	Average selling price	Maximum selling price
Kabul	AFN/kg	15	22	30
Kandahar	AFN/kg	15	20	25
Nangarhar	AFN/kg	11	25	41
Average	AFN/kg	13	22	32

Domestic traded volumes off-season remain however, very low as none of the big traders in Kabul and Kandahar reported trading domestic cucumbers at this time of the year¹⁶⁴. However, selling prices reported by CARD-F's farmers remain below the expectations of the CARD-F economic model¹⁶⁵.

5.1.4 Conclusions

Beneficiaries display some optimistic results in terms of production volumes. If some yields have been unexpectedly lower for cucumbers over the past 8 months, notably due to diseases, tomato results confirm that producers are able to produce at higher yield than the average national open field cultivation and on an extended period of time.

Outside of production itself, CARD-F's greenhouses grantees can rely on a more diversified network of actors' suppliers and distributors than what was observed in the poultry sectors. However, they remain vulnerable to price volatility at both ends of the value-chain, when purchasing inputs and selling their products. Besides, midline results confirm the baseline situation where producers are still unable to sale their produce at prices defined to the economic model initially design.

If the gross revenue significantly increased due to better yields and an increase of the selling price in Nangarhar as illustrated in Table 37 below, the gross margin however did not increase as much due to the increase of costs. It represents 44% of the gross profit against 59% at the baseline (-24%).¹⁶⁶

¹⁵⁹ 15 AFN (USD 0.22) at baseline and around 16 AFN (0.23 USD) /kg at midline 1.

¹⁶⁰ 15 AFN – 0.22 USD.

¹⁶¹ 33 AFN – 0.48 USD.

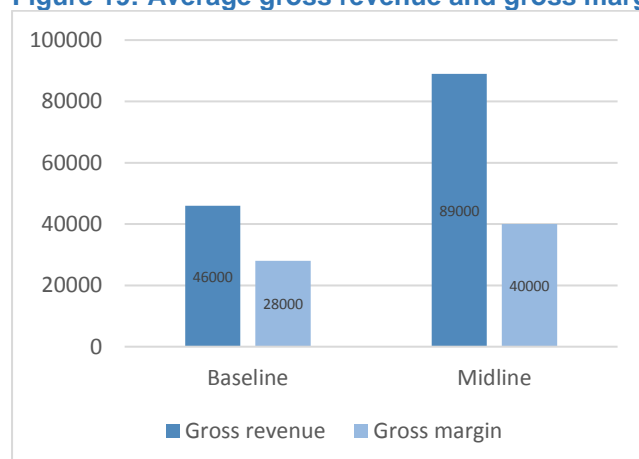
¹⁶² 1 kg of cucumber is sold between 10 AFN (0.14 USD) and 20 AFN (0.28 USD) in season, with peaks up to 41 AFN (0.60 USD) at some specific times of the year.

¹⁶³ Up to an average price of 49 AFN (0.72 USD) per kg.

¹⁶⁴ Only 15% of traded volumes off-season in Nangarhar were domestic. Note however, that it only represents large provincial trading businesses who only traded 24% of the domestic production.

¹⁶⁵ With an estimated farm gate price of 30 AFN per kg. In Kabul and Kandahar, it sits around 15 AFN (0.22 USD) per kg. Nangarhar beneficiaries displayed better results with an average price of 26 AFN (0.38 USD), a 73% increase since the baseline surveys.

¹⁶⁶ Note that one can count two to three harvests in the year in a Greenhouse, one tomato harvest prior to the main season followed by one to two cucumber harvests until December.

Figure 19: Average gross revenue and gross margin for one harvest at baseline and midline¹⁶⁷

This increase of cost of production could extend the expected payback period of investors. In this situation, if grantees avoid maintenance repairs when necessary due to the reduction of their margin, it could question the viability of the greenhouse economic model. As previously mentioned, some unexpected weather condition has already led to unexpected repair work in Kabul, which costs have been covered jointly by the program and its beneficiaries. If maintenance costs were to be avoided by beneficiaries in the future due to cash shortages, it could put in question the viability of the greenhouse itself in the long run. Such low level of maintenance has already been observed on the field and could also partially explain the low yield results of cucumber. At the time of the midline, only 10% of the respondent stated they would be able to afford the repairs in case of an event extensively damaging the greenhouse.

¹⁶⁷ CARD-F M&E data.

5.2 Greenhouse small-scale beneficiary survey findings

Box 1: Profile of beneficiaries with multiple CARD-F's greenhouses

Beneficiaries who invested in multiple CARD-F greenhouses display a similar profile: most are males, between 30 to 40 years old.

Profile 1: HS, owner of three CARD-F's greenhouses in the Beshud district of Nangarhar province. He is 40 years old with high school education. He manages several family businesses in cooperation with two of his brothers. Their activities are spread across several sectors (real estate, a network of gas stations and agriculture). His family invest in agriculture as they already were landowners of 25 jeribs of open land and several greenhouses outside CARD-F. However, they never managed land themselves and rent all these assets to farmers.

Profile 2: MR, owner of three CARD-F's greenhouses in the suburban area of Jalalabad. He is 30 years old and has a bachelor in engineering. He is a civil servant and works at the Ministry of Education. Soon after his graduation, he decided to invest in side businesses. He first invested in a private school. He saw CARD-F's programme as an opportunity of complementary annuities with few personal involvements since they rely on a manager to take care of the farms.

As with the poultry value-chain, the March 2017 surveys of greenhouse small-scale beneficiaries targeted two different groups. The fieldwork targeted the 17 additional "rolling baseline" beneficiaries added since the baseline data collection¹⁶⁸. In addition, 60 beneficiaries were re-interviewed for the midline 1 survey. Out of these, 22 had to be dropped as they could not be matched to the baseline with absolute certainty.

This second wave of the survey has implemented changes. Firstly, as noted in the Approach Section, the income questions were altered to more in line with the NRVA. Complementary questions were added to evaluate training sessions and events provided by CARD-F teams as well as CARD-F's associations. Finally, the loans section was also detailed to better fit specific Islamic loan systems.

Beneficiaries' profiles do not differ much between the baseline and the rolling baseline¹⁶⁹. In fact, the differences are so small that the evaluation team feels confident in grouping the rolling baseline with the baseline survey for future analyses. The remainder of this section will therefore focus on comparing the midline findings with the baseline findings¹⁷⁰.

Owners and managers in Nangarhar

As detailed under section "Owners and managers in Nangarhar" in Annexe 3, Nangarhar managers were on average 36 years old (same as the baseline) but were less literate (23.3% were fully literate vs. 47.6% at the baseline) and had less education (63.6% had no education vs. 38.1% at the baseline). At baseline, Nangarhar owners were 34 years old on average and reported a monthly income per head of 1378 AFN (21 USD). 46.2% were fully literate and 53.8% were illiterate. 46.2% had no schooling and 23.1% went to University. At midline 1, literacy increased from 46.2% to 77% and fewer respondents had no schooling (moving from 46.2% to 22%). Managers continue to report a lower monthly income per head at the midline: 1758 AFN (26 USD) vs 1856 AFN (28 USD) for owners, though this gap has decreased since the baseline. However, there is not enough evidence yet to confirm this shift or assess the contribution of the CARD-F programme to this change.

Basic information on the respondents

Beneficiaries are on average 35 years old¹⁷¹. On average, 23.7% of the beneficiaries are illiterate while 44.7% are fully literate. Furthermore, 23 % of the respondents did not finish any type of education. This

¹⁶⁸ 14 in Kandahar, 3 in Kabul and 0 in Nangarhar.

¹⁶⁹ For example, beneficiaries' age (roughly 35 years old), literacy rates (20-30% being illiterate), as well as their education levels and occupation are broadly similar.

¹⁷⁰ By purely analysing re-interviewed respondents, one can minimize the "noise" that external factors can have on the results.

¹⁷¹ This is true for the baseline, the rolling baseline and the midline survey. The midline survey furthermore showed that respondents from Kabul (45.8) tend to be older than those from Kandahar (33) and Nangarhar (40), but the sample size is arguably too limited.

percentage is highest in Nangarhar (45%). The majority of beneficiaries is engaged in agricultural labour, while 29.8% indicates “other” employment without specifying what this might be.

There was an issue in the interviewee status. At the time of the baseline survey, it was not clear that the CARD-F programme is drawing a distinction between beneficiaries who own the greenhouse and who manage it. While these might be grouped together¹⁷², the evaluation team believes they should be separated. In fact, both the owner and the manager can be seen as beneficiaries of the programme, and the distinction has implications on critical variables¹⁷³. Therefore, the midline survey asked specifically whether the respondent is the owner or the manager. On average, 97.4% of the respondents are the manager of the greenhouse, while 71% of the respondents also owns the greenhouse (see detailed analysis under section “Basic information” in Annexe 3).

Financial circumstances

As mentioned above, the survey’s methodology to assess beneficiaries’ income status has slightly changed. The midline 1 survey did not directly probe average monthly income in March 2017 (see the Approach section above). The evaluation team used two questions at that time to proxy this monthly income.¹⁷⁴ On average, respondents reported a revenue of 4878 AFN per head. This was highest in Kandahar (8196 AFN), followed by Kabul (3643 AFN) and Nangarhar (1802 AFN). While this spread is much larger than what was observed during the baseline, the ranking of the three regions is the same.

However, as was done in the poultry assessment and at DFID’s request, beneficiaries’ possession of durable goods was surveyed to give a further indication of their wealth status. To that extent, the midline results reveals that owners owned more durable goods than managers: 89.9% owned a stove/gas balloon (vs. 81.8% of managers), 89.9% owned a sewing machine (vs. 54.5%), 77.7% owned a TV (vs. 36.4%), 78.8% owned an electric fan (vs. 54.5%), 55.6% owned a motorcycle and 33.3% owned a car as opposed to 0% for both good.

From these numbers, greenhouse beneficiaries seem more affluent than the poultry beneficiaries. This was anticipated, given the significant investment required by greenhouse owners. Due to the low sample size (32), a comparative analysis of the different regions would not be representative. Detailed analysis can be found under sections “Financial situation” and “Poverty indicators” in Annexe 3.

While beneficiaries indicate sound loan portfolios, it is more likely that they have insufficient financial reserves

Only 24% of the respondents indicated that they borrowed money over the past two years¹⁷⁵. Furthermore, only 1 out of 29 respondents indicated they unsuccessfully applied for a loan over the past 12 months, while the other 28 did get the loan. Based on these findings, beneficiaries appear to have sufficient access to credit.

However, loans are likely to be underreported in this survey as people are reluctant to give out details on their household debt due to cultural reasons. When analysing whether people’s level of debt seriously affects the way they make decisions in life, 89% of the people indicated it did, although the low sample size (9) casts doubt on the validity of this finding. More importantly, 52% of the respondents said the loss of their entire production would be critical for their finances, while only 10% would have the necessary finances to completely recover damages or the destruction of their greenhouse. This is in line with the market assessment for large-scale greenhouse beneficiaries, that also indicated that

¹⁷² Indeed, this is what is being done by CARD-F.

¹⁷³ For example, in terms of the financial background of the beneficiary, the owner/investors’ answers might be more relevant, while questions on greenhouse knowledge and/or training attendance should be better directed to the manager.

¹⁷⁴ As the income questions were the questions asked at the baseline, another approach is used. A proxy to measure total income is used based on question F04 What was approximately the share income from the activity that is the main income source of the household” and question F12 “what was approximately the total amount of money from this activity (D04) in the last year. By combining those variables, it is possible to find a proxy of the total revenue earned by each household’s beneficiaries in the past year. this response is obtained by removing the respondents who reported no income and by removing one outlier.

¹⁷⁵ This percentage is highest in Nangarhar (40%), followed by Kabul (16.7%) and Kandahar (0%).

such low financial reserves have contributed to lower greenhouse production yields, particularly in Kabul (see detailed analysis under sections “Financial situation” and “Loans” in Annexe 3).

The project has started for all beneficiaries and greenhouses are being increasingly used

The project has started for all the beneficiaries. It takes some time, however, to start production. This can be observed by looking at the rolling baseline respondents that received the greenhouse later than the midline respondents. Out of this sample of 20 beneficiaries, only 3 (15%) are already using the greenhouse. For the 26 midline respondents, this percentage is significantly higher: 54%. This might, however, still be considered low. This could be attributed to the month of sampling, as March is typically a transition period between saplings production and the start of tomatoes production. Furthermore, as the market assessment indicated, heavy snowfall in the Kabul province caused some damage to large-scale beneficiaries’ greenhouses. It is likely that these adverse weather conditions also affected the small-scale beneficiaries. In the future, the evaluation team is considering asking more targeted questions on any alternative uses of the greenhouse that might not be currently captured.

Interesting, out of the 12 respondents that indicated their greenhouse is not in use yet, 11 are located in Kandahar. This is something which the evaluation team plans to follow up on in midline 2 (see detailed analysis under section “CARD-F Intervention Status” in Annexe 3).

Beneficiaries seem to rely more on “secondary sources” for information on input prices

From the panel analysis, respondents indicate (large) decreases in relying on “primary sources” such as family and community members, other farmers and farming associations at the expense of “secondary sources” such as input traders and retailers. In other words, it appears that households are less prepared in terms of collecting price information on inputs, before making the actual purchase. This could potentially be explained by the high price volatility as identified in the market assessment. Respondents might be aware of this high volatility and not see any use in investigating input prices since they are likely to deviate from the actual price in any case (see detailed analysis in section “Greenhouse inputs, bottlenecks and organisations” under Annexe 3).

Provincial markets are still the major source of inputs, although local markets and imports are on the rise

First of all, provincial markets are still, by far, the major source for inputs, followed by local market and the Kabul market. On the other extreme, households do not (or no longer) seem to rely on agricultural cooperatives, NGOs or farming associations for their inputs.

Although provincial markets are still the major source of inputs, the data reveals that respondents have increased their use of local markets significantly, particularly to source seeds and plants, since the baseline.

Respondents also indicate that they import more inputs from abroad. This is true for all types of inputs. This is somewhat surprising, given that both the border with Pakistan as well as the one with Iran were closed at the time of the survey. However, as the greenhouse market assessment pointed out as well, it is expected that the negative results of this border closure on the import of intermediates will be better picked up during the next midline survey (see detailed analysis in section “Greenhouse inputs, bottlenecks and organisations” under Annexe 3).

Greenhouse beneficiaries experienced increased impediments to production

Weather hazards, crop diseases, the quality and quantity of fertilizer and pesticides as well as low demand and competition from foreign goods presented larger impediments to production in the midline versus the baseline. Indeed, crop diseases were the main impediment to production (90%). This is in line with the greenhouse sector assessment, which highlighted that crop diseases have significantly affected cucumber production.

On the other hand, respondents indicated that issues such as lack of water and land issues are (much) less of an impediment to production now than they were during the baseline (see detailed analysis in section “Greenhouse inputs, bottlenecks and organisations” under Annexe 3).

Membership of agricultural and farming associations has remained largely constant since the baseline

Comparing the cross-sectional averages, membership of agricultural cooperatives has slightly decreased¹⁷⁶ while the membership of farming associations has increased¹⁷⁷. Membership fees have decreased slightly, which could potentially be an explanation for the slight increase in farming association memberships. However, in order to analyse differences over time, it is once again best to look purely at the 38 respondents that were interviewed both during the baseline and the midline. Doing so shows that only 1 respondent that did not have a farming association membership during the baseline now has one, while agricultural cooperative membership has not changed at all. One explanation for the low change in membership is that there has been no recent change in the presence of agricultural cooperatives or farming associations¹⁷⁸. For example, Kabul opened an association in March 2017, Kandahar in March 2016 and Nangarhar in 2014 (see detailed analysis in section “Greenhouse inputs, bottlenecks and organisations” under Annexe 3).

Beneficiaries appreciate the CARD-F training sessions

On average, respondents attended 2.18 CARD-F training sessions, 90% responded said they attend a least one training with 45% attending 3 training sessions. Kabul beneficiaries attended the most training sessions on average (3.22), followed by Kandahar (2.72) and Nangarhar (1.31). Most of the training sessions provided general information (33%) or were on the cultivation of crops in the greenhouses (22 %). Most of them said they gained experience and that it was useful regarding caring for the greenhouse (utilization of fertilizer, dealing with pests, water use) but also on buying products (inputs at the best price and selling products at the best price). Most respondents (75%) said they keep applying advices from the training. Out of the 16 people that only apply “some” of the training, the main lesson that they do not apply more is regarding “Seed and feed mass”, since the respondents rated their own method superior (see detailed analysis in section “Beneficiary experience and knowledge with poultry” under Annexe 3).

Beneficiaries increase activity before land cultivation, although access to fertilizer remains a problem

Those respondents that were interviewed both during the midline and the baseline have increased the extent to which they prepare land (from 79% to 97%) and use pesticides (from 50% to 61%) before cultivating the land. On the other hand, the use of fertilizers (from 68 % to 58%) and crops thinning (from 15.6% to 2.6%) has decreased¹⁷⁹. The fact that the use of fertilizers has decreased is related to an overall impediment to production which is the quality and quantity of fertilizers ((see detailed analysis in section “Greenhouse inputs, bottlenecks and organisations” under Annexe 3).

Hopeful developments in the security situation

Just as in the poultry sector, Greenhouse beneficiaries reported positive developments in the security situation. There were more commercial relationships created and households increased their economic activity in other areas. Indeed, out of the 34% of respondents that indicated that commercial relationship have been affected by conflict during the baseline, 0% of them indicated that during the midline. Also, we see that respondents feel more secure when traveling to markets and view the security situation as less of an impediment to production This result might be surprising, given that there is an increase in civilian casualties in Herat, Kabul, Kandahar and Nangarhar. One explanation for this paradox could be a desensitization of the conflict in Afghanistan (see detailed analysis in section “Conflict” in Annexe 3).

¹⁷⁶ From 7% to 4.5%,

¹⁷⁷ From 35% to 45%.

¹⁷⁸ In the poultry sector, the opening of a women only SSL association could explain the significant increase in poultry association membership. That is not the case here.

¹⁷⁹ 37 out of 38 respondents to this question were the managers of the greenhouse while 27 out of 38 were also the owner.

6.0 Conflict findings

The security situation in Afghanistan remained volatile during the first six months of 2017. The United Nations Assistance Mission in Afghanistan (UNAMA) recorded 5,687 security-related incidents in the first quarter of the year which is the highest total ever recorded for that period since 2001. The second quarter saw a 2% in security-related incidents over the same period in 2016. The number of civilian casualties, however, has remained nearly identical.

The greatest threat to civilian life in the first half of 2017 has been the indiscriminate use of “IED tactics” by anti-government elements in civilian-populated areas. This set of tactics has seen an increase in frequency and in effectiveness¹⁸⁰. Ground engagements were the second leading cause of civilian casualties nation-wide. However, 2016 saw record level civilian casualties from ground engagements, and there has been a 10% decrease so far in 2017¹⁸¹.

Kabul province recorded the highest number of civilian casualties, mainly in Kabul City. Nearly 95% of these casualties resulted from suicide and complex IED attacks carried out by anti-government elements similar to the 31 May VBIED attack near the German Embassy. The second greatest risk to civilian life in Kabul is the violence that often accompanies mass protests and the government’s response to these protests.

ISIL remains active in Nangarhar province where they clash with US and Afghan forces. The group has claimed responsibility for several major attacks in recent months, including the burning of medical facilities and the deliberate destruction of medical equipment in Bati Kot District¹⁸². But the organization may be losing ground in Nangarhar. UNAMA documented a 41% decrease in civilian casualties attributed to ISIL in Nangarhar over the same period in 2016. This drop is likely influenced by intensified joint Afghan and international military operations aimed at removing the group. However, UNAMA also reported an overall 109% increase in nation-wide civilian casualties attributed to ISIL from the same period in 2016.

Fighting has slowed in Kandahar province. Kandahar’s police chief is well known for his hard-line approach to crime and insurgency activities. However, as the fighting has relocated to the periphery of Kandahar, the remnants of war remain a threat. The province recorded the highest number of civilian casualties from unexploded ordnance of any province in Afghanistan in the first half of 2017.

Sectarian violence in Herat province continues, and the civilian casualties in Herat have increased by 14%. For the first time, ISIL claimed responsibility for a remote-controlled detonation in Herat City on 12 May. The Taliban have prevented several development projects from being implemented. The Taliban have tried to levy a tax of 30% of the overall budget on development projects, but they have only successfully interfered with 11 of the 87 projects started in Herat. However, CARD-F is unlikely to be targeted for this type of attention by the Taliban as it is not a large budget infrastructure project and has a small and varied footprint in Herat.

The greatest physical threat to CARD-F beneficiaries is from IEDs, unexploded ordinance, and the indiscriminate use of mortars. While it is difficult to predict where these tactics will be utilized, there is no evidence that the agriculture sector would be of strategic importance. However, producers bringing their goods to market can get caught in ground skirmishes or effected by attacks targeting large gatherings like markets or rush hour traffic. Beneficiaries reported a significant improvement in the security situation in the midline compared to the baseline. This may indicate a certain level of desensitization to the conflict over time. Another potential risk to the project may lie within the CARD-F communities themselves. Participation in the project may lead to resentment between those selected and those not selected. This is not something that the current questionnaire covers, but it should be included for the next data collection.

¹⁸⁰ Accounting for nearly 40% of civilian casualties. This constitutes a 15% increase compared to the same period in 2016

¹⁸¹ UNAMA attributed 65% of civilian casualties by anti-government elements to the Taliban, 7% of civilian casualties by anti-government elements to the Islamic State in Iraq and the Levant (ISIL), predominantly in Kabul and Nangarhar Provinces.

¹⁸² Indeed, 26 of the 37 attacks attributed to ISIL in Nangarhar province in the past six months targeted civilians or civilian objects including vehicles, buildings, and equipment.

7.0 Conclusion

The approach taken for the evaluation of CARD-F activities, developed in the Inception Report, planned for two mid-term evaluations, the first one conducted about one year after the baseline research, the second in year 2. The objective for this is to allow the CARD-F team to revise the programme's theory of change and adapt its activities, should the need for corrective actions be identified.

As already mentioned, CARD-F roll-out was slower than originally planned and the fieldwork for the first midline was also slightly anticipated. As a result, so many beneficiaries had only recently started their CARD-F-sponsored activity, which limited the extent of the outcomes the evaluation team was able to identify. While it is too early to gauge the impact of the program, it is expected that the next midline review will yield more interesting results.

However, data collected this year shows promising results: poultry activities generated a significant increase in income for small-scale layer farms beneficiaries; large-scale poultry ventures seem sustainably profitable, and the variety of activities implemented is a very good step towards building a strong and reliable poultry value-chain in Herat and Kandahar. Greenhouses are also profitable overall, although maybe not yet to the extent anticipated. The intervention in both value chains has already succeed in generating quite a lot of value, positively contributing to the agricultural trade balance. The number of jobs created is probably not yet at the expected level, but the continuous development of the value chains give hope for the near future, in particular as the market for Afghan-made poultry products and off-season fruit and vegetable is far from reaching saturation.

In themselves, these results show that the intervention logic is so far successful, even if some transient challenges have impeded its effectiveness. Not all parts of the theory of change have been tested yet however: interventions aiming at facilitating an enabling environment or private investment without CARD-F financial assistance have yet to be implemented: both are necessary for the value chains to be fully sustainable. The resilience of SSLs and greenhouse to shocks is yet unknown. But these preliminary results do not seem to require any change in the theory of change so far.

Despite its limitations, this midline evaluation showed a few areas for consideration by the CARD-F team. In both value-chains, the supply-chain for inputs is not yet satisfactory, in terms of regularity, volume and quality of the inputs supplied. Further development of local supply-chains will help lower the impact of events such as border issues, which significantly disrupted the results this year. Capacity building and constant mentoring over time are probably among the main assets of the programme design and will be particularly important in the first few months after launch of large-scale facilities. Regular follow-up and mentoring is also important for small-scale beneficiaries, as their level of technical knowledge and financial resilience make some of them unlikely to recover from unexpected issues.