

Farming system of Helmand province, Afghanistan

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Abstract

The study on farming system of Helmand Province, Afghanistan was carried out in Helmand Province. It is the largest province by area, covering 58,584 square kilometers (20,000 sq mi) area. The province contains 13 districts, encompassing over 1,000 villages, and roughly 879,500 settled people. Lashkar Gah serves as the provincial capital. Helmand Province has irregular highlands which gradually increase in elevation in the northern and southern parts of the province. The Helmand River is the longest river in Afghanistan and it flows through the center of the province. The Helmand River Valley Project provides river and canal irrigation for approximately 150,000 hectares. Field crops such as wheat, barley, maize, and mung beans are produced where irrigation is supportive. The climatic environment is favorable to double cropping (winter and summer crop on same land) throughout the province. Industrial crops such as cotton, peanuts, and now soybeans are grown on a limited scale due to the lack of processing capacity. Vegetable production is almost exclusively subsistence based with some surplus being sold locally. Fruit and nut cultivation exists, but not on a large commercial basis and is predominate in the northern zone of the province that is served by karez and well irrigation. Livestock and poultry are raised throughout the province for local consumption. Alluvial sub soils with loses top soils are common in flatland areas. These are calcareous soils with relatively high calcium carbonate (CaCO₃) contents. Consequently, soil pH is generally high ranging 8.0 – 8.5. The Helmand farming system can be divided in the northern (orchards, irrigation from underground water) and the southern (principally field crops and surface water irrigation). The third farming system is the Kuchi livestock keeping system, whereby there are long range Kuchi people of community migrating into Farah, Uruzgan and the shorter range Kuchi, who basically live in and around Registan.

Keywords: Farming system, Helmand province, Afghanistan

Introduction

Helmand or Hillmand is one of the 34 provinces of Afghanistan, in the south of the country. The northern part of the province does not have direct access to the river and relies on irrigation water from natural springs and groundwater that flow into karez. Deep tube wells have been dug in the north to offset the decrease in karez irrigation due to drought, which has led to depletion of groundwater supplies. Helmand province has an estimated population of 850,000 residents, and 94% is rural. Pashtun tribes constitute over 90% of the ethnic population with the balance being primarily Baluchs who reside in the southern part of the province. The literacy rate in Helmand is about 5% with women representing only 1% of the total. The Kuchi population is virtually illiterate and numbers around 100,000 in the winter with about 20% being settled. Helmand agriculture has a history of strong production due to the extensive irrigation system built by the United States over 40 years ago. Field crops such as wheat, barley, maize, and mung beans are produced where irrigation is supportive. The climatic environment is favorable to double cropping (winter and summer crop on same land) throughout the province. Industrial crops such as cotton, peanuts, and now soybeans are grown on a limited scale due to the lack of processing capacity. Vegetable production is almost exclusively subsistence based with some surplus being sold locally. Fruit and nut cultivation exists, but not on a large

commercial basis and is predominate in the northern zone of the province that is served by karez and well irrigation. Livestock and poultry are raised throughout the province for local consumption. A farmer would be considered a laborer if he farms for the landowner and is provided with shelter and paid with money and goods. Bazgari or sharecropping is very common where the landowner supplies the land and some percentage of inputs. The agreement will stipulate the percentage of harvest the farmer will retain based on the amount of investment by the landowner in seed, fertilizer, fuel, machinery and the agreed upon value of the land. If the farmer only contributes his labor; the normal sharecrop rate would be 20 – 25% of the yield. A third contract option is utilized where a lease is created allowing for a longer term agreement of up to 5 years for a set rental rate or an amount of commodity produced on the land. This method is particularly favored for horticultural production from orchards.

Natural Resources of the Province

Helmand Province is very rich with natural resources in particular with potential that exists in the province for Agriculture, Livestock, Fishery, Poultry, Forestry, and Horticulture because of Fertile and deep soils, the natural water resources and irrigation infrastructure present. Helmand could be divided into 2 parts in terms of water resources: (i) southern Helmand and (ii) Northern Helmand.

i) Southern Helmand

Has got one main river, Helmand River that is flowing throughout the province in the southern part and irrigates almost 70% of the agricultural lands of the province. On top of that Helmand has got the Kajaki Dam, which helps the province with irrigation capacity and with hydraulic power generation capacity. The Helmand River has got 3 main canals separated from it in 3 parts of the province under a project in the past:

1. Bughra Canal with the intake on Helmand River in Grishk district flowing through Grishk to Marja district with 70 M³ /Sec original flow capacity irrigating over 60,000/geribs of land.
2. Darvishan Canal with Intake on Helmand River in Darvishan flowing all over Garmseer district in Lakarai, Binadir irrigating around 50,000/geribs of land in Garmseer district.
3. Shamalan Canal with Intake on Helmand River in Bolan bridge area, flowing in Nawa district through Sourkhodoz irrigating around 40,000/geribs of land. There are many sub canals from the above mentioned 3 canals as well as many traditional canals on Helmand River made by the villagers.

ii) Northern Helmand

Is covering the parts of Nawzad, Baghni, Baghran and other districts located in the north of the province where Helmand River doesn't flow through and it doesn't play a role in the agriculture of the area. The main source of water used to be karezes and natural springs. Helmand has got a very big natural forest all the way along the river on both sides. The main trees are Tamarix and the forest is mainly used as grazing area for the livestock of the farmers and Kuchi. Helmand has got capacity for more artificial forestry where drought resistance trees such as Tamarix, Saxaul and other trees such as Eucalyptus and pine trees could be grown. In the agricultural field Helmand has got potential and suitable climate for long season cultivation of cereal crops, industrial crops as well as orchards. Especially in southern-Helmand 3 crops a year are possible. Helmand capacity for livestock production is also very high, the possibility to produce year-round fodder under irrigation (lucerne, berseem, green maize/sorghum) would make dairy development, if accompanied with the build-up of processing capacity. Helmand has the potential for fish production, especially on the soils destroyed by salination which are no longer suitable for irrigation, but still within reach of water and poultry production due to the presence of grain. Helmand has got marble mines in Deshu district in the Registan sandy deserts bordering Pakistan. This is one of the highest quality marble in the country, but due to the lack of roads inaccessible from the Afghan side and currently apparently being smuggled to neighboring countries.

Soils of Helmand Province

Alluvial sub soils with loess top soils are common in flatland areas. These are calcareous soils with relatively high calcium carbonate (CaCO₃) contents. Consequently, soil pH is generally high ranging 8.0 – 8.5. These soils respond well to tillage and nutrients. Due to the high silt percentage, flood and furrow irrigation is possible. Poor drainage systems and

desertification contribute to significant soil salinization due to mineralization. Upland areas are likely to be very gravelly due to detrital type formations, but have the same high CaCO₃ characteristic as the alluvium soils in the valleys. These soils will sustain forages and orchards if sufficient water is available and will respond well to nitrogen applications.

Land tenure

There are 3 types of land tenure in the province.

1. **State land:** State land is available and is almost always either mountainous or without water. Especially the last category could provide good potential for implementation of future developmental projects, although an unauthorized and illegal occupation is rampant and government is not paying attention to it at all. If this process of impunity continues there will soon be no state land left for any future planning and projections.
2. **Private land:** Private land belongs to people on the basis of heritance being distributed among the heirs. In certain cases it has either been given centuries ago by the governments of that time to the people or the people have just simply occupied the vacant lands and then it became their properties by laps of years and time.
3. **Helmand Project land, destined for privatization:** The final category of land is part of state land that falls under a state agriculture extension project, which was planned before the 70s and had to be distributed to landless people, in particular from other provinces in the time in Marja, Nadi Ali, Bolan and Garmseer. This land allocation was based on a proper plan of the government and distributed on the basis of soil fertility, meaning that good and fertile land within the project area up to 30 geribs (6 Ha) per family and less fertile land up to 50 geribs (10 Ha) per family.

Agriculture in Helmand Province

Helmand Economy prior to the war and still now is 75-80% based on Agriculture 15-20% on Livestock and 5% on services. There is no manufacturing industry of any significance. As mentioned above Helmand used to be the potential area for agriculture in the region therefore the governments prior to 1970s have paid much attention to use the available potential to the maximum extent possible. Key agricultural activities are cultivation of cereal crops, vegetables, orchards as well as industrial crops.

Crop Production

Winter wheat is the predominant cultivated crop for Helmand. Barley is also a winter grain crop that is produced on a smaller area, but is an important crop. Maize (corn) is the largest crop produced in the summer. Wheat, barley, and corn are all grain crops which are critical to food security. They are grain crops that produce maximum levels of storable food per hectare. This is an extremely important fact to realize when considering any shifts in production in the Helmand agricultural system. Certified seed for wheat and barley is critical for good yield potential. Hybrid corn seed is a must for acceptable production. Quality seed and nutrient management are opportunities for improvement in the Helmand agricultural system.

Table 1

Commodity	Area (Ha)	Yield (mtons)	Farm Value (Afs)
Wheat	72000	188000	5.55 billion
Barley	12174	24592	676.28 million
Maize	10418	16252	292.54 million

MAIL

Table 2

Crop Calendar – Helmand			
Crop	Fall Planting	Spring/Summer Planting	Harvest
Wheat (winter)	15 Oct - 1 Dec		20 May - 1 Jul
Barley	15 Oct - 1 Dec		15 May - 15 Jun
Onion, Turnip, Carrots, Spinach, Radish, etc	1 Sep - 1 Nov		1 Mar - 15 Apr
Clover	21 Sep - 1 Nov		10 Mar - 1 May
Alfalfa	15 Sep - 1 Nov		Perennial
Maize		1 May - 1 Jul	15 Sep - 1 Nov
Cotton		1 May - 1 Jul	1 Oct - 30 Dec
Peanuts		1 May - 15 Jun	1 Sep - 1 Nov
Soybean		15 Apr - 1 Jul	15 Sep - 1 Dec
Cucurbits		1 Apr - 15 May	1 Jul - 15 Aug
Mung Beans		1 Apr - 30 May	1 Sep - 15 Oct

Table 3

Crop	Seeding Rate		Fertilizer Rate: DAP at planting - Urea following			
	Kg/ha	Kg/jerib	DAP kg/ha	DAP Kg/jerib	Urea kg/ha	Urea Kg/jerib
Wheat	100	20	100	20	200	40
Barley	75	15	90	18	180	36
Maize	50	10	100	20	300	60
Cotton	20	4	100	20	150	30
Peanuts	100	20	50	10	0	0
Soybeans	50	10	50	10	0	0

1 jerib = 0.2 hectares

Industrial crops are oilseed crops such as cotton, peanuts and soybeans. These are also high protein commodities which would supplement human nutrition as well as enhance livestock and poultry production. Peanuts and soybeans are legumes which fix their own nitrogen making them excellent rotation crops providing some nitrogen for the following winter grain crop.

Vegetable Production

Vegetables are grown almost exclusively for subsistence in compound gardens. Centralized grading and packing facilities do not exist in key production zones which would need to be supported by vegetable producers associations for commercial production to be viable.

Common vegetables grown

Potato	Pepper	Carrots	Watermelon
Onion	Cabbage	Turnip	Cantaloupe
Tomato	Spinach	Radish	Okra
Eggplant	Lettuce	Cucumber	Leek

Fruit Production

Commercial fruit production is increasing due to efforts of

many donor organizations. However, as the chart below indicates; only a minimal amount of production exists. Orchards are principally in Northern Helmand (almonds, apricots, pomegranates and grapes), but nursery production is viable in the central districts. Recognizing the limitation of high value fruit production as an alternative to poppy is a critical concept that must be accepted.

Table 4

Commercial Fruit Production in Helmand									
Peaches		Almond		Pomegranate		Apple		Grape	
Mtons	Ha	mtons	Ha	mtons	Ha	mtons	Ha	mtons	Ha
120	15	300	60	1440	120	350	50	4500	300

MAIL

Livestock and Poultry

Farmers raise milking cows, sheep, goats, donkey and chickens for producing of milk, meat, eggs for family consumption and market and transportation. Helmand has water, forages and pastures which is conducive to livestock production for both Kuchi and static farmers. Chickens, ducks, and turkeys are raised for domestic consumption with any surplus of chicken eggs produced being sold by the women of the households.

Table 5

Helmand	Percentage Owned Household (HH)		Number of Animals		Avg Herd/Flock Size per HH	
Animal	Kuchi	Rural	Kuchi	Rural	Kuchi	Rural
Cattle	6	57	222	219456	1	1.9
Oxen	0	6	0	17064	0	1.4

Horses	0	2	0	8856	0	2.3
Donkeys	88	21	9879	47736	3.2	1.1
Camels	31	0	5550	216	4.3	1.2
Goats	97	45	133866	943488	5	1
Sheep	94	57	110445	1114344	33.2	9.6
Poultry	91	71	29637	1793232	9.2	12.5

Fisheries

Helmand has got very good capacity for fishery, but fish farms are not yet common in large quantity, very less farmers started fish farming recently, however, fishing is a good business for number of people in the province in particular in Grishk and other parts located along the Helmand River.

Dairy

Milk production is an important subsistence activity throughout Helmand. Cattle, sheep and goats are milked for human consumption. Although forage production does exist; the amount of land available limits the number of animals that can be maintained. The shortage of protein feeds will limit productivity of dairy animals and must be addressed in the future. The Bolan Dairy Farm was started with the objectives of breeding, production and processing. The farm has adequate resources for forage and pastures and may have the capacity for investment as a part of a larger agricultural development plan. The facility could support the development of small farmer dairy production with central facilities for veterinary care, breeding services, extension training and milk processing.

Conclusion and Recommendations

1. Productivity- Farming system provides an opportunity to increase economic yield per unit area per unit time by virtue of intensification of crop and allied enterprises.
2. Profitability - The system as a whole provides an opportunity to make use of produce/waste material of one enterprise as an input in another enterprise at low/no cost.
3. Potentiality – Soil health, a key factor for sustainability is getting deteriorated and polluted due to faulty agricultural management practices viz., excessive use of inorganic fertilizers, pesticides, herbicides, high intensity irrigation etc.
4. Balanced food- In farming system, diverse enterprises are involved and they produce different sources of nutrition namely proteins, carbohydrates, fats & minerals etc form the same unit land, which helps in solving the malnutrition problem prevalent among the marginal and sub-marginal farming households.
5. Environmental safety- The very nature of farming system is to make use or conserve the by-product/waste product of one component as input in another component and use of bio-control measures for pest & disease control.
6. Saving energy- Availability of fossil fuel has been declining at a rapid rate leading to a situation where in the whole world may suffer for want of fossil fuel by 2030 AD. In farming system, effective recycling of organic wastes to generate energy from biogas plants can mitigate to certain extent this energy crisis.
7. Meeting fodder crises- In IFS every inch of land area is effectively utilized. Alley cropping or growing fodder legume along the border or water courses, intensification of cropping including fodder legumes in cropping systems

helps to produce the required fodder and greatly relieve the problem of non-availability of fodder to livestock component of the farming system.

8. Employment generation- Various farm enterprises viz., crop + livestock or any other allied enterprise in the farming system would increase labour requirement significantly and would help solve the problem of under employment. An IF provides enough scope to employ family labour round the year.
9. Scope for establishment of agro- industries- When once the produce from different components in IFS is increased to a commercial level there will be surplus for value addition in the region leading to the establishment of agro-industries.

The salient recommendation for Helmand Province has been given as in the following.

- Rehabilitation of major canal control structures, silt removal from primary canals, repairing secondary and tertiary mechanical control devices, and improving drainage.
- Revitalize current and create additional Research/Training/Demonstration farms with trained extension workers to assist the farmers with new agricultural methods and crops.
- Support mechanized agricultural systems such as water saving drip irrigation for higher value horticultural crops.
- Establishment of a dairy farm with milk processing facilities to support the development of small holder dairy farms.
- Support the creation of farmers' associations to support their capacity building and provide assistance with credit, machinery, and improved seed.
- Initiate the foundation of financial services for agricultural credit and banking.
- Assist Kuchi and livestock owners with forming associations and subsequent operational capacity building with objectives of marketing and provision of restocking credits.
- Encourage the introduction of new cash crops with market potential to improve local economies and as an alternative to poppy cultivation.

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