



Current Agricultural Conditions and Constraints in Paktya Province of Afghanistan

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Abstract Agriculture is the backbone of economy of Paktya Province in Afghanistan with more than 80% people engages in agriculture for their livelihoods. In spite of such a large workforce involves in this activity, the outcomes are not very satisfied. A survey was conducted to discuss current conditions of agricultural sectors and constraints of agriculture in Paktya province. Survey was done in accordance with a questionnaire sheet on current agricultural condition and constraints. As per the survey it was found that majority of farmers use traditional farming methods and have very poor technical knowledge in agriculture. The low productivity and fertility of soils as well as the lack of irrigation water were identified as major factors causing low agricultural production at the research area. In addition, 32.4% of responded farmers answered soil erosion happens very severely and 50.0% answered soil erosion happens severely. It means that more than 80% of farmers require the proper conservation strategies for holding soil fertility. It was considered that soil degradation caused by erosion phenomena with high intensity rainfall causes low holding capacities of nutrients and water of soils. The development of proper conservation strategies as well as farmers education on proper soil management is indispensable to achieve sustainable agriculture in Paktya Province, Afghanistan.

Keywords Afghanistan, agriculture, constraints, condition, Paktya

INTRODUCTION

Afghanistan is a landlocked country located in the central of Asia. It is bordered by Pakistan to the south and the east, Iran to the west, Turkmenistan, Uzbekistan and Tajikistan to the north and China to the far northeast. The rugged terrain of Afghanistan shares the world's highest mountain ranges, Himalayas, Pamirs and Hindukush rising over 7,000 m and running from north east to south west. In Afghanistan, over 80% of the population relies directly on the natural resources to meet their daily needs. However, the United Nations Environmental Programme UNEP (2003) showed that two and a half decades of war and continuous drought have resulted in widespread environmental degradation throughout the country, which also raise a serious threat to the future of Afghan livelihoods.

Afghanistan's climate is unique. The region is a center of origin for many fruits and nuts. Afghanistan is not blessed with many riches in resources, but perennial crops and the hard working Afghan farmers are a superior resource that can correspond to international market. Afghanistan's agriculture is the employment engine of the country. About 84% of the country's population is either directly involved in or related to farming activities.

Afghanistan has 34 provinces; one of these provinces is Paktya. It is located in the southern region of Kabul Province and has borders with Logar, Ghazni, Paktika and Khost Provinces, to the north it has

borders with Pakistan as shown in Fig. 1. The total area is 6,259 km² and 65.1% of the province is mountainous/semi-mountainous terrain while a little more than one third (32.3%) of the area is made up of flat lands as shown in Table 1 (Harris, 2012). This province is divided to 14 districts; the capital is Gardez. According to the National Statistical Department, the total population of the province is less than one million households with an average of eight members in each household (CSO, 2010).



Fig. 1 Paktya Province map

Paktya has an agricultural based economy. In Afghanistan, the agriculture sector contributes 26% of the country’s GDP (IRACSO, 2010), while the industry sector shares only 25%. Within the industry sector, mainly products come from very small scale agriculture based industries. It is estimated that approximately 94% of population living in the rural areas are engaging in agriculture related activities, also 80% work as agricultural labors/workforce in farmlands. Most of these agriculture related activities fall within small scale production systems with only a few farmers being self-sufficient.

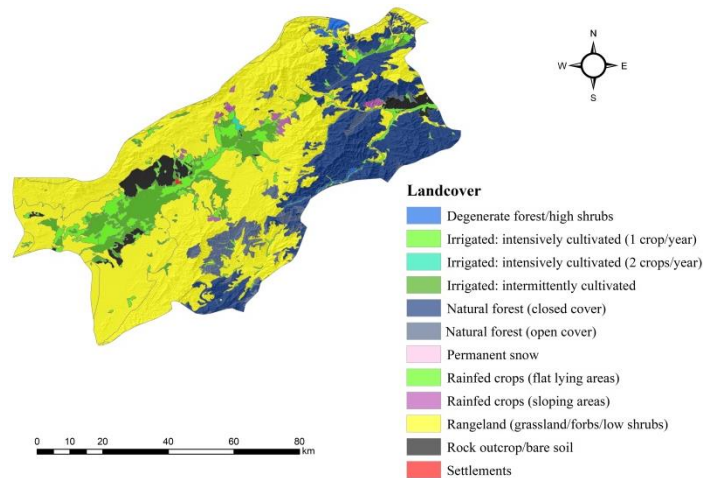


Fig. 2 Land cover map of Paktya Province

According to land cover classification of Paktya by FAO (2014), huge areas are covered by rangeland and forests. Similarly, ArcGIS map showed large areas covered by forest and rangeland as shown in Fig. 2. Wheat is a culturally most significant crop in the province and a staple food for all Afghans. Wheat is grown on an area of 21,105 ha with a production of 75,203 Mt (MAIL, 2014). Cereals like barley, maize or rice are the other important food grains. Approximately 90% of wheat is

fall-planted and the rest is spring planted, with around 80% produced from irrigated lands and only 20% from rain-fed areas. Although wheat straw has a relatively low nutrition for livestock, it is used for livestock feeding. Therefore, higher seed rates are recommended to meet the additional need of straw to be used as fodder. The lack of irrigation infrastructure in most of the provinces leads to almost complete failure of the crop cultivated during dry seasons. Due to the undulating topography of the province, local farmers have trouble with mechanized land preparation, sowing and irrigation.

OBJECTIVE

The objective of this study is to discuss current conditions of agricultural sectors and constraints of agriculture in Paktya Province, which is located in southern parts of Afghanistan.

Table 1 General topography of Paktya Province

Flat	Semi flat	Mountainous	Semi mountainous	Not reported	Total
32.3%	1.9%	52.0%	13.1%	0.7%	100%

METHODOLOGY

In order to identify the current agricultural conditions and constrains, in Paktya Province of Afghanistan, a survey was done in Dawlatzai Village of Paktya Province. The village is located in the center of Paktya province and agriculture is the main economic activity in the village. Compared to other parts of the districts, it is safer and provides ample environment to conduct the research. A total of 34 farmers were randomly selected across the entire study area and interviewed in the survey. The questions in the questionnaire sheet were on basic information of household, farmland, crop cultivation, water resource, topography, fertilizer application, agricultural chemicals, soil degradation and agricultural extension services as shown in Table 2.

Table 2 Questions in the questionnaire sheet

Category	Related question	Details
Basic information of household	- Farmer's information	Name, Age, Gender, Number of family members, and Address
Farmland	- Cultivated area	Size (sq.meter,m ²)
Crop cultivated	- Kind of crops	Wheat, maize, barely, beans and vegetable
Water resource	- Source of irrigation water	Tube well, river and Karez
Topography	- Nature of terrain	Flat, semi flat, hilly and mountainous
Fertilization	- Type of fertilizers used	Urea, DAP (Diamonium Phosphate), farm yard manure, compost manure and ash
Agricultural chemicals	- Type of chemical used	Insecticide, herbicides, fungicides etc.
Soil degradation	- Soil erosion effect - Effect soil erosion - Soil conservation measure	Damage level, Nutrient loss and water pollution, Agronomic and physical measures
Agricultural extension service	- Extension service provision	Awareness of agricultural extension service

Each farmer was requested to fill one form. All forms were filled after all columns were understood by respondents. The data recorded for various parameters were subjected to statistical analysis. Critical Difference (CD) at 1% or 5% level of probability was computed to compare the statistical significance of different parameters.

RESULTS AND DISCUSSION

Soil Degradation

As shown in Table 2, soil degradation was a key challenge for farmers of Paktya Province. Environmental stress by the province’s people have drastically altered the landscape and caused widespread environmental destruction. Since the people lack adequate financial capability to purchase fuel, they mostly cut trees, uproot shrubs and collect animal dung as sources of fuel. This results in extensive soil erosion by both water and wind. Currently, only 6% of the 15% of land in Afghanistan is arable. Due to 3 decades of long civil war, large number of Afghan citizens migrated to neighboring countries. Therefore, in case if all the refugees were to return, problems of land ownership and adequacy of available land are inevitable. Natural forests have been severely degraded, vast areas are subjected to soil erosion due to the natural topography and the arid climate. Losses of vegetation and soil humus have created ever more arid conditions (Saba, 2009). Based on the questionnaire survey, 32.4% of responded farmers answered soil erosion happens very severely and 50.0% answered it happens severely as shown in Fig. 4. It means that more than 80% of farmers require the proper conservation strategies for holding soil moisture and fertility. According to the report of Afghanistan Environmental Protection Agency (2008), more than 80% of the whole land of Afghanistan could be subject to soil degradation with soil erosion, declining soil fertility, salinization, falling groundwater table, and de-vegetation.

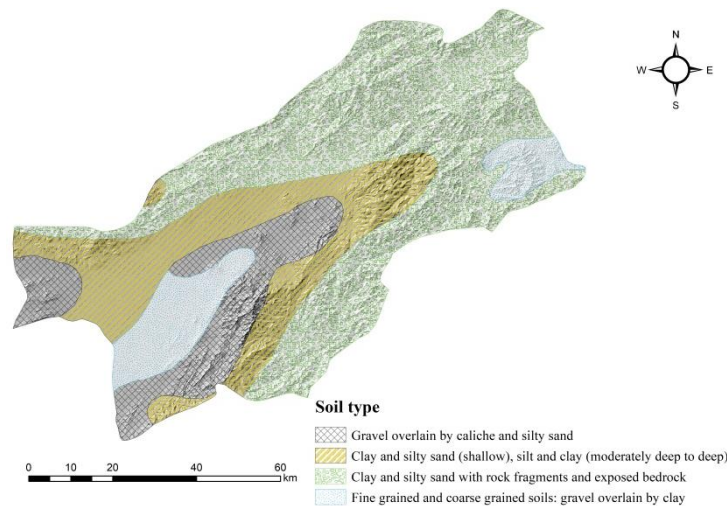


Fig. 3 Soil region map of Paktya Province (USDA-SCS, 2001)

According to the Global Assessment of Soil Degradation (GLASOD), about 16% of Afghanistan’s land is severely affected due to anthropogenic activities, whereas the country’s vulnerability to desertification is one of the highest in the world (3/4 of Afghanistan is vulnerable to desertification). The geological, topographical and meteorological features of Afghanistan naturally increase the country’s susceptibility to the processes of soil erosion, furthermore human activities significantly intensify them through farming on steep slopes, deforestation and de-vegetation of lands,

as well as unsustainable use of shrub and grasslands. Some degradation is too severe to recovery without human intervention. One of the most threatening impacts arising from loss of soil and vegetation is desertification and increasing floods. Paktya Province is in a mountainous region located at an elevation of between 1,500 to 2,300 m above mean sea level with the seasons of warm/dry summers and cold/chilling winter. The average annual rainfall is below 400 mm. The changes in monthly amounts of precipitation and average air temperature in Paktya is indicated in Fig. 5. Precipitation occurs mostly between the months of January to April. From June to October period Paktya Province receive hardly any rainfall.

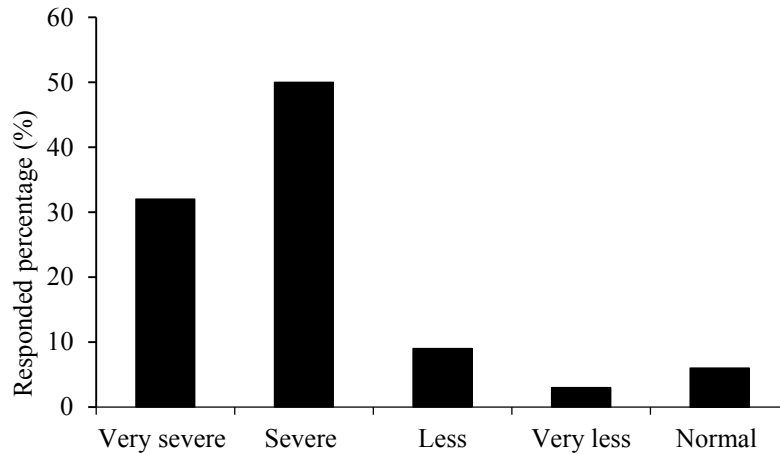


Fig. 4 Damage level of soil erosion in Dawlatzai Village of Paktya Province

As a result, water shortages frequently occur in the latter part of the cultivating season in August up-to harvest time in October, causing major difficulties in crop cultivation. Erosion causes a serious problem affecting the productivity of agricultural lands (Luis et al., 2010). The lack of information on the factors influencing erosion in the dry regions hampers the formation of proper soil conservation plans. Rainfall in this region is irregular and varies spatially and temporally. Short but intensive thunderstorms of highly erosive rainfall usually take place early in the rainy season in March and at the end of season in June. Although rainfall amounts are not considered high, the problems of soil erosion are severe due to high intensity rainfall on steep slopes with sparse or absent vegetation covered in the arid areas.



Fig. 5 Soil degradation observed in Dawlatzai Village of Paktya Province

Water Deficiency and Drought

Paktya is one of the mountainous provinces; it is divided into different valleys and regions. The water of river resource is from Spin Ghar Mountains, which runs from high latitude to eastern part to Karma Agency region and the mountains are the main source of irrigation water for Paktya. The quantity of water is related to rainfall and snow accumulated in the mountains. Most of the rivers are impermanent with increased water levels from February to April and usually dry from June to October as shown in Fig. 6. Zarmal, Patan and Arub are the main rivers flowing through the province. Springs, Karezs and tub wells are also used as water sources. Unfortunately, during the last three decades war, many Karezs and springs have been destroyed and majority of farmers are now digging the tub wells to get the water needed as shown in Fig. 7. Fuel is required to run these tube wells, but the higher price of fuel has caused another acute problem to the farmers of the province. Accordingly, majority of agricultural lands are rain-fed with no alternative methods of artificial irrigation.

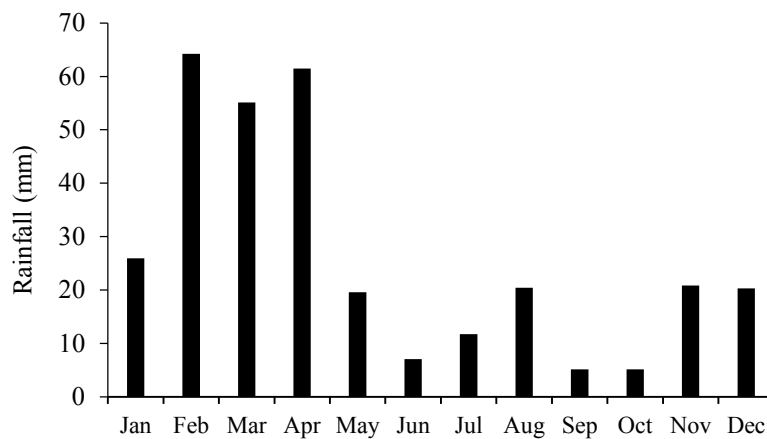


Fig. 6 Monthly precipitation in Paktya Province



Fig. 7 Water problems in Dawlatzai Village of Paktya Province

About 88% of farmers reported lack of irrigation is a main problem that they are facing as shown in Fig. 8. More than 85% of the land needs artificial irrigation. This has proved as one of the noticeable

factors that are considerably reducing the agricultural productivity. According to the UNEP (2003) Post-Conflict Environment Assessment Report on Afghanistan, the amounts of water used are less than one-third of total water potential at 75,000 million m³. Due to three decades political unrest and civil war, Afghanistan faces many different problems; water scarcity, damaged water infrastructure systems (Habib, 2014).

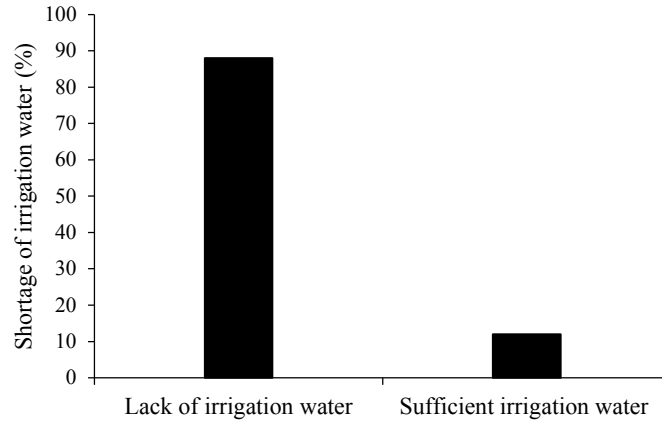


Fig. 8 Shortage of irrigation water

Agricultural Extension Services

Agricultural extension is one of the powerful forces that are responsible for the growth of crops by transferring latest and improved technologies to the farmers and ultimately strengthens the national economy (Sadaf, et al., 2005). Paktya Province has fourteen districts. Unfortunately just one extension worker has been appointed for six districts while the other 8 districts have none. It is impossible for a single person to reach the huge number of farmers and to solve their problems. According to the questionnaire survey, 64.2% of the farmers did not know about the active extension worker. As a result, the farmers lack the modern technical knowledge and still the old age traditional farming is being practiced, which is in turn hampering the agriculture production and ultimately the life style of people.

Quality of Agricultural Materials

Quality seed is an important asset for quality of production. It affects germination as well as the overall vigor of the plants, especially for the case of wheat (Barnard and Calitz, 2011). The Department of Agriculture, Irrigation and Livestock is responsible for seed distribution. But, due to the limited availability of certified seed and misguidance by many local seed distributors, farmers are forced to use the low quality uncertified seeds. More than 70% of the farmers were found not to have access to quality seeds. Utilization of poor quality seeds is one of the major problems in agriculture which is responsible for low crop productivity (DAIL, 2014).

Although Afghanistan Government has claimed that the pesticide contamination and requested to decrease its usage, but still there is continuous use of low quality insecticides. Poor quality insecticides affect natural environment and also induce some of the serious health issues due to their prolonged residual effects (Jabbar and Mallick, 1994). Some private agricultural companies and agro-clinics are importing the low quality insecticide and pesticide from Pakistan, Iran and China (DAIL, 2014). About 31.6% of the farmers are using the pesticides that are not even recommended for application. Thus, Afghan Government has been unable to completely ban or control such ill practices.

CONCLUSION

Paktya Province is based on the agricultural economy, but the condition of the farmers is severe. According to the topographical and climate conditions, modern farming methods employing artificial irrigation are indispensable. If some alternative sources of irrigation or modern methods of irrigation are popularized among local farmers, the condition of agriculture would be largely improved. The main problems that Paktya Province is facing today are those of soil degradation, deforestation, lack of irrigation water, poor extension services and lack of agricultural inputs. All of these, in turn, contribute to the declining agricultural production. Based on the survey conducted in the study area, 32.4% of the farmers responded that soil erosion happens very severely and 50.0% answered soil erosion happens severely. It means that more than 80% of farmers require proper conservation strategies for holding soil fertility. In addition, 88% of farmers reported lack of irrigation water and that more than 85% of arable land needs artificial irrigation system.

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