Agricultural Development in Northern Afghanistan
Strategic Coordination for Sustainable Development and Resilience Building in a Conflict Environment



Peter How, MSc, International Development
BsC World Agriculture
Agriculture Director

Mazar e-Sharif, Afghanistan

Joint Development Associates International

Overview

Northern Afghanistan Overview

Northern Afghanistan is a large producer of dryland wheat, as well as a producer of perennial and annual fruit and vegetables, notably near the populated centers which provide ready markets. Its wheat rotations include rice-wheat systems and more conventional wheat rotations with high potential oilseeds, pulses, and melons. On-farm power is limited, and in general agronomy is basic with practice struggling to meet the increasing demand for better quality produce. Costs of production tend to be high and yields low.

Afghan agricultural systems are complex, diverse and risk-prone, soils are low in organic matter, water is limited and the political and social environment is highly challenging, heightening the costs of investment and need for confidence in high returns on investment.

Profiling JDAI

JDAI has been present in northern Afghanistan for 15 years, with a strong specialty in high quality agricultural interventions, concentrating on the development of more resilient, sustainable annual cropping in marginal and more commercial environments of northern Afghanistan.

JDAI also conducts BLiSS and WASH programs for rural women, and fosters a staff culture of professional development, values learning and good development practices.

How JDAI Works

- We have implemented targeted value chains work in oilseeds, pulses, strawberries and wheat, but also recognize that farms operate as integrated systems, and so individual enterprises (e.g. crops) do not operate independently of horizontal linkages to others.
- We have implemented successful projects in developing appropriate mechanization and its supply chains; Conservation Agriculture; work with Balkh and Faryab University Faculty of Agriculture; introduction of strawberry and safflower; extensive work throughout the wheat value chain.
- We work in agricultural education, research, extension, and with the private sector leveraging complementarity between these for sustainable development and added value. We draw on international expertise and best practice where necessary.
- We recruit and retain specialists and experts, both Afghan and international, to deliver high quality interventions and take professional development seriously.
- We work to facilitate local leadership to the highest level possible. We maintain a strong agricultural development staff and capability to model and implement excellent development directly, and frequently have direct and supervised implementation strategies working side-by-side.
- We are a learning organization with a Monitoring Evaluation and Learning function which provides accountability, reporting content, and critically, high quality data that can feed rapid adjustments in project management and strategic decision making going forward.

Better practice:
Weed Control, mechanical & chemical

Situation

- Weeds reduce wheat yields by >30%
- Farmers are unclear about key control mechanisms for weeds.
- Herbicides are available in the market and are handled, stored, and used improperly, creating human health and environmental risks.
- Cheap, ineffective spraying equipment is in the market.

Solution

- Weed control training to 31,000 farmers to date
- Strengthening supply chain and improving product offerings

Observations

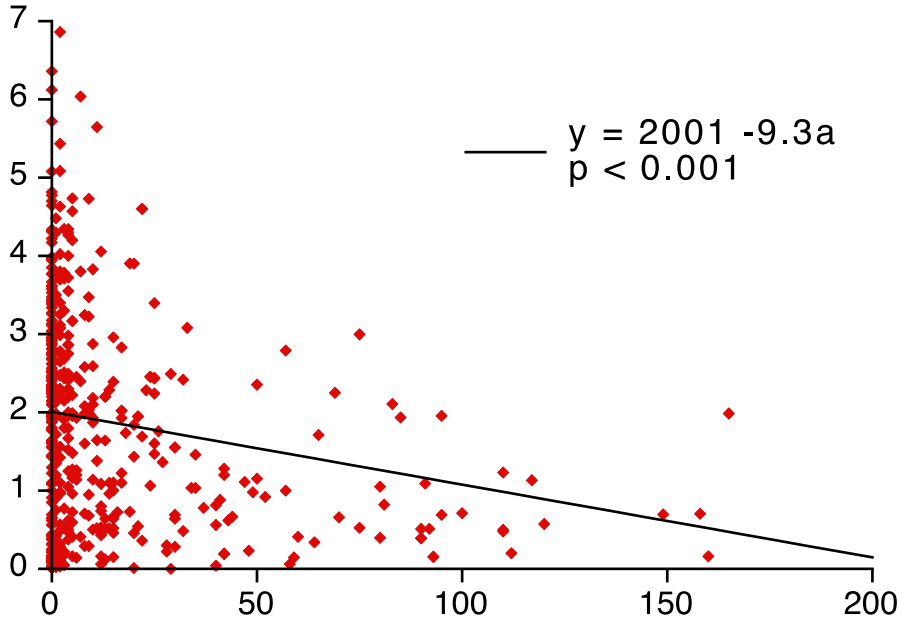
- 3,300 trainees in 2015/16 season used improved weed control and increased their yields by an average of 33% which was an equivalent to $643,230 of wheat.
- Farmers respond very positively to the training, quickly identifying with the problem of weeds and of miss-handled herbicides.
- Farmers adopt safety, storage and need for personal protection and are seen using PPE after training.

Weed Control

In 2011, JDAI assessed the scale of wheat crop damage due to weeds. As a result, JDAI developed weed control training, which has been refined through six years of training. The chart below (2011) shows that grass weeds caused over 9 kg of wheat loss per square meter, and that yields can increase 30% by spraying fields to control weeds, a replicable result.

Women's groups have asked for and received training (right). While JDAI is not aware of women then spraying in the field, JDAI has heard numerous stories of how this has positively influenced men's practice.

Plot and regression line of wheat grain yield vs grass weed heads per m^2 from 435 quadrats and 64 fields including demonstrations and farmers own management.





Weed Control Training

Maintenance training for back pack sprayers



Wheat is hard to find in this weedy Samangan field!



Seed Sector Strengthening through Seed Business Development

Situation

- Farmers primarily access seed through the informal sector. Certified seed has not been stocked for retail to farmers, is expensive, and is not well known or trusted by farmers.
- The formal seed sector is an important way to introduce disease-resistant seed.
- The formal sector has been highly oriented to government buying, with varieties and prices that suit these programs and not necessarily farmers, especially for more marginal environments.
- In years when government buying has not materialized, seed companies have gone out of business, indicating the reliance on government purchases, and the risk of losing a critical player in the agricultural sector.

Solution

- Develop a farmer-focused approach for improvements in the product and strengthening the resilience of seed businesses.
- Improve access through reduced prices, smaller packs, and more outlets for sale. Also support mobile marketing campaigns.
- Drive sales and marketing and improve trust between farmer and company, and the knowledge of variety performance, and therefore selection, by working with private seed companies to implement demonstrations in villages in a PVS style format.

Observations

Farmers are skilled at evaluating varieties grown side by side in their fields.

- Farmers are ready to buy seed when connected directly to companies and appreciate the 7kg packs since they commonly divide 50kg bags amongst neighbors anyway.
- Seed companies see the potential to build a reliable core business in selling seed directly to farmers, without the worry around government contracts which may or may not materialize.
- There remains a problem in finding improved varieties for rainfed environments to outperform old or local varieties: old varieties are grown in these areas even though farmers know they have significant problems.
- The development of a market driven sector is still undermined by government buying of seed on large scales for distribution – and with little reliable forward signaling of plans. These large buys also incentivize adulteration of seed which is difficult to control – undermining quality and trust in certified seed and hence a real market.

Seed Business Development

Farmers receive a sample pack of different varieties to try on their own land. These same 7kg packs are made available for sale in new outlets and have reduced barriers to entry for farmers and resulted in increased sales of certified seed.

All available varieties are also grown at a centralized location so that the group can meet and observe the full range of varieties develop though the season.





Better practice: Conservation Agriculture

Situation

- Moisture is limited and soil organic matter is very low: production is highly variable depending on rainfall and is vulnerable.
- Agronomy is basic or crude and lacks sustainability: many interventions are rapid and reward short-term results but are weaker in building medium-term resilience or have a benefits ceiling.
- Farm power is limited and its strengths or opportunities are not known.

Solution

- Higher quality, longer term training of farmers to develop more sustainable and resilient systems, including improvement of soil health.
- Participatory appraisals of existing farm systems, budgeting, development of management and monitoring plans.
- Farmers are supported with technical assistance and cost coverage of perceived risks of change.
- Farmers lead in the development of more sustainable, productive CA systems with reduced tillage, increased soil cover, and diversified rotation.

Seeding wheat into rice stubble with reduced tillage saves cultivations, time, and money.



Conservation Agriculture

Lead farmers keep 20 trainees informed on their progress in developing CA systems for their farms, whilst only in the first year many are already planning on expanding their CA plots, and some trainees plan to experiment with aspects of CA on their own farms. The important aspects are different in different locations and outcomes can be unforeseen: for example, the use of mulch had a big impact in one Baghlan village when a CA plot continued to grow well through a freezing period, whilst other crops yellowed.

Farmers analyze their farms using mapping and budgeting tools.



A CO2 burst, soil respiration test showed 50% higher CO2 from CA plots in the first year. Soil health monitoring is an important part of the conversion process.



Mechanization: Contract Harvesting, the utilization of idle two-wheel tractors (2WT)

- Situation:
  - Up to 30% of expenditure on wheat is for harvesting, contributing to an uncompetitive product.
  - Hundreds of reapers were distributed under previous projects, but farmers did not know how to use them and they have been idle.
- Solution:
  - Rehabilitate and commission idle reapers, with training in operation, maintenance, safety and business development for ‘micro-contractors.’

- Observations:
  - Operators have generated significant revenues by reaping other farmers fields.
  - Clients have also reduced their costs of production.
  - Earlier harvest makes fields available for more effective summer season weed control and / or the establishment of second season crops.

Contract Harvesting

In the 2015 harvest season 30 idle reapers were repaired and farmers trained in operation, maintenance, safety and business development. By the end of the season they had worked for 165 clients and harvested 1,486 jeribs (297 hectares) of land earning about $15,000 and saving their clients about double that: see table below.

In 2016 JDAI worked with 185 contractors who reaped 8,105 jeribs for 899 clients taking $37,410 in fees.

Province	District	No. of Farmers	Area Reaped (Jerib)
Jawzjan	Sheberghan	32	764
	Faizabad	32	265
Balkh	Sholgara	26	123
	Dawlatabad	15	137
Samangan	Aybak	18	78.5
	Hazrat Sultan	12	51
Baghlan	Dahne Ghori	6	29.5
	Puli Khumri	24	38
	TOTAL	165	1,486



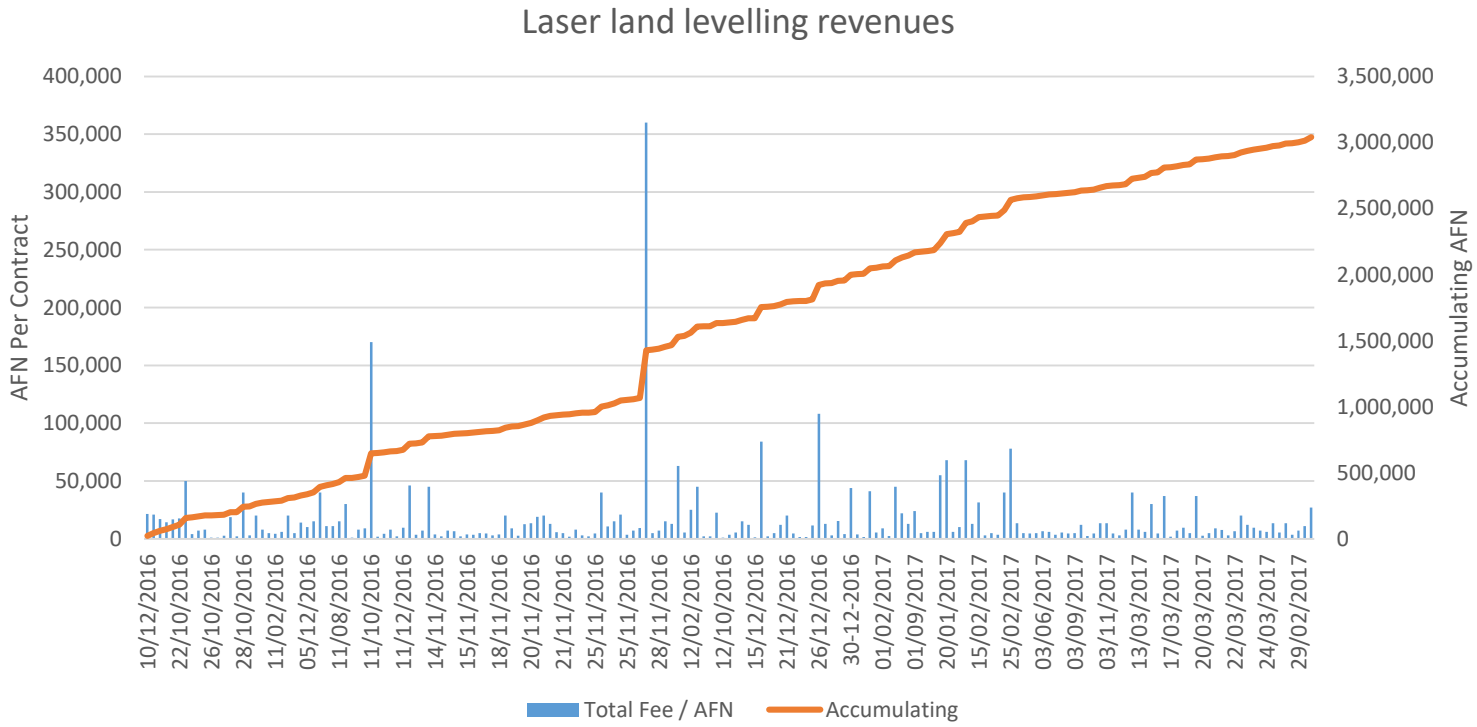
Mechanization: Laser land levelling (LLL), the mobilization of new agricultural service provision

- Situation:
  - Uneven fields and small plots have land wasted under irrigation infrastructure: crops are over-watered in dips, and under-watered on higher areas.
  - Irrigating uneven land takes a lot of labor and wastes water; it means the washing of highly mobile nitrogen fertilizers from higher to lower areas, resulting in under and over dosing of crops.
- Solution:
  - Laser land levelling allows for increased planting area due to larger plots; allows the use of simple mechanization for seeding and reaping for further savings and improved production; results in much quicker, cheaper irrigation and more efficient use of water and fertilizers: reducing costs and increasing yields.

- Observations:
  - JDAI subsidized LLL units, using an established importer to open this new product line.
  - New operators are generating revenues in their businesses, and clients say that their yields increased by over 50% and they plan to increase LLL land year over year.



Laser land levelling private contract operations in first 6 months.



The first 13 LLL owners have from October ‘16 - April ‘17:

- 184 private contracts
- 294 ha of land levelled
- $44,706 of combined fees
- 2,761 hours of operations

Establish market linkages to downstream processors: Mills, specialty food manufacturers, and back

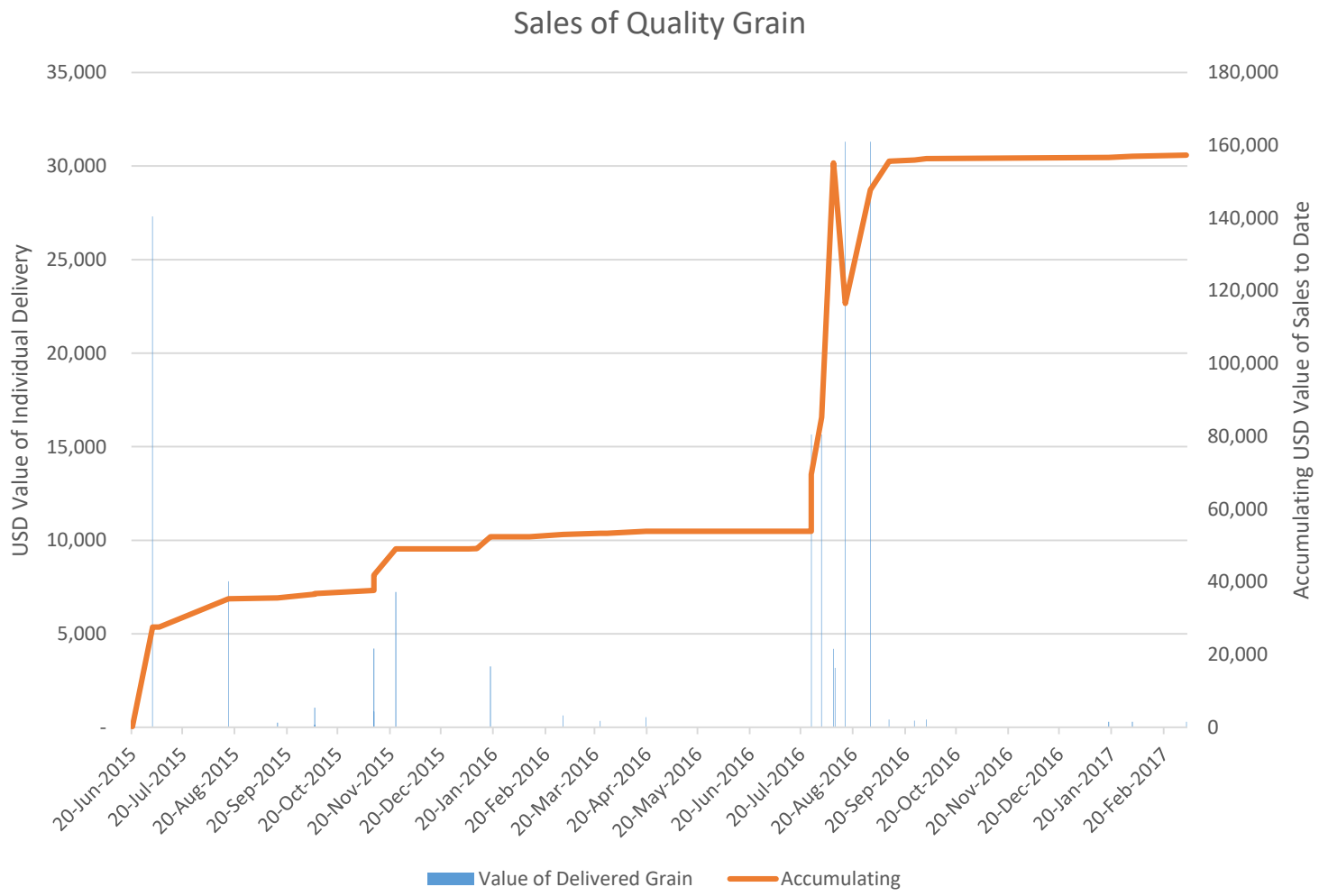
- Situation:
  - Most of the national crop is processed locally and consumed at home, commercial processors use cheap imported grain: the two value chains are detached.
  - Food manufacturers lack consistency in quality of supply and do not have a mechanism for identifying adequate quantities of consistent, appropriate, quality raw materials.
  - Farmers are not aware of quality parameters that are important for commercial value chains.

- Solution:
  - Multi-stakeholder meetings with locally grown grain processed and manufactured locally generates understanding between market nodes of downstream quality requirements and upstream potential.
  - These linkage meetings begin relationships and build trust needed to stimulate improved and reliable production, and better markets.

- Observations:
  - Seed companies have established a new enterprise of aggregating quality-assured grain to specification for processors and manufacturers.
  - Contracts for delivery have been signed with premiums paid for quality grain and producers are stimulated to produce improved grain to specification.



Market linkage work leads to contracts and sales





Sher Abad Seed Company unloads certified wheat seed distribution pilot project in Dawlat Abad district on December 11.

Ongoing relationship with Balkh University Faculty of Agriculture









JDAI has worked with universities to enhance curriculum, develop a university farm, and implement internship programs. With progress in staff capacity over the last 10 years these partnerships could develop into more advanced areas of developing international partnerships in leading adaptive and applied research.

This relationship with BUFA reflects JDAI's ongoing commitment to impact both the current and future generations of Afghan farmers and agricultural scientists so that they can help their country implement sustainable economic change.

