Competitiveness and Comparative Advantage of Wheat Production and Effects of Policy in Nangarhar Province. The case of District Dehbala

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DEDICATION

I Dedicate This Thesis To My Father

ABSTRACT

This study was carried out to find the competitiveness, comparative advantage of wheat production and policy effects in two selected villages of district Dehbala, Nangarhar Province, Afghanistan. This research uses mostly primary data of 2010 harvesting year. The primary data was supported by secondary data about prices of inputs and outputs market, CIF prices, and macroeconomic variables which were obtained from different national and international secondary sources. The data was analyzed using the Policy Analysis Matrix (PAM).The general characteristics of sampled respondents showed that that the average age of the sample farmers in the two villages was 41 years. In the two villages, a maximum of 48 % sampled farmer's falls in the age group of 31-40 years. The literacy rate among the sampled respondents in the study area was much lower. The average farm budget of wheat crop shows that the cost of wheat production per acre includes 8 percent of the total per acre cost of land preparation, 5 percent of the total per acre cost of seed and sowing, 2 percent of the total per acre cost of irrigation, 6 percent of the total per acre cost of intercultural practices, 23 percent of the total per acre cost of manures and fertilizers, 27 percent of the total per acre cost of harvesting and threshing, 11 percent of the total per acre cost of land, and 17 percent of the total per acre cost of marketing and transportation in district Dehbala respectively. Furthermore, the average wheat yield of 1680 kg per acre was estimated for average farm and the wheat price of one kg of wheat at the farm gate is Rs.20 while the price of one kg of wheat in the wholesale market of Jalalabad was Rs. 26. Prices for inputs were collected from the local market existed during the same harvesting year and output was based on wholesale market prices of 2001-10. The import parity prices were found out by the addition of the operating on processing and shipment of the Producer from Karachi sea port to Jalalabad (Afghanistan is landlocked country) with the CIF prices. The extent of comparative advantage and policy distortions of wheat production were estimated from different standard measures of comparative advantage i.e., Domestic Resource Cost (DRC) and Social Benefit-Cost Ratios (SBC) and indicators of policy incentives i.e., Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC), Producer Subsidy Equivalent (PSE) and Subsidy Ratio to Producer (SRP). In the analysis, it was cleared that the DRC ratio is more than one (1) for wheat for import substitution which gives information that the wheat farmers has no comparative advantage for wheat production in the study area and the result of disadvantage was also proved by SBC ratios. The NPC for import substitution for wheat is less than one which suggests that the wheat farmers have incentives to expand production and this is due to either of market failure or government intervention. Similarly, the EPC shows that the inputs and outputs of wheat are subsidized for import substitution. This implies that the policies of the government are not constant with the comparative advantage of wheat production. This study recommends Government of Afghanistan should make an effort to decrease the price of tradable inputs so that it will decrease on one side the cost of production and on the other side should increase average yield, so more vibrant support is necessary for the competitiveness and sustainability. The government should subsidize the inputs in the short term and start of making of agri-industries for input production in the long run in order to stabilize the prices and decrease the cost of production. Afghanistan doesn't require national self-sufficiency in wheat and should import the wheat when it has access to international markets.

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ABBREVIATIONS AND NOMENCLATURES

The following abbreviations and nomenclatures were used in this thesis.

Abbreviations	Nomenclatures
CSO	Central Statistic Organization
CIF	Cost Insurance Freight
FOB	Free on Board
GoA	Government of Afghanistan
Ha	Hectare
Kg	Kilogram
MT	Metric Ton
MD	Man Days
No	Number
US$	United States dollars
Rs	Rupees
%	Percentage

Definitions

Strategies
The sets of policy instruments that government officials can use to achieve their objectives.

Policies
Policies are government actions intended to change behavior of producers and consumers. The instruments that governments can use to change economic outcomes.

Constraints
Constraints are the economic realities that limit what can be accomplished.

Objectives
Objectives are the desired goals of economic policy as defined by policy makers.

Efficiency
Maximization of income from available resources. Efficiency is achieved when the allocation of resources produces the maximum amount of income and the allocation of goods and services brings highest consumer satisfaction.

Analysis
It consists of the evaluation of government decisions to change economic behavior.

Policy Analysis Matrix
A tool for assessing comparative advantage and to find efficiency and competitiveness. The central purpose of PAM analysis is to measure the impact of government policy on the private profitability of agricultural systems and on the efficiency of resource use. The first task for the development of the PAM is to select systems that are closely related to the policy issues of interest. In this identification process, decisions are made about farm production, movement of the commodity from the farm to the processor, processing, and transport to a wholesale market. One issue is whether agricultural systems are competitive under existing technologies and prices – that is, whether farmers, traders, and processors earn profits facing actual market prices.

Private profitability
A measure of the competitiveness of the system at actual market prices.

Social profitability
Measures efficiency (or comparative advantage) in efficiency prices. the result if products produced and inputs used are valued in efficiency prices (social opportunity costs).

Comparative advantage
In terms of international trade, comparative advantage refers to a comparative cost advantage in producing commodities and explains observed trade pattern according to country differences in resource endowments, investment patterns, technology, human capital, managerial expertise, and infrastructure and government policies.

Competitiveness
It is often perceived as the combination of comparative advantage and existing market distortions. The term competitiveness encompasses not only relative prices and the ability to market but also quality differences, production and distribution costs, and production and distribution efficiency.

Net transfer effect
Arising form the total impact of all divergences.

A distorting policy
It is a government intervention that forces a market price to diverge from its efficient valuation. Taxes/subsidies, trade restrictions, or price regulations could lead to this result. Distorting policies usually are enacted to further non-efficiency objectives (equity or security).

A market failure
It occurs if a market fails to provide a competitive outcome and an efficient price. Common types of market failures are monopolies, externalities, and factor market imperfections.

Nominal Protection Coefficient
The ratio formed to measure tradable input transfers is called the Nominal Protection Coefficient on Inputs (NPC), a term also taken from the literature on international trade. This ratio shows how much domestic prices of tradable inputs differ from their social prices.

Effective Protection Coefficient
A second ratio, the Effective Protection Coefficient (EPC), can be calculated directly using entries from the PAM matrix. This ratio compares valued added in domestic prices with value added in world prices.

The subsidy ratio to producers
It is a single measure of all transfer effects. The SRP is the output tariff equivalent if the net effect of all policy transfers were carried out solely through a tariff on output. This ratio is a comparison of the net transfer to the value of output in world prices.

The social benefit-cost ratio
SBCR is equal to the ratio of social revenues to social costs.

Nontradable commodity
If the country cannot import part of its consumption or export part of its supply of a commodity, the commodity is termed a nontradable commodity. Because no international market exists for it to purchase imports or sell exports, the price of a nontradable commodity is set where domestic demand and supply are equal.

Parity price
Parity means equal or equivalent. Parity prices are used to compare prices of a commodity in two different locations, when the two locations are in different countries.

Import parity price (IPP)
The value of a unit of product bought from a foreign country, valued at a geographic location of interest in the importing country.

Export parity price (XPP)
The value of a product sold at a specific location in a foreign country, but valued from a specific location in the exporting country.

Import Substitution
To substitute imported commodity with locally produced commodity to attain self-sufficiency.

Opportunity Cost
The next best alternative is called opportunity cost e.g. lost time, pleasure or any other benefit that provides utility.

Shadow price
The opportunity cost of an activity.

Tariff
A tariff is a tax placed on imported goods or Customs duties on imports are called tariffs.

Subsidy
Financial assistance, either through direct payments or through indirect means such as price cuts and favorable contracts, to a person or group in order to promote a public objective.

Farm budget
Representative of current average farming behavior

Premium
The percentage difference between Shadow Exchange Rate and Official Exchange Rate. A tax paid by exporters to importers. The financial objective of a premium or discount is to compensate for interest rate differences between currencies.

Shadow Exchange Rate
It is the weighted average of demand price of foreign exchange paid by importers and the supply price of foreign exchange received by exporters. It is the economic price of foreign currency.

Social price
How much output and income are foregone

Border price
The reference (border) price is the import (c.i.f.) or export (f.o.b.) price of a commodity used for calculating the market price support price gap, measured at the farm gate level. An implicit border price may be calculated as, for example, the unit value of imports or exports.

Social opportunity cost
The opportunity cost to the society of making a certain good or service, at the expense of using the factor of production for a different good or service.

Market price
It is a local (observed) price with in the market. It is the economic price for which a good or service is offered in the marketplace. The price at which a product can be sold.

Food Security
Food Security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life

CHAPTER 1
INTRODUCTION

1.1. Background

Afghanistan is an agricultural country of which 85 percent of population is involved in agriculture. It occupies 650,000 sq/km of mountainous territory in Central Asia and is entirely land locked, about 12% of the country's total land is arable, 3% is under forest cover, 46% is under permanent pastures, and the remaining 39% is mountainous. The population of Afghanistan was estimated 25.0 million and the annual growth rate was estimated 2.03 percent. The inflation rate was 4.9 percent. The export of goods was about US$ 545 million, the import of goods was US$ 3020 million and the trade balance was in deficit that US$ -2475 million. Wheat is the staple crop, accounting for about 83% of total cereal consumption which is grown under irrigated and rain fed conditions. Wheat harvest was estimated at 2.623 million tons in 2009. However, yield and production of wheat in Afghanistan are far below the world level wheat producing countries (CSO, 2009).

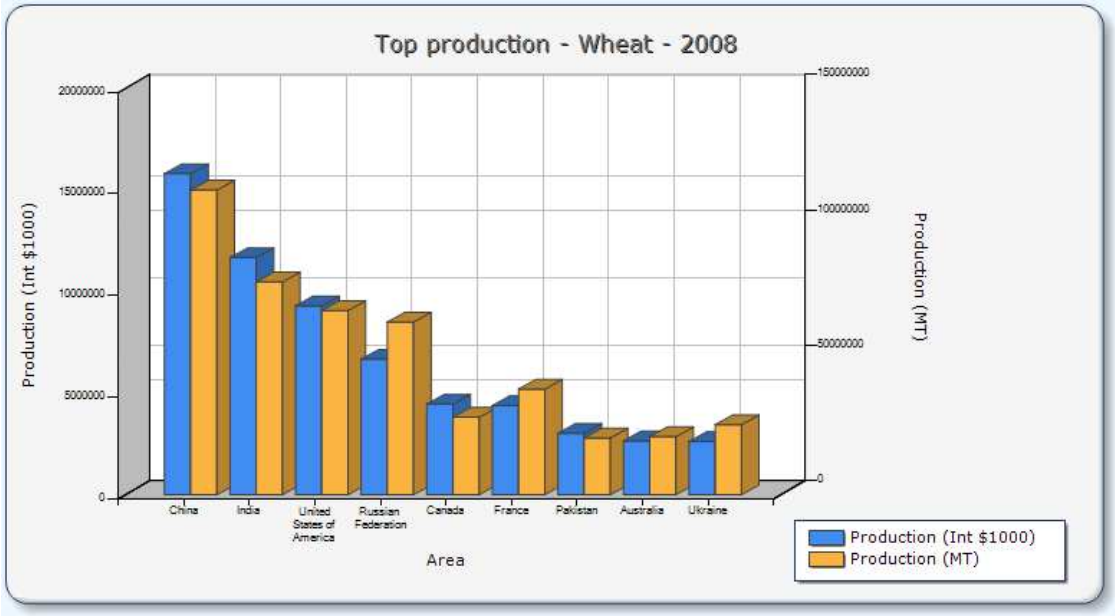
Wheat is grown in most parts of the world, from near-arctic to near-equatorial latitudes. It is unique among cereals since the total area under wheat cultivation world-wide is larger than for any other cereal and the amount of wheat traded internationally exceeds that of all other grains. Furthermore, the protein and caloric content of wheat is greater than in any other food crop. Most wheat is consumed in the form of baked goods, mainly bread. Hence, wheat grains must be milled to produce flour prior to consumption (FAO 1999).

Wheat is the staple food for most Afghans, comprising more than 70 percent of their diet. Low-quality rice is a poor, but sometimes necessary, substitute. Annual per capita wheat consumption is about 160 kg, one of the highest rates in wheat-consuming countries around the world. Almost all wheat is consumed as *naan*, the local unleavened bread. In 1978, Afghanistan was self-sufficient in food production for its own population of 14 million people, but nearly two decades of war damaged or destroyed irrigation canals and storage and market infrastructure, severely decreasing the productive capacity of the wheat sub-sector. Consecutive years of drought further constrained agricultural production (USAID, 2007).

Afghanistan is expected to have a national wheat deficit of approximately 700,000 tons in 2010. Shortfalls in national wheat production are typically covered in part by imports from Kazakhstan and Pakistan. Food security conditions are expected to remain stable or improve in surplus producing agricultural provinces in the north, northeast, and western parts of Afghanistan with the exception of Badakhshan and Farah provinces. This improvement is as result of gradual increase in wheat prices which promises better income for producers and a second consecutive above average harvest. However, Food security conditions are expected to deteriorate in the production-deficit provinces in southern, eastern, and central Afghanistan where localized poor harvests, recent flooding, and an increase in regional wheat prices as result of a below-average harvest in Kazakhstan and a Russian ban on wheat exports have all constrained food access and availability. One exception is Helmand province in the south, which typically produces a surplus (USAID, 2010).

All markets represent significant population centers and consumer markets. Kabul, the capital, supplies the central provinces and is a transit point between the north, south, east, and west. Jalalabad supplies the eastern part of the country and acts as a cross border market with Pakistan. Mazar-e-Sharif supplies Northern provinces and, in a good year, the southern provinces as well. Faizabad supplies the chronically food insecure northeast region. Maimana market supplies the drought-prone northwest region. Hirat supplies the west. Kandahar supplies the southwestern part of the country where drought, civil insecurity, and war often hinder market activity (USAID, 2010).

Graph 1.1 illustrates world main growing countries of wheat and their area under wheat cultivation, production, and yield.



Source: FAO (2008)

Graph 1.1 shows that China, India, U.S.A, Russia, Canada, France, Pakistan, Australia and Ukraine are the top countries in wheat production. China ranks first and India ranks second in production of wheat among the top countries of the world.

Table 1.1 shows that the area and production of wheat in Afghanistan have changed from 2000.00 thousand hectares and 2000.00 thousand tonnes in 1995-96 to 2139.00 thousand hectares and 2623 thousand tones in 2008-09 respectively.

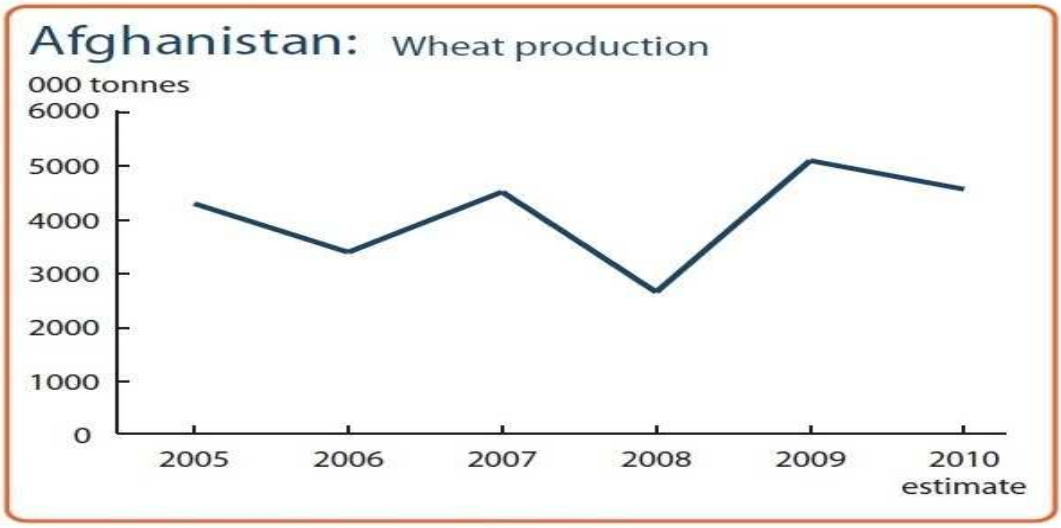
Table 1.1 Area, Production and Yield of Wheat in Afghanistan

Year	Area (000 ha)	Production (000 ton)	Yield (kg/ha)
1995-96	2000.00	2000.00	1030
1996-97	2050.00	2300.00	1998
2000-01	2029.00	1469.00	1510
2001-02	1779.00	1597.00	787
2002-03	1742.00	2686.00	717
2003-04	2320.00	3480.00	1500
2004-05	1888.00	2390.00	1266
2005-06	2342.00	4266.00	1822
2006-07	2444.00	3363.00	1376
2007-08	2466.00	4484.00	1818
2008-09	2139.00	2623.00	1226

Source: CSO (2009)

Figure 1.2 shows the relatively stable wheat prices reflect a record harvest of 5 million tonnes last year and an expected above average crop in 2010 (forecast at 4.5 million tonnes). The two consecutive bumper harvests coupled with high levels of imports in 2009/10 (July/June), is estimated to have resulted in large carry-over wheat stocks. Wheat production decreased in 2006 and 2008 because of drought but increased in 2007 to 2010. Afghanistan has a structural deficit on wheat but due to the favorable supply situation, import requirements in marketing year 2010/11 (July/June) are forecast to decline sharply. On the whole, following two successive bumper wheat harvests, large carry-over stocks, reduced wheat imports requirements in 2010/11 (July/June) and satisfactory export availabilities in Kazakhstan and Pakistan, the national wheat supply situation in Afghanistan is expected to remain satisfactory in marketing year 2010/11 July/June because The Afghan farmers have enjoyed bumper yields in 2010 and wheat harvest was above average (FAO, 2010).

Graph 1.2 illustrates Afghanistan wheat production



Source: (FAO, 2010)

Table 1.2 illustrates Afghanistan's main importing countries of wheat in quantity and value. As, the import of wheat of Afghanistan has increased to 458,882 ton which value 96,748,000 US$ from Pakistan compared to Kazakhstan to 34,765 ton which value 7,484,000 US$ in 2007. Conversely, the import of Afghanistan has decreased to 14,774 ton which value 2,730,000 from Pakistan compared to Kazakhstan to 316,106 ton which value 67,797,000 US$ in 2009.

Table 1.2 Quantity and Value of Afghanistan's main importing countries of wheat (2007-09)

S.No	Countries	Year	Quantity (000 ton)	Value (US$)	US$/ton
1	Pakistan	2007	458,882	96,748,000	210
		2008	160,009	47,420,000	296
		2009	14,774	2,730,000	184
2	Kazakhstan	2007	34,765	7,484,000	215
		2008	310,004	107,420,000	346
		2009	316,106	67,797,000	214

Source: International Trade Centre (2010)

Afghanistan has traditionally imported most of its wheat from Pakistan but in the past two years Kazakhstan has largely become the main source of imports (1 296 000 tonnes in 2008/09 and 1 654 800 tonnes in 2009/10 (FAO, 2010).

Policies are government's actions to make changes on public issues. One kind of government policy is the intervention on the agriculture sector. There are commonly three main objectives in this policy: efficiency (the allocation of resources to effect maximal national output), income distribution (the allocation of the benefits of agricultural production to preferred groups or regions), and food security (the short-run stability of food prices at levels affordable to consumers, reflecting the adequacy of food supplies, and the long-run guarantee of a adequate human nutrition). In the application, policy makers face trade off gains among the objectives. For example, improving the income distribution or food security might tolerate a small loss of efficiency. The policy makers form value judgments about the worth of different objectives for making trade off among them explicitly or implicitly (Monke & Pearson 1989).

The governments in some countries make some different policies to develop the economy and trade in global and regional markets. Some of them apply more tariff and non-tariff restrictions that are allocated to save the home industries and subsidize domestic agriculture to protect local producers. These policies affect the productivity of some sectors such as agriculture sector and liberate resources from less efficient uses and thus increase the total value of economic activity. Furthermore, the current free market economy promotes trade liberalization, non-intervention by government and removal of trade barriers, under the free trade regime increasing competition and competitiveness of different countries (Devadoss, 1992).

1.2. Significance of the study

In most developing countries, macroeconomic policies have a major impact on the profitability of agricultural systems and welfare of farmers. In the current strategy, agricultural policy is a critical element in determining the rate and pattern of economic growth. Afghanistan is one of the largest importers of wheat. The country tries to ensure the food security policy because of the risk and uncertainty to purchase the wheat in future while the necessary commodities are to be available during war or political boycott. Regarding the current world economy situation, the Ministry of Agriculture of Afghanistan is making efforts to increase area under wheat and other cash vegetables cultivation, total production and yield in all over the country, particularly in Nangarhar province due to good agro-climatic conditions. The natural resources, human resources and diverse climatic conditions of the country with efficient and consistent agricultural and macroeconomic policies can enhance the productivity and comparative advantage of Afghanistan agriculture in general and wheat production in particular. To cope with the current trend of trade liberalization and free market economies system, it is required for Afghanistan to know the competitiveness, comparative advantage and policy effects of Afghanistan agriculture and specially wheat. Therefore, this study is trying to estimate the competitiveness, comparative advantage and policy effects of wheat production. This research will use Policy Analysis Matrix (PAM). The central purpose of PAM analysis is to measure the impact of government policy on the private profitability of agricultural systems and on the efficiency of resource use. Many researchers have applied Policy Analysis Matrix (PAM) to study comparative advantage and competitiveness of agriculture (e.g. Nelson and Panggabean 1994; khan and Akhtar 2006). In the light of above discussion the study was carried out to determine the comparative advantage and competitiveness of wheat in district Dehbala of Nangarhar Province Afghanistan.

1.3. Problem Statement

Presently, Afghanistan is importing large quantities of wheat. Knowledge is lacking about production constraints of Afghan wheat growing and the reasons why it is not able to compete with imported grain are not well known.

1.4. Research objective

1. To investigate competitiveness, comparative advantage and effects of policy on wheat production in order to recommend government policies.

1.5. Research Questions

Main Research Question: What can be a comparative advantage of Afghanistan in growing wheat compared to countries in the region?

a) What are the production costs of Afghan wheat growers in relation to imported wheat?
b) How dependent are Afghan farmers on imported inputs?

CHAPTER 2
REVIEW OF LITERATURE

This chapter deals with the review of literature, which is relevant to the subject matter of the thesis. It helps us to avoid the repetition of work and the information about the problem can be taken from the research article or study on which research is being conducted.

2.1. Literature on Competitiveness, Comparative advantage and PAM

Chaudhry and Sahibzada (1994) investigated the debate on policy issues for increasing agricultural productivity in Pakistan and the misallocation of resources. It finds that resources are drawn away from commodities in which Pakistan has a strong comparative advantage (e.g. cotton) and towards commodities of which it is a relative inefficient producer (e.g. sugarcane). The article winds up the comparative advantage-based specialization are benefited to trading partners under free trade conditions. It is suggested that the governments to subsidize input and output and fair distribution of major inputs across various regions and farm producers.

Gill (1996) studied the competitiveness of chosen agricultural commodities. It shows only the agricultural of Punjab province because of its large export surplus. Sections consider: (1) the issue of globalization of agriculture and its likely context for developing countries like India and their trade of agricultural commodities; (2) the international competitiveness of agriculture in Punjab focusing on wheat and rice; and (3) the structure of global markets for primary commodities and problems of retaining gains of development for the primary producing developing countries.

Bagchi and Hossain (2000) examined the comparative advantage in rice production for India. The farm budgets were arranged for both economic and financial prices. The comparative advantage was initiated by the judgment of social profitability and domestic resource cost ratio including the value of rice and the resources mixed up in its cultivation at their opportunity cost. It is also recognized the factors that caused changes in the comparative advantage from 1975 to 1995 when India had adequate increase in rice production through technological progress, the results showed that adoption of high yielding variety, farm mechanization, increased use of fertilizers and chemicals led to increase in productivity. These all factors affected the competitiveness and comparative advantage of rice has improved.

Camara (2000) used the Policy Analysis Matrix (PAM) framework, the impact of agricultural policies, location and technologies, on the private and social profitability of cassava production and post-production processing in Cote dlvoire, Ghana and Nigeria. The results showed that cassava/maize systems had a competitive advantage over the competitors in Cote dlvoire. In addition, farmers operating at the market located near the port city benefited from a small implicit price support whereas farmers located far away from the port city were subject to a small implicit tax. The results showed that Ivorian and Ghanaian cassava/maize farmers benefited from growing improved variety and adopting mechanized processing methods.

Chunlai (2000) assessed the consistency of current pattern of regional grain. The study proved that the current pattern of China's regional grain flow was consistent with the regional comparative advantage in grain production, measured by the comparative advantage indicators of Domestic Resource Cost Coefficient (DRCC) and Net Social Profitability (NSP). However, the Efficiency Advantage Indices (EAI), measured by relative grain yield, and the Scale Advantage Indices (SAI), measured by relative grown sown area, was not statistically significant determinants of the observed pattern of regional grain flows in China. This implied that government intervention in grain production was still an obstacle for the Chinese farmers to optimize their grain production mix.

Fang et al. (2000) assessed the comparative advantage and protection of China's cotton production for five regions, using a modified Policy Analysis Matrix (PAM). They observed that Cotton was the most attractive crop in Xinjiang and Henan. It had obvious comparative advantage over its rival crops with the exception of rice in Jiangsu and Hubei and had no comparative advantage in Shandong. Yield decreases induced by bollworms and other diseases were the main negative factor for the poor comparative advantage of cotton production in the Yellow River valley.

FAO (2000) stated that an input price shows comparative advantage which leads to specialization in production. Specialization then commercialization which leads towards intensification in production which in turn leads to economies of scale in commodity production which reduced costs and resulted in some combination of reduced prices for consumers, increased returns to factors of production and increased prices. It is said that the comparative advantage in agricultural commodities is identified by climate and soil type, but much of it is the result of decades of investment in production methods, research into seed varieties and development of appropriate infrastructure.

Kikuchi et al. (2000) examined the changes in comparative advantage of rice production in Sri-Lanka during the last thirty years, by estimating the DRC. It was found that rice production became highly socially advantageous within one decade after Green Revolution, relative to rice imports due to the Irrigation infrastructure; in mid 1980 country attained self sufficiency in rice production and comparative advantage was eroded. The major factor responsible for lowering down the comparative advantage of rice production was escalating wage rate.

Shahabuddin et al. (2000) studied the comparative advantage of rice using two indicators: net economic profitability and domestic resources cost ratio. It was found that Bangladesh has a comparative e advantage in rice production except for the upland aus crop and the deep water aman rice. So, diversification is in favour for both uplands and extreme lowlands. Although there has been a substantial decline in the real rice price in the domestic and world market, the comparative advantage has improved over the last two decades.

Sukume et al. (2000) estimated the competitiveness of different geographic areas and farming system in producing a variety of agriculture commodities by utilizing the domestic resource costs ratio approach. Policy differences and their effects in Zimbabwe economy were showed by using the PAM. Results showed that compared to the other sectors higher number of crops are economically viable in each zone in small-scale commodity sector. The most efficient crop was groundnut followed by sunflower and cotton in all zones.

Vink (2000) used the DRC measure that commercial farmers had a comparative advantage in the world market in the production of commodities such as chilies, soybeans and Valenica. Wheat farmers in the Western Cape and sugar farmers in KwaZulu-Natal had no comparative advantage in the production of these commodities. The intervention included tariffs on tradable inputs such as pesticides, herbicides, other chemicals, packing material, packing equipment and mechanical parts, and taxation on diesel.

Zhang et al. (2000) studied the China's comparative advantage in the production of agricultural products for the period 1992-95 was estimated using domestic resource cost. Results show that China has lost its comparative advantage in food grains and many important crops but maintained comparative advantage in other products, such as vegetables, fruits, animal products, and some industrial crops. Changes in domestic factor and goods prices were responsible for the estimated changes in comparative advantage in agricultural as well as non-agricultural products during the period studied.

Chen (2001) examined the Taiwanese agriculture; agriculture policy and trade. These are for measuring the comparative advantage of chosen crops is initiated and the comparative advantage of eight selected agricultural products produced in Taiwan is appraised (rice, maize, wheat, soybeans, sugar, bananas, citrus fruits, flowers and pigs). Issues and strategies for raising agricultural competitiveness are considered.

Lu (2001) suggested that opening markets and reducing protection by joining the world Trade Organization (WTO) would have multi layered effects on Chinese agriculture. In particular, china's accession to the WTO will have an effect on production growth, at least in the short term, to improve the competitiveness of Chinese agricultural; the government should remove quota system and the farm structure through further land reforms.

Bogale et. Al. (2002) examined the competitiveness of smallholder farmers in food crop production. Policy Analysis Matrix (PAM) indicators, such as NPC, EPC and DRC were employed to analyze the incentives generated under a set of existing agricultural policy and competitiveness of smallholder farmer for six major crop-district categories, i.e., sorghum and maize in Alemaya; wheat and barley in Hitosa; and teff (Eragrostis tef) and sorghum in Merhabete. The PAM indicators showed that domestic production of food crops enjoyed comparative advantage even in regions where productivity was highly constrained by land degradation and also face some policy disincentives.

Huang (2002) analyzed the economic competitiveness of sweet potato in china using a policy analysis matrix. It showed that policy distortions had penalized sweet potato relative to maize. The sweet potato can be substituted for maize in pig feed will depend on the direction of future policies. It was finalized that increased investment in sweet potato research and extension and removal of current policy distortions are steps for realizing sweet potato's potential in China's agricultural economy.

Peter (2003) explored the interactions between comparative, competitive and absolute advantage in a two-country model of oligopoly in general equilibrium. Comparative advantage always determines affect resource of trade, but both Comparative and absolute advantage affect resources allocation, trade patterns and trade volumes. Competitive advantage in the sense of more home firms drives foreign firms out of marginal sectors but also makes some marginal home sectors uncompetitive. Absolute advantage in the sense of a uniform fall in home costs tends to raise home output in all sectors but also leads both countries to specialize less in accordance with comparative advantage.

Akhtar and Khan (2006) used Policy Analysis Matrix (PAM) to find competitiveness and policy effects of potato production in the six villages of district Gilgit. The PAM analysis proved that the Domestic Resource Cost (DRC) values are less than one (0.27 – 0.28) for import substitution which shows the comparative advantage to produce potato as import substitute while its values higher than one (1.02-1.11) for export promotion proves no advantage to produce potato for export. The Social Benefit Cost (SBC) ratios for import substitution regime are greater than one (2.79-3.00) and its values less than one (0.93-0.99) for export promotion regime also supports the comparative advantage in import substitution and no advantage in export promotion .The values of Nominal Protection Coefficient (NPC) for import substitution regime in all the three agro-ecological zones are less than one (0.54-0.59) which shows that farmers getting less of the world prices. The NPC value for export promotion is more than one (1.61-1.78) which shows that farmers gets more than world price. Also, the values of Effective Protection Coefficient (EPC) mean that for import substitution regime, input and output had taxes and for export promotion regime, the prices are protected and incentives to the farmers.

Zhong et al. (2007) carried out study on comparative advantage, food security, development of the industry, and farmer's income. This was carried out to have an analysis for resource mobility, which is an important assumption in free trade theory. By doing the mobility of different production resources in Chinese agriculture, namely natural resources, capital inputs, human resources and institutional arrangements, found that for most production resources in Chinese agriculture, mobility is low. The results have significant policy implications in two respects: first, protective measures in the transitional period for certain crops in certain areas in China are legitimate and necessary to ensure social stability; and second, policy instruments to improve resource mobility in Chinese agricultural should be explored and implemented to realize more trade benefit in the future.

2.2. Summary of Review of Literature

The Policy Analysis Matrix (PAM) type models were used by applied economists to detect the competitiveness, comparative advantage from the complex real world interactions of farm level activities, agricultural and macro economic policies and international market prices. These models provide realistic measure of competitiveness, comparative advantage and level of safeguard / government intervention for a given commodity.

CHAPTER 3
MATERIALS AND METHODS

This chapter deals with the procedure for the analysis of the research issue under investigation. Therefore, it deals with the research site, the study procedures, sampling design and data collection tools and data analysis. The following research methodology was adopted.

3.1. Selection of the Study Area

The study was conducted in the Dehbala District of Nangarhar Province Afghanistan. The district was selected for the following reasons:

1. Two villages were purposively selected for wheat from the Dehbala district. These villages were selected due to the fact that wheat is the major crop of this area and the villages were easily accessible.
2. Personally, I belong to this district and these villages were also selected due to security reasons because insurgency is increasing day by day in Afghanistan. I feel no threat to conduct survey in my own district and having no photos during the survey because of the restrictive and sensitive society in rural areas of Afghanistan.
3. Being a supervisor in this survey then I have four additional staff as assistants who also helped me during survey and they belong to these villages. Among these two are working with NGOs and two are studying in the Agricultural Faculty of Nangarhar University. So, they are used with local conditions and to this kind of research because all of them having agriculture qualification.

3.2. Data Sources

The research has a quantitative and qualitative approach that was based on empirical data and relevant literature. The empirical data was collected through a survey while the literature was collected through a desk study. The primary data was collected through survey while the secondary data was collected through different literature searches and confirm through talking with people, personal interviews, telephone surveys, and mail communication.

3.3. Sampling Design and Data Collection

Samples of fifty four wheat farmers from Dehbala district were taken in such a manner to obtain maximum and reliable information on all farmers in the research area. Samples of fifty four wheat farmers from the two villages of Dehbala district were purposively selected. The decision about the sample size of the target population that of wheat farmers was based on factors such as: time available, budget and necessary degree of precision. From the District Agriculture office of the district it was found that there are 270 farmers respectively. Therefore probability sampling method was used that in probability samples, each member of the population has a known non-zero probability of being selected. Probability method like simple random sampling was used to select 54 sampled farmers out of 270 wheat farmers at the rate of 20 percent.

Data was collected by using a structured questionnaire. The questionnaires were filled through person to person (face to face) interview. Pre-tested of the questionnaires were done with few interviews to save both time and effort. Pretesting during survey helped me in determining the

time it takes to administer, process and also helped in clearing some confusion and skipped some questions which were not relevant to the situation and not useful but not removed from the questionnaire that time because I have already printed the questionnaire in Jalalabad city and no printing facilities were available in the district to develop the final questionnaire.

Moreover, a literature search involves reviewing all readily available materials. These include district profiles, ministry of Agriculture information, Afghanistan Statistical Yearbook 2008-09, relevant trade publications, newspapers, magazines, annual report, on-line data bases and any other published materials including national and international sources. It is inexpensive method of gathering information.

Simple random sampling was used to select fifty four sampled farmers out of 270 for wheat at the rate of 20 percent in two selected villages for wheat in Dehbala district using Proportional Sampling Allocation Technique (PSAT) from the above selected villages. This sampling technique was carried out according to the book of Chaudhry, 1997.

Proportional Sampling Allocation Technique for Wheat: $n_i = n * \frac{Ni}{N}$

Where: n_i = Where n_i is the number of sampled farmers in each village

i = No of villages in the study area

n = Total sample size

N_i = Total no of farmers in i th villages

N = Total number of farmers in all villages

n 1 = Number of farmers in Yaghiband village

n 2 = Number of farmers in Shakhmedan village

n 1 = 54* 140/270 = 28 (Approx)

n 2 = 54* 130/270 = 26 (Approx)

The number of sampled farmers in each village selected for wheat is given below:

Table 3.1 Numbers and Sample Size of Wheat Farmers

Villages	No of Farmers	Sample size
Yaghiband	140	28
Shakhmedan	130	26

Source: District Agriculture office, Dehbala

Data was collected, outliers were removed, consistency was checked within the individual farmer's information also cross checked with available secondary data production and marketing data of wheat for accuracy, the sampled farmers were selected with the help of random sampling technique.

3.4. Analytical Framework: The Policy Analysis Matrix (PAM)

The Policy Analysis Matrix (PAM) developed by Monke and Pearson (1989) for measuring, input use efficiency in production, comparative advantage and the government involvements. Many researchers have applied Policy Analysis Matrix (PAM) to study comparative advantage and competitiveness of agriculture (e.g. Nelson and Panggabean 1994; khan and Akhtar 2006). The Policy Analysis Matrix used to determine competitiveness, comparative advantage and policy effects on wheat production in Dehbala district of Nangarhar Province compare with wheat production of other countries. The PAM consists of the profitability identity and the divergences identity. Competitiveness is measured by private profitability in PAM at market prices while comparative advantage is measured by the opportunity costs of the crop.

Table 3.2 The Structure of Policy Analysis Matrix

Budget Items	**Market Prices**	**Opportunity Costs**	**Effects of policy transfer (Divergences)**
Revenue	A	F	K
Labor costs	B	G	L
Capital costs	C	H	M
Tradable input costs	D	I	N
Profits	E	J	O

Source: Monke and Pearson (1989).

Net Private Profitability: E = A – (B+C+D)

Net Social Profitability: J = F- (G+H+I)

Output Transfers, K = (A - F)
Labor Market Distortions L, = (B - G)
Capital Market Distortions M, = (C - H)
Other inputs Transfers N, = (D - I)
Total Policy Effects O, = (E - J) = (K - L - M - N) = NPP- NSP

3.3.2.1 Private Profitability

The data entered in the first column of the table 3.2 provide a measure of private profitability (E), defined as the difference between observed revenue (A) and costs (B+C+D) valued at market prices (the observed market prices). The calculation of private profitability measures the competitiveness of the agricultural system, given current technologies, prices for inputs and outputs and policy transfers.

3.3.2.2 Social Profitability

The second column of the table 3.2 calculates the social profitability that reflects social opportunity costs. It is defined as the difference between revenue and costs of domestic factors and tradable inputs priced at social opportunity cost (social values). Social profitability measure efficiency and comparative advantage of the agricultural systems.

A country has a comparative advantage in producing a commodity when NSP > 0 and it uses its resources efficiently at their shadow prices. Conversely, if the NSP is negative NSP < 0 then the production of the commodity will not be socially profitable, hence the country does not have comparative advantage.

3.3.2.3 Policy Effects / Divergences

The last column of the table 3.2 estimates the difference between the first and second column. It is concerned with the difference between private and social valuation of revenue, costs and profit. For each entry in the matrix, any divergence between the observed private (actual market) price and the estimated social price must be explained by the effects of policy or the existence of market failures. Distorting policies leads to an inefficient use of resources that enhance the divergence. The efficient polices offsetting the effects of market failures generate greater income and thus correct divergence by reducing difference between private and social valuations.

Using the elements in Table 3.2, the PAM framework has the flexibility to generate more conventional measures of comparative advantage and indicators of policy effects that are independent of measurement units and scale of operation to facilitate comparisons among different commodities (Monke and Pearson, 1989) which are as follows:

1. *Domestic Resource Costs Ratio (DRC) = (G + H)/(F - I)*
2. *Social Benefit-Cost Ratio (SCB) = F/(G + H + I)*
3. *Nominal Protection Coefficient (NPC) = A/F*
4. *Effective Protection Coefficient (EPC) = (A - D)/ (F - I)*
5. *Percentage Producer Subsidy Equivalent (PSE) = O/A*
6. *Subsidy Ratio to Producers (SRP) =O/F*

3.3.2.4 Domestic Resource Cost Ratio (DRC)

The DRC ratio measures an activity's contribution to national income and thus comparative advantage by quantifying the opportunity costs of domestic resources used in per unit of tradable value added of that activity, both measured at social prices in local currency. In the PAM context, DRC = (G + H)/(F - I). In this ratio, G and H are costs of (non tradable) domestic factors (i.e., land, labor and capital) while F is revenue and I are the costs of the tradable inputs of the activity. The difference (F-I) is tradable value added of the activity when everything is valued at social opportunity cost.

If DRC is less than unity then a country has a comparative advantage in an activity and contributes to national welfare and If DRC is greater than unity then it suggests the inefficiency of a country in producing that particular commodity.

3.3.2.5 Social Benefit-Cost Ratio (SBC)

The Social Benefit-Cost ratio is another measure of relative and comparative advantage efficiency. In the PAM context, SCB = F/(G + H + I), where F is the revenue both valued at social prices and G, H, I are the costs of tradable and non tradable inputs**.**

If SCB is greater than unity then a country is an efficient producer of a commodity while SCB less than one suggest that production of that commodity is not profitable for the country.

3.3.2.6 Nominal Protection Coefficient (NPC)

Indicators of policy analysis can be generated directly from the elements in PAM. The simplest indicator of policy analysis is the Nominal Protection Coefficient (NPC), the ratio of domestic to border prices for given product. Using entries in Table 3.2, the ratio, NPC = A/F, is formulated very easily, where A is domestic price and F is border price of a given commodity**.** NPC +ve but

less than unity means that its marginal social benefits exceed costs and there is +ve incentives to expand the production. As an indicator of policy effects, an NPC lower than one means that production of a particular commodity is taxed either because of market failure or government intervention. Conversely, an NPC greater than unity suggests inefficiency of a country in producing that particular commodity and that the price is heavily affected by government policies or other factors. NPC = 1, indicates neutral structure of protection where the domestic price is equal to the border price.

3.3.2.7 Effective Protection Coefficient (EPC)

The EPC can be defined as the ratio of distorted tradable valued added at market prices to its undistorted value priced at border prices. Using PAM elements, EPC = (A - D)/ (F - I). The entries A and D are revenue and tradable inputs costs valued at market prices while the elements F and I are revenue and tradable inputs costs valued at social prices. Thus the ratio of the difference between A and D (distorted tradable value added) and F and I (undistorted tradable value added) is EPC. Using the border price as the reference price, an EPC greater than unity implies price protection and positive incentives to the domestic producer of that commodity while the opposite is true when the EPC is positive but less than unity.

3.3.2.8 Producer Subsidy Equivalent (PSE)

The Producers Subsidy equivalent (PSE) and Subsidy Ratio to Producer (SRP) analysis is used to gauge the government intervention for certain crop. The percentage PSE is defined as the ratio of total PSE to revenue valued at market prices. The ratio, PSE = O/ A, is derived very easily from the matrix, where O is total policy transfers and A is revenue at market price Similarly the SRP uses the same information as percentage PSE, but it has an advantage of being equivalent measure like NPC and EPC. The SRP can be obtained directly from PAM Table 3.2 by picking up the relevant elements of the matrix. In the PAM notation, SRP can be written as SRP=O/F, where O is net policy transfers to producers and F is revenue from the activity valued at social opportunity costs prices. The negative values of PSEs and SRPs indicate overall transfer from producer to consumer and tax payers while the positive values of PSEs and SRPs indicate the overall transfer from consumer to producer.

3.5. Limitations of the Study

1. This study did not cover the entire district of Dehbala because with time and financial constraints, organization and conduct of a study covering the entire region is too ambitious for a single research worker. The study was restricted to two villages.

CHAPTER 4
RESULTS AND DISCUSSIONS

This chapter presents analysis and discusses results of the study carried out in the light of objectives articulated in the beginning of the study. This chapter is divided into four sections. First section gives description of the study area, second section presents the socio-economics characteristics of wheat growers in the district Dehbala, and third section explains a summary of average farm wheat enterprise budget. The fourth section combines these budgets with macroeconomic variables and the wheat international markets. The Policy Analysis Matrix (PAM) budget is projected for wheat production. Finally, measures of comparative advantage and indicators of policy effects are projected that give an alternative method to compare activities with different units of measurement and scale of operations from the elements of PAM. These conventional measures of comparative advantage are Domestic Resource Cost (DRC) Ratio; social Benefit cost (SBC) Ratio and indicators of policy incentives which are Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC), Producer Subsidy Equivalent (PSE), and Subsidy Ratio to Producer (SRP). These ratios are the decision making tools for comparative advantage and policy effects while net private profitability (NPP) is the ratio of domestic price compare to world price which is ultimately the decision tool for competitiveness and farmers will continue production as far as they are competitive.

4.1. Description of the Study Area

This study was conducted in the Dehbala District of Afghanistan. It is in Nangarhar Province which lies 30Km away from Jalalabad and 150 Km East of Kabul. It is comprised of 67 villages, 5170 total farmers out of total farmers 3650 farmers cultivate wheat and have 9,600 hectare total irrigated land out of total irrigated land farmers cultivate on 6700 hectare irrigated land, wheat is the most popular cereal crop, other crops are corn, cotton, tomato, potato, onion, eggplant and fruits are walnut, apricot, pomegranate and plume. The sources of irrigation are river, karezes and springs. A population of 55320 is spread over an area of 385 sq.km. 70% source of the income is generated through Agriculture. Each household has an average of 1.5 acre of land. 80% of the area is irrigated land and 20% is rain fed (GoA, 2007).

Jalalabad is the capital of Nangarhar province. The Jalalabad – Torkham road is an important trade route which links South Asian Countries with Afghanistan. Nangarhar shares a border with Pakistan's Khyber-Pukhtoonkhwa province. The majority of population in both Nangarhar and Khyber-Pukhtoonkhwa are Pashtun and in both provinces, most of the people have same tribal system. Jalalabad lies on an ancient trade route leading from Kabul via the Khyber Pass to Peshawar. It lies between 34.4261 N latitudes and 70.4479 E longitudes and its population is 134, 251, 4.00.Nangarhar is bordered by the provinces of Kunar in the North-East, Laghman in the North-West, Kabul and Logar in the West, and Paktya in the South-West. It covers a land area of 7,533 squared kilometers, representing 1.17 percent of the total Afghan territory. The province covers an area of 7616 km2. More than half (54.8%) of the province is mountainous or semi mountainous terrain while around two-fifths (39.5%) of the area is made up of flat land. There are 182425 households and households on average have 8 members. Around 87% of the population of Nangarhar lives in rural districts while 13% lives in urban areas. The province is divided into 22 districts and home to 5.8 percent of the total population of Afghanistan. Nangarhar has 97,000 hectares of arable irrigated agricultural land. Nangarhar can rightly be called the food basket for the whole of Afghanistan because the major crops and fresh vegetables grown here all over the year. Main summer crops grown in the province are, rice, maize, cotton, sunflower, beans, potato and the winter crops are wheat, barley, sugarcane and onion(GoA, 2007).

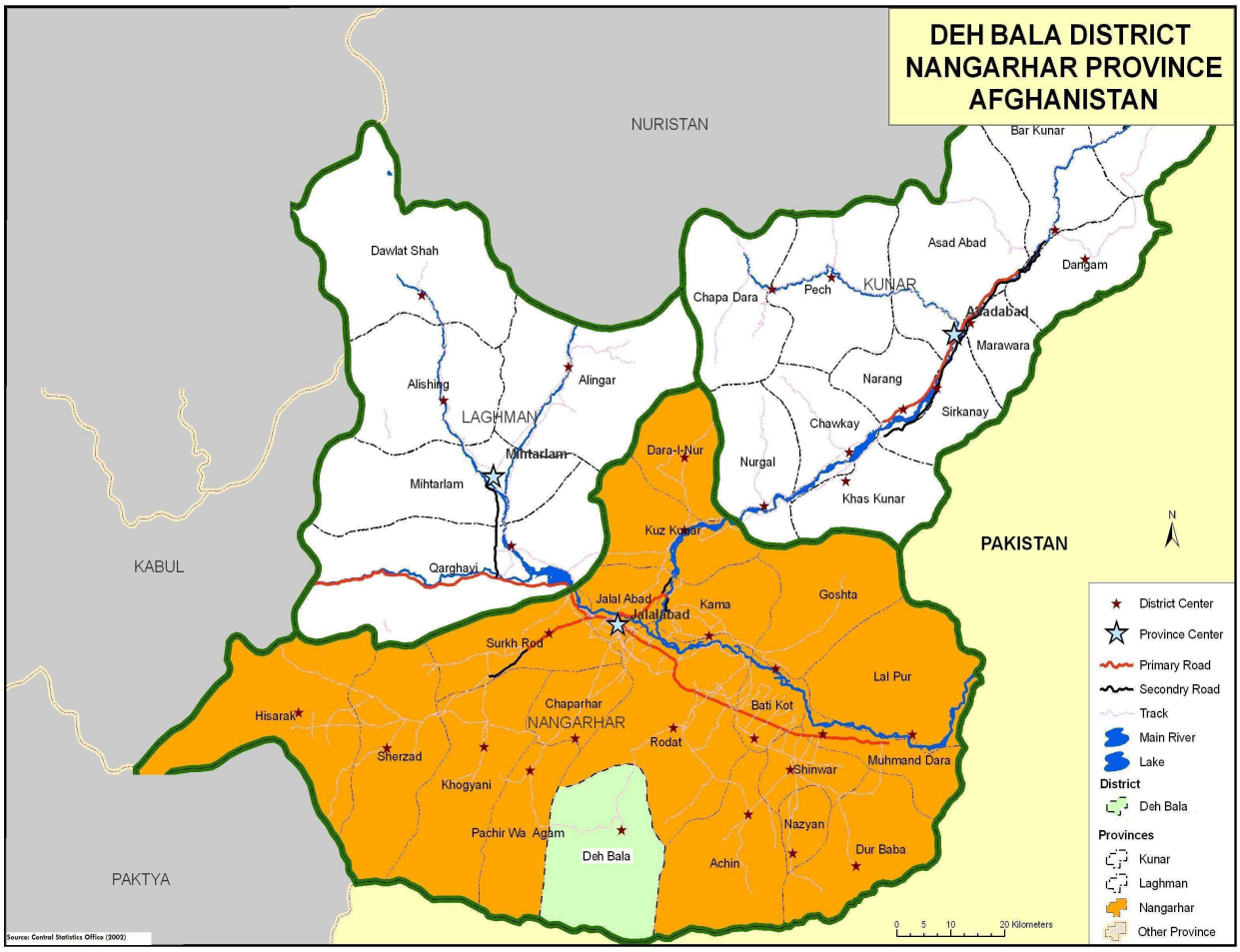


Figure 4.1. Map of Nangarhar Province

4.2. Socio-Economic Characteristics of Wheat Growers

Socio-economic characteristics of the respondents also affect the competitiveness and efficiency and therefore facilitate researcher in understand and explaining the results of the study. These factors include age and educational status of the selected farmers besides other characteristics in the research area.

4.2.1. Age of Respondents

The age of the farmers plays a vital role in agricultural activities, and has a direct bearing upon his attitude towards observing and tackling the ideas or the things that happen to come into the sphere of his experience, new technology adoption, and long hour working in the field. The average age of the sample farmers in the two villages was 41 years ranging from 20 to 60 years with standard deviation of 9.98. The average age of farmers in village Yaghiband was found to be 39 years ranging from 20 to 60 years with a standard deviation of 9.72. In village Shakhmedan, the average age was 44 years ranging from 20 to 60 years with standard deviation of 9.72 (Table 4.1).

Table 4.1 Age of Sampled Respondents

Age (Years)	Yaghiband	Shakhmedan	Overall
Mean	39	44	41
Minimum	22	30	22
Maximum	60	70	70
St. Deviation	9.72	9.72	9.98

Source: Field Survey

4.2.2. Educational Status

Education plays a key role in the behavior formation, improving specific skills, methods of solving problems, thereby developing attitudes, amicable to production. Education plays a vital role in learning any new skill. Literate people have a greater capacity to learn and accept innovation than illiterate people. The respondents were categorized into illiterate, under matric and matric and above. The results show that the literacy rate among the sampled respondents in the study area was much lower. In three villages, the average level of education was 6 regular schooling years ranging from 0 to 16 years with standard deviation of 5.52. The average education level of sampled farmers in village Yaghiband was 8 regular schooling years ranging from 0 to 16 years with standard deviation of 5.34. The average level of education of sampled respondents in village Shakhmedan was 4 regular schooling years ranging from 0 to 16 years with a standard deviation of 5(Table 4.2).

Table 4.2 Education of Respondents

Education	Yaghiband	Shakhmedan	Overall
Mean	8	4	6
Minimum	0	0	0
Maximum	16	12	16
St. Deviation	5.34	5	5.52

Source: Field Survey

Therefore, it is concluded that the average age of the sample farmers in the two villages was 41 years. In two villages, a maximum of 48 % sampled farmer's falls in the age group of 31-40 years. The results show that the literacy rate among the sampled respondents in the study area was much lower.

4.3. Farm Budget for Wheat Crop

Table 4.5 highlights the costs involved in wheat production for all of the average farms in the study area. These include land preparation, seed and its sowing, irrigation, plant protection, manures and fertilizers, harvesting and threshing, land rent, marketing and transportation.

4.3.1. Land Preparation

During land preparation, the operations undertaken are; ploughing, and leveling. The most widespread source of ploughing used was tractor plough, in the study area; none of the respondents reported the use of bullocks plough. In the study area, human labour was used for only minor work, all the major work was done with the help of tractors which were rented from other farmers and the farmers use imported tractors. This district is 30Km nearby to the city of Jalalabad therefore rented tractors with in the district and city are easily accessible. These tractors were imported from neighboring countries and mainly from South Asian and Central Asia. The per acre cost of land preparation for farm size was Rs. 3000, which were 8 percent of the total per acre cost of land preparation of wheat production in district Dehbala respectively.

4.3.2. Seed and Sowing

Seed and sowing cost include the cost of seed wheat, seed transportation charges and labour engaged for the seed treatment for good germination and it's sowing in the field. The seed is provided by the farmers themselves from the previous harvest. The farmers mostly used their own seed in the study area. International organizations like USAID has distributed continuously wheat seed and fertilizers in the Eastern Region especially Nangarhar province during alternative livelihood programs for the eradication of opium but the farmers don't use those seeds because of the lack of trust. The farmers told that the seed provided by USAID is not pure and hybrid seed and if they grow they will lose their crop during the year because of the corrupt officials. The farmers have used those seeds for their household consumption but not for planting. The per acre cost of seed and its sowing calculated for the farms were roughly identical. However, in the study area, farmers engage the family and hired labor for seed preparation and sowing and no evidence of mechanical seed sowing is recorded. The cost of seed and its sowing observed were Rs. 1940(5 percent of the total cost) for average farm.

Table 4.3 Average Farm Wheat Enterprise Budget 2010 in Financial Prices per/acre

Operations	Units	Farm		
		Qty	Unit Cost (Rs)	Total Cost (Rs)
Pre-Sowing				
Ploughing and leveling with Tractor	Hrs.	3	800	2400
Labour for land preparation	M-Day	2	300	600
Sub: total (a)				3000
Seed and Sowing				
Seed used	Kgs.	62	20	1240
Seed treatment	L/Sum	1	400	400
Labour + Transport charges for seed	M-Day	1	300	300
Sub total (b)				1940
Irrigation				
Labour cost of all irrigation cleaning	M-Day	2	300	600
Sub total @				600
Intercultural Practices				
Pesticides/weedicides/ fungicides	Bottles	2	400	800
Weeding	M-Day	2	300	600
Spray pumps	Days	1	100	100
Labour charges for application	M-Day	2	300	600
Sub total (d)				2100
Manures and fertilizers				
FYM + transportation	T-Trolley	2	500	1000
Labour for FYM application	M-Day	3	300	900
DAP	Kgs	48	64	3072
Urea	Kgs	82	32	2624
Labour for fertilizers application	M-Day	3	300	900
Sub total (e)				8496
Harvesting and threshing charges,				
Harvesting charges	M-Day	8	300	2400

Threshing charges used	Hrs	4	1200	4800
Bagging charges used	Rs	20	44	880
Labour charges	M-Day	6	300	1800
Sub total (f)				9880
Land use expenses				
Rent of hired land for 6 month	Acre	1	4000	4000
Opportunity cost of land	Acre			
Sub total (g)				4000
Grand total I (a+b+c+d+e+f+g)				**30016**
Quantity of Production (kg/Acre)	kg			1680
Total Income (Quantity of production + wheat straw)	**Rs**			**41600**
Wheat Straw (by-product)	Rs	2000	4	8000
Price of 1kg of wheat	Rs	1	20	20
Net Income or Profit (I – Total Income)	**Rs**			**11584**
Net Income/kg (Net Income/ Quantity of production)				6.89
Total Marketing Cost				
Transportation to truck and wholesale market	Rs	20	160	3200
Storage charges	Rs	24	60	1440
Labour for loading and unloading	Rs	15	22	330
Commission (3 percent)	%age			1200
Total II				**6170**
Total input (Total Income + II)	Rs			47770
Average wholesale price	Rs	1	26	26
Average wholesale price	Rs	40	26	1040
Average wholesale price/acre	Rs	1680	26	43680
Wheat Straw (by-product)	Rs	2000	5	10000
Total Income (average wholesale price/acre + wheat straw)	Rs			53680
Net profit /acre (Total Income – Total input)	**Rs**			**5910**
Net Income / kg (Net profit/ quanitity of production)	Rs			3.51

Source: Survey Data

4.3.3. Irrigation

In the survey area, all the respondents reported that water is free of charge. All the farm holders confirmed that the sources of water are the river, spring and kareez water for irrigation. The Irrigation system is being managed by villagers, for their timely irrigation of their field and advance planning. The only cost incurred on irrigation was the labour cost. The irrigation system in the local language which they called the mahrab system which is managed by the local community members to avoid conflict over water. Furthermore, irrigation is also one of the non-traded components of the PAM. The per acre cost of irrigation include the labour engaged for cleaning of water courses and irrigating the field amounts of Rs. 600 (2 percent) for average farm were projected in the study area.

4.3.4. Intercultural Practices/Weedicides/Pesticides

The intercultural practices carried out were; weeding, application of pesticides/weedicides/fungicides against pest and disease and spray pump charges and labour charges for application in all the farms, the respondents reported that weeding, done by engaging the human labour, particularly family labour. The further exploration showed that the farmers use more pesticides; farmers mostly were dependent on their farms land if it is destroyed or damaged by disease or pests, and the whole effort will be distressed. The farmers use imported pesticides. The farmers don't have formal knowledge about the pesticides and its application but they use according to the general use in the district. There are no proper extension services to extend their knowledge about proper diseases and pests. The farmers of the study area are using imported pesticides. The per acre cost involved in intercultural practices weedicides/pesticides for average farm was Rs. 2100 (6 percent).

4.3.5. Manures and Fertilizers

The farmers of the study area use both chemical fertilizers and farm yard manure (FYM). The costs of fertilizer/FYM include the costs incurred on purchase of fertilizers, transportation and labour engaged for its application in the filed. The farmers use imported fertilizer. The farmers of the study area are using more fertilizers for the fertility and good yield of wheat crop. Mostly these fertilizers are available in the local market and also bring from the city of Jalalabad. An amount of Rs. 8496(23 percent of total cost) per acre was calculated for average farm.

4.3.6. Harvesting and Threshing

Harvesting and threshing are the very essential activities in the whole production process of wheat, and the second largest contributor to the total cost of wheat production in all the farms. Harvesting and threshing costs include labour charges engaged for cutting of crop and also heaping of bales, threshing and cost of jute bags and labour cost involved for filling the jute bags. Mechanical thresher was used for threshing of crop. The threshers same like tractors were rented from the local farmers but these threshers are also imported. The per acre cost incurred on harvesting and threshing was Rs. 9880 (27 percent) for average farm.

4.3.7. Land Rent

An important contributor to the total cost of wheat crop production was the market value of land. The value of agricultural land, for example, is usually determined only by the land's worth in growing alternative crops. But the social opportunity cost of farm land is sometimes difficult to estimate. The process of land rent is applied through the interactions among the local farmers directly but It is convenient in assessing farming activities to reinterpret crop profits as rents to land and other fixed factors (for example, management and the ability to bear risk) per hectare of land used. The market value of one acre land for six months for wheat production was Rs. 4000 (11percent) for all average farms. The opportunity cost of one acre land with the best alternative crop (onion) was Rs.8000 per acre for six months, which is the social opportunity cost of land. The onion is a commercial crop as exported from

Nangarhar to Pakistan but also it is labor intensive crop compared with wheat production. The people from the other district can not buy the land in Dehbala, because the priority of having the land is only for the community people in whom these have share in the land or nearby. The price of the land is fixed in these villages and its value depends on irrigated, rainfed, having road access, better soil fertility and better location. In general best alternatives for a farmer in Afghanistan that he can earn $500-$600/ha of wheat but the same land can yield $25000 if saffron is cultivated as for example in Western Region of Afghanistan Hirat province which is more suitable for saffron production. Similarly $16000 for pomegranates and $13,000 for almonds in other regions where production is high. Therefore, Afghanistan could become a major exporter of fresh and dry fruits but not of wheat.

4.3.8. Marketing and Transportation

The third major contributor to the total cost of wheat crop production and marketing is the cost of marketing. This includes transportation cost from the farm to the wholesale market, the commission paid in the wholesale market, loading/unloading charges, and other unforeseen expenses. The per acre cost on transportation and marketing were almost identical for all farms. The per acre cost of marketing and transportation calculated for the average farm was Rs. 6170 (17 percent of the total cost) to the wholesale market of Jalalabad city of Nangarhar province from Dehbala district. The transportation is done mostly through trucks, pickups and sometimes tractors.

4.3.9. Yield

The per acre wheat yields almost similar with tiny differences among all farms. The difference is in the efficiency of the farmers in wheat production. The small size farmers are more efficient as compare to the medium and large farmers because they are using resources efficiently. Furthermore, the young farmers are also more efficient in the production of wheat in the study area as compare to old farmers but the old farmers have more experience. The average wheat yield of 1680 kg per acre was estimated for the farm.

4.3.10. Wheat prices

The study showed that there was a variation in the wholesale market price of wheat in the research area. The wholesale price for 40kg of wheat was Rs. 1040 in the wheat wholesale market of Jalalabad, Nangarhar province. The price of one kg in the wholesale market of Jalalabad was Rs.26 while the price of wheat at the farm gate is Rs.20.

To sum up, the cost of wheat production per acre includes 8 percent of the total per acre cost of land preparation, 5 percent of the total per acre cost of seed and sowing, 2 percent of the total per acre cost of irrigation, 6 percent of the total per acre cost of intercultural practices, 23 percent of the total per acre cost of manures and fertilizers, 27 percent of the total per acre cost of harvesting and threshing, 11 percent of the total per acre cost of land, and 17 percent of the total per acre cost of marketing and transportation in district Dehbala respectively. Furthermore, the average wheat yield of 1680 kg per acre was estimated for average farm and the wheat price of one kg of wheat at the farm gate is Rs.20. The net income for the farmer per acre was Rs.11584 and the net income per kg was Rs.6.89 while the price of one kg of wheat in the wholesale market of Jalalabad was Rs. 26. So, the price of 40kg of wheat in the wholesale market of Jalalabad was Rs. 1040. Then net income for the wholesaler was Rs. 5910 per acre and the net profit per kg was Rs. 3.51.

4.4. Estimation of PAM Budgets and Underlying Assumptions

According to Monke and Pearson (1989), this matrix consists of profitability identity and effects of divergences. They define profitability as the subtraction of costs from the revenues and the effects of policies as the transfer between market prices and social prices. Furthermore, there are tradable inputs and domestic factors. The tradable-input and domestic factor components based on the intermediate inputs-including fertilizer, pesticides, purchased seeds, electricity, transportation and fuel.

The factors of production such as capital and labor are used in a crop production. A trade policy can apply only to a tradable good because these commodities are available in the foreign markets if trade flows exist and subsidy policies can be applied to all goods, including nontradables such as electricity and water that have high international transport costs. Total costs are seemed to be dominated by other intermediate inputs such as electricity and transportation as non tradable inputs which are not available on foreign markets.

The budget items and their values are directly taken from the table 4.3. The third column of the matrix shows the value of tradable inputs that is estimated from column two based on the proportion of tradable inputs given in Appendix 4. The market values of the budget items are presented in the fourth column. Finally, the last column of budgets reports any difference of resources due to market failure or government policies in both markets.

4.4.1. Output

As appendix 3 shows the market price and opportunity cost of the wheat. To calculate the private prices or market prices for the wheat, it uses wholesale market prices. From the observation of the Jalalabad wholesale market then the wholesale price of 40 kg wheat was Rs 1040. Total revenue of the respective farm is a product of per acre wheat yield (output) and the market price of wheat. The revenue at social opportunity cost values are calculated by multiplying the output by import parity price for import substitution. The CIF price received at Karachi Port (Rs. /40Kgs is 488 and the import parity price at the farm gate is 782 and these prices are given in the appendix 1. The transport and other charges (cost of packaging, processing charges, handling charges and unforeseen charges) are the observed prices of Peshawar transport authorities which are also given in the appendix 1.

4.4.2. Labor

Labor is listed after output in the PAM budgets and opportunity cost of labour is simply equal to the marginal value product that is the marginal output of labour forgone elsewhere because of its use in the production of wheat (Monke and Pearson 1989). Similarly, labor used to produce wheat cannot simultaneously provide services elsewhere in agriculture or in other sectors of the economy. Their social opportunity costs are calculated by the net income given up because alternative activities such as fruit orchards, livestock keeping, bee keeping and poultry enterprise, are deprived of the labor and capital services applied to wheat production. The labor is fully employed in the agriculture sector of wheat production. 70% of income is generated in the study area through agriculture. More than 60% of the farmers are involved in the cultivation of wheat in the study area. The indirect labor is obtained by adding up the non tradable components of tradable inputs related to wheat production activities as shown in Appendix 4. Moreover, after the tradable inputs are estimated, then the non-traded segment of intermediate inputs is divided into labor and capital according to their percentage share in these inputs. The allocation of costs of labor in the appendix 5 has been estimated on the basis of the appendix 4.

4.4.3. Capital

The next item in the PAM budget is capital. The capital which consists of the rent of the land and operational resources. The market price of the land is the rent of the land. According to Department of Agriculture District Dehbala (2010), the opportunity cost of the land is

determined by the profitability of land in the profitable crop for district Dehbala as shown in Appendix 2 is onion. The opportunity cost of the alternative crop onion is Rs.8000 in the study area. The people from the other districts can not buy the land in Dehbala, because the priority of having the land is only for the community people in whom these have share in the land or nearby. The price of the land is fixed in these villages and its value depends on irrigated, rainfed, having road access, better soil fertility and better location. The allocation of costs of capital in the appendix 5 has been estimated on the basis of the appendix 4. In general best alternatives for a farmer in Afghanistan that he can earn $500-$600 ha of wheat but the same land area can yield $25000 if saffron is cultivated as for example in Western Region of the country that in Hirat province which is more suitable for saffron production. Similarly, $16000 for pomegranates and $13000 for almonds in other regions of the country where production is high. Therefore, Afghanistan could become a major exporter of fresh and dry fruits.

4.4.4. Tradable

The last item is tradable inputs of PAM budget which are defined as inputs which can be traded in the foreign markets. Most of the tradable goods for agriculture are imported from foreign countries. The farmers mostly use the imported inputs in the agriculture in the study area. Trade policy can be applied only to tradable goods while subsidy policies can be implemented to both tradable and nontradable goods. For example electricity, water and marketing activities are non tradable because they are not available on international markets. The information about the allocation of costs between traded and non-traded and labor and capital are received from the production site and the Ministry of Agriculture of Afghanistan. The allocation of costs between traded and non-traded in the appendix 5 has been estimated on the basis of appendix 4.

Finally, all of the above were the estimation of PAM budgets and Underlying assumptions.

Table 4.4. PAM Budget of Wheat for average farm in Dehbala (Import Substitution Rs/acre)

List of Items	Total output value	Tradable	Value at market	Value at opportunity cost	Difference
Product and by Product	**11040.00**	**11040**	**11040**		
Import Parity (2010)	**19520**	**19520**	**19520**	**18544**	**-7504**
Labour	**14957.68**		**14957.68**	**14957.68**	**0.00**
Labour for land preparation	600		600.00	600.00	
Labour for seed sowing	300		300.00	300.00	
Labour for Interculture/Weedicides/Pesticides	1200		1200.00	1200.00	
Labour for Irrigation and Watercourse Cleaning	600		600.00	600.00	
Labour for Fertilizer	1800		1800.00	1800.00	
Labour for harvesting and processing	4200		4200.00	4200.00	
Labour for Loading and Unloading	330		330.00	330.00	
Indirect(Input)	5927.68		5927.68	5927.68	
Capital	**10745.23**		**10745.23**	**14745.23**	**-4000.00**
Land rental value	4000		4000	8000	
Indirect(Input)	6745.23		6745.23	6745.23	
Tradables	**31586.00**	**17290.10**	**17290.10**	**16425.60**	**864.51**

Land Preparation	3000.00	2550.00	2550.00	2422.50	127.50
Seed and Sowing	1940.00	1687.80	1687.80	1603.41	84.39
Interculture/Weedicides and Pesticides	2100.00	1995.00	1995.00	1895.25	99.75
Irrigation	0.00		0.00	0.00	0.00
Fertilizer/FYM	8496.00	6796.80	6796.80	6456.96	339.84
Harvesting and Processing	9880.00	3952.00	3952.00	3754.40	197.60
Transportation and Marketing Cost	6170.00	308.50	308.50	293.08	15.43
Profitability			**-31953.01**	**-27584.51**	**-4368.51**
Domestic resource cost				14.02	
Social benefit cost				0.40	
Nominal prtection coefficient				0.60	
Effective protection coefficient				2.95	
Producer subsidy equivalent				0.40	
Subsidy ratio to producers				0.24	
Yields (Maunds /acre)	40				
Avg Market price (Rs/Kg)	26.00				
Avg Market price (Rs/40Kgs)	1040.00				
Wheat Straw by Product	10000.00				
Total Value of Wheat Production	11040.00				
Import Parity Price Rs/40 Kgs (2010)	488.00				
Total Value of Import Parity Price	19520.00				

Source: Survey data

4.5. Policy Analysis (PAM) Results

4.5.1. Net Private Profitability (Competitiveness) of Wheat Production

According to Monke and Pearson (1989) competitiveness as costs less revenue at market prices which shows Net Private Profitability. Net Private Profitability can be obtained by the multiplication of total revenue, average total output and average wholesale price and obtained total cost by the addition of costs of inputs at market price. The profit at market price for average farm is Rs. -31953.01 per acre as shown in the table 4.4 and 4.5. It shows that the wheat crop is not a profitable enterprise for farmers. The value for the import substitution is calculated by the subtraction of market value of labor costs, market value of capital costs and market value of tradables from the total market value of wheat production as in the table 4.4. The reason for having no profit at market price of wheat because of the inefficient use of inputs and it is calculated at market prices and not at the opportunity cost. This shows no competitiveness of the region where invested capital has no valuable output and not productive. Furthermore, competitiveness of the region relates with the best skills, infrastructure, technology, use of high quality inputs which will produce wealth, jobs and prosperity in the area which need continuous economic development. Improvements in the infrastructure could permit Afghanistan to diversify its wheat imports and supplement domestic production at lower cost and to protect domestic producers to achieve international competitiveness overtime.

Therefore, it is concluded from the result that farmers of the study area are at loss and not competitive at market price that the wheat crop is not a profitable enterprise for the wheat farmers of district Dehbala because it is calculated at market prices and not at opportunity cost.

4.5.2. Net Social Profitability (Comparative Advantage) of Wheat Production

Social profitability shows the economic efficiency. It is the difference between total benefits and total cost of tradable and non-tradable inputs valued at their shadow prices (Gittinger 1982). Comparative advantage is the ability of an individual, a firm or a country to produce a particular commodity or service at a lower opportunity cost than another competitor or with the highest relative efficiency. Trade patterns are determined by comparative advantage that the differences in national characteristics, variations in technology, factor endowments or tastes and performances. The factors of comparative advantage are land, location, natural resources, labor and local population size. As social profitability (J) is the difference between revenue (F) and costs of domestic factors (G,H) and tradable inputs (I) at the opportunity cost. Furthermore that if social profit is negative; then a structure will not continue to exist without support from the government specific ministry. If a country has a comparative advantage when social profitability is greater than zero then and it uses its resources competently at their opportunity cost. Conversely, if the country has no comparative advantage then the value of NSP is less than zero.

The Social Profitability values for import substitution in all the farms are negative i.e. Rs. -27584.51 as in tables 4.4 and 4.5. This value fro import substitution is calculated by the subtraction of opportunity cost value of labor cost, opportunity cost value of capital cost and opportunity cost value of tradables from the import parity price at opportunity cost value as in the table 4.4. Furthermore, that the wheat cannot be grown in the study area for import substitution. The reasons behind the comparative disadvantage of the crop because of the high opportunity cost of land, increased prices of inputs, low marketing prices, low yield and high marketing and transportation costs if those resources are allocated for other activities such as fruit orchard and rural enterprises then the farmers can have more income. The current situation can be changed by the provision of hybrid seed varieties, technical support services and construction of productive infrastructures, improved crop management and agricultural machinery to replace the human labor in the Dehbala district. Furthermore, if the government adopts the policy of subsidizing the local farmers, import tariffs and quota system can handle the current situation. Also, the value of agricultural land, for example, is usually determined only by the land's worth in growing alternative crops and onion represents the best alternative crop which is commercial and profitable crop but they have no knowledge. However, most of the respondents said that the cost of production of wheat is high and they grow wheat mostly for household consumption.

Therefore, it is concluded that the wheat cannot be grown in the study area for import substitution because the value of social profitability is negative which shows no comparative advantage. The reasons behind the comparative disadvantage of the crop because of the high opportunity cost of land, increased prices of inputs, low marketing prices, low yield and high marketing and transportation costs.

4.5.3. Policy Effects: The Divergence between Private and Social Profitability

The divergences are elaborated by policy interventions or market failure both in input and output market that alter the incentives of the decision makers (farmers) and cause a divergence between private and social profitability. The main objective is to compare private and social profitability of wheat of all farms in Dehbala district with the wheat production in other countries that whether the policy incentives have favored or discriminated against wheat production.

Table 4.5 shows the results of competitiveness and policy effects of wheat production for import substitution. The transfers occur in the output and tradable input markets, as well as in profitability. The transfers in the output (wheat) market in all cases are from society to farmers because the wholesale market price of wheat per 40 kg in the research area was Rs.1040 as in the tables 4.4 and 4.5 while the import parity price was Rs. 488 per 40 kg (Appendix 1). The wholesale market price of wheat in the research area is based on the interview in the local wholesale market. The transfers in labor market are zero because labor market is considered as free. The opportunity cost prices of land are higher than the market prices in capital market then the transfer occurred from farmers to society. The people from the other district can not buy the land in Dehbala, because the priority of having the land is only for the community in who has shared their land or nearby. The price of the land is fixed and the value depends on irrigation, non irrigation, road access, and better location. In general best alternatives for a farmer in Afghanistan that he can earn $500-$600/ha of wheat but the same land area can yield $25,000 if saffron is cultivated as for example in Western Region of Afghanistan Hirat province which is more suitable for saffron production. Similarly, $16000 for pomegranates and $13,000 for almonds in other regions where production is high. Also, the same land area can yield $1, 00000/ha if opium poppy is cultivated which is an illicit crop. Positive transfers in tradable markets indicate the farmers were paying over and above for tradable goods than its cost to society. The per acre transfer in tradable for all farm is Rs. 864.50 as in the tables 4.4 and 4.5. These transfers in the tradable market are from society to producers, indicating the government policy of taxing tradable goods. The policy shows that the production of wheat is encouraged and supported by the policy incentives in the research area for import substitution regime. In less developed countries, economic development take place through import substitution strategies. In this way to protect domestic producers to achieve international competitiveness overtime.

Therefore, it is concluded that the transfers in the output (wheat) market for all the farms are from farmers to society. Also, labor market is considered as free; therefore the transfers in labor market are zero. Furthermore, the market prices are lower than opportunity cost prices of land therefore, the transfer occurred from farmers to society. Also, the positive transfers in tradable markets indicate that farmers were paying over and above for tradable goods than its cost to society. These transfers in the tradable market are from society to producers, indicating the government policy of taxing tradable goods. The aggregate policy affects shows that generally the production of wheat is encouraged by the policy incentives in the research area for import substitution regime.

Table 4.5: Policy Analysis Matrix Results, Competitiveness and Policy Effects of Wheat 2010 (Rs /Acre) (Import Substitution Regime)

	Farm		
	Market Prices	**Opportunity Cost**	**Transfers**
Output	11040	18544	-7504
Labour	12886.78	12886.78	0.00
Capital	10745.23	14745.23	-4000
Tradables	17290.10	16425.60	864.50
Profitability	-31953.01	-27584.51	-4368.50

Source: Author's Calculations from PAM Budget in Appendix 6

4.5.4. The Measures of Comparative Advantage

4.5.4.1. Domestic Resource Cost (DRC) Analysis

To measure the comparative advantage, this research uses the DRC analysis that many researchers have already applied during Policy Analysis Matrix (PAM) to study comparative advantage and competitiveness of agriculture (e.g. Nelson and Panggabean 1994; khan and Akhtar 2006). According to this method, minimizing the DRC is thus equivalent to maximizing

social profits and the country uses its resources more competently. If DRC ratio is less than one then the country has comparative advantage and conversely, a DRC ratio is more than one then the country has no comparative advantage in the production of the specific commodity (Monke and Pearson 1989).

The DRC value is 14.02 as in the table 4.4. This value shows that the wheat farms of the study area have comparative disadvantage. This value is calculated by the addition of opportunity cost of labor cost and opportunity cost of capital cost divided by import parity price at opportunity cost value less opportunity cost value of tradables as in the table 4.4.

4.5.4.2. Social Benefit Cost (SBC) Analysis

Another method to measure the comparative advantage is the Social Benefit Cost (SBC) ratio which has already applied by many researchers ratio (e.g. Nelson and Panggabean 1994; khan and Akhtar 2006). It is the social benefits to the social opportunity costs of resources in the production process. They define the method as SBC = F/ (G+H+I), where F is the revenue (social value) and G, H, I are the costs of tradable and non-tradable inputs, all valued at social prices. If SBC is more than one then social profits are more than social costs and have comparative advantage while less than one then the enterprise shows no advantage.

The results show that the SBC ratio for all the farms are less than unity which reflects that the area has a comparative disadvantage in producing wheat crop as import substitution as in the table 4.4. The SBC ratio 0.40 for all farms which is calculated by the social opportunity cost value of revenue at import parity price divided by the labor cost, capital cost and tradable input cost at social opportunity cost values as in table 4.4.

Therefore, it is concluded from the SBC ratio that all the farms in the study area has comparative disadvantage for import substitution regime which further supports the results of the DRC as discussed earlier.

4.6. The Indicators of Policy Effects

Many researchers have applied Policy Analysis Matrix (PAM) to study comparative advantage and competitiveness of agriculture (e.g. Nelson and Panggabean 1994; khan and Akhtar 2006). Monke and Pearson (1989) have developed some policy effects indicators such as nominal protection coefficient (NPC), effective protection coefficient (EPC), producer subsidy equivalent (PSE), and subsidy ratio to producer (SRP). Following are the indicators of the policy effects:

4.6.1. The first indicator of policy effects

The first indicator of policy effect is nominal protection coefficient (NPC) which is formulized as a ratio that contrasts the observed (market) commodity price with a comparable world (social) price. This formula describes the impact of policy that causes a divergence between the two prices. It is the simplest indicator of policy effects. The NPC is simply defined as the ratio of domestic price of commodity to its border price. In the Pam context, NPC = A/F, where A and F are revenues per acre evaluated at domestic and border prices of the commodity respectively. As an indicator of policy effects, an NPC lower than one means that production of a particular commodity is taxed either because of market failure or government intervention. Conversely, an NPC greater than unity suggests inefficiency of a country in producing that particular commodity and that the price is heavily affected by government policies or other factors (Monke and Pearson 1989).

The value of NPC for import substitution for all farms in the study area is 0.60 which is less than unity which implies incentives to expand production and those wheat farmers are receiving prices more than world reference prices. This indicates that farmers of all the farms are receiving more than the world reference prices due to subsidies and other incentives

provided to the wheat farmers by the government. The production of the wheat is taxed either of market failure or government intervention. Furthermore, the system is receiving protection or this is calculated by market value of all production divided by opportunity cost value of import parity price as in table 4.4.
Therefore, it is concluded that the value of NPC is less than unity which suggests inefficiency of the study area in producing wheat and its price is heavily affected by the government intervention or market failure.

4.6.2. The Second Indicator of policy effects

The second effective protection coefficient (EPC) is an indicator of incentives which measures the degree of policy transfer from product market output and tradable input policies applied by (Nelson and Panggabean 1994; Akhtar and Khan, 2006). Monke and Pearson (1989) also define EPC as the ratio of distorted tradable valued at market prices to its un-distorted valued at border prices. Using PAM elements, EPC = (A-D)/ (F-I). The EPC quickly became and still remains a dominant indicator of policy effects in empirical studies. As such, the EPC is the summary measure of the incentives or disincentives caused by government policies in both input and outputs markets. Using the border price as the reference price, an EPC greater than unity implies price protection and positive incentives to the domestic producer of that commodity while the opposite it true when the EPC is negative but less than unity.

The EPC value given in table 4.4 indicates that for an import substitution regime the values is 2.95 for all farms which is more than unity which shows that input and output were extremely subsidized by government showing the incentives caused by the government policies both at input and output market. The value of EPC that 2.95 for import substitution regime is calculated by market value of total production less market value of tradables divided by the opportunity cost value of import parity price less opportunity cost value of tradables as in the table 4.4. The main reason behind this is the eradication of opium poppy cultivation; the government is giving too many incentives for farmers to grow wheat instead of opium poppy, but still it is a big challenge for the government to increase the revenue of wheat to phase which at least equal or a minutely less than illicit crops.

Finally, the EPC value shows price protection and positive incentives to the domestic producers of wheat caused by the government policies both at input and output market.

4.6.3. The third indicator of policy effects

Producer subsidy equivalent (PSE) is the difference between private profitability and national profitability and as a proportion of private revenue. The producer subsidy would be necessary for removal of array of government farm policies employed in particular country. This will finally leave farm income unchanged. The method is also used to reduce state participation in agriculture and liberalize commodity trade. According to PAM notion, the method is expressed by PSE = O/A (Monke and Pearson 1989).

The PSE value is 0.40% for import substitution regime in all the farms of district Dehbala.The PSE value for import substitution regime shows that for the production of wheat for import substitution needs government positive support to the extent of 0.40% for import substitution for all farms in the research area as in the table 4.4.

4.6.4. The fourth indicator of policy effects

The last incentive indicator is the subsidy ratio to producers (SRP) which is defined as the net policy transfer as a proportion of total social revenues or SRP = O/F. It shows that SRP is the proportion of revenues in world prices that would be required if a single subsidy or tax were substituted for the entire set of commodity and macroeconomic policies. The SRP allows comparisons of the extent to which all policy subsidizes agricultural systems. The

SRP measures can also be disaggregated into component transfers to show separately the effects of output, input, and factor policies (Monke and Pearson 1989).

The SRP value for import substitution regime in the Dehbala shows that the production of wheat needs government positive support to the extent of 0.24% for import substitution as in the table 4.4.

4.6.5. Policy Implications of the study

The results of the study show that socially wheat production is not profitable for import substitution in all the farms. This is confirmed by the values of Domestic Resource Cost (DRC) ratio and Social Benefit Cost (SBC) ratio in all the farms that wheat has no comparative advantage compared with wheat production of other countries. The indicators of policy incentives like Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) show that wheat production is encouraged by the policy incentives for the import substitution strategies. This implies that the current government agriculture and macroeconomic policies are not consistent with competitiveness of wheat production for import substitution because wheat in the study area has no comparative advantage. The analysis further reveals that marketing and transportation, fertilizer, land preparation and land rent were the major cost items in wheat production. This study recommends that we can strengthen our competitiveness in wheat production for import substitution only by decreasing the cost of production, timely availability of inputs and increasing the productivity of wheat by introducing high yielding variety.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The policy analysis illustrates that for import substitution in all the farms, the wheat farmers are receiving more price than the world price because the cost of production of wheat is higher than the imported wheat. The main reason behind this is the eradication of opium poppy cultivation; the government is giving too many incentives for farmers to grow wheat instead of opium poppy, but still it is a big challenge for the government to increase the revenue of wheat to phase which at least equal or a minutely less than illicit crops and not because of the farm size. Also, because of the wheat farmers in neighboring countries have access to less expensive or subsidized inputs.

This study also shows that Afghan farmers are very dependable on imported inputs. Therefore, they have relatively high costs of agricultural inputs, machinery and fuel which are restricting their ability to compete with imported wheat.

The policy analysis clearly indicates that wheat production is not nationally profitable for import substitution but the farmers cultivating wheat for domestic consumption and food security. This implies that the current sets of agricultural and macro-economic policies are not consistent with competitiveness of wheat for import substitution; the government should encourage wheat only for domestic consumption in the study area.

5.2. Recommendations

1. Government of Afghanistan should make an effort to decrease the price of tradable inputs so that it will decrease on one side the cost of production and on the other side should increase average yield, so more vibrant support is necessary for the competitiveness and sustainability.
2. The government should subsidize the inputs in the short term and start of making of agri-industries for input production in the long run in order to stabilize the prices and decrease the cost of production.
3. Afghanistan doesn't require national self-sufficiency in wheat and should import the wheat when it has access to international markets.
4. The government agricultural and macro-economic policies should be consistent with the competitiveness of wheat for import substitution.
5. The ministry of Agriculture should conduct more studies on competitiveness and comparative advantage of all agricultural crops to allocate scarce resources in more efficient way.

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APPENDIX

Appendix 1: Wheat Import Parity Prices Used in PAM Budgets 2010 (Rs/40Kgs)

Steps	Nangarhar, Jalalabad
CIFprice received at Karachi Port (US $ / tonne)	230
CIFprice received at Karachi Port (Rs. / 40 Kgs at Sep 9, 2010 official Exchange. rate US $ = 85)	488
+ Transport and other charges from port to farm gate	224
Cost of packaging	20
Processing charges	32
Handling charges	8
Unforseen charges	10
Import parity price at farm gate	782

Source: South Asia Partnership Pakistan, 2010.

Appendix 2: Land Market Prices Used in PAM Budgets for the Year, 2010(Rs/Acre)

District	Wheat	Onion	Tomato	Cauliflower
Dehbala	4000	8000	6000	7000

Source: Manual for cereal and vegetable cultivation, 2010, Department of Agriculture Dehbala

Appendix 3: Land opportunity Costs Values Used in PAM Budgets (Rs/Acre)

District	Market price	Opportunity Cost/Price
Dehbala	4000	8000

Source: Manual for cereal and vegetables cultivation, 2010, Department Agriculture Dehbala

Appendix 4: Allocation of Costs between Traded and Non Traded and Labor and Capital

Inputs	Traded	Non Traded	Labor	Capital
Product and by product	100			
Pre-Sowing	85	15	100	
Seed and Sowing	87	13	50	50
Interculture/weedicides/pesticides	95	5	100	
Irrigation		100	100	
Manure and Fertilizers	80	20	100	
Harvesting & Threshing	40	60	25	75
Transport and Marketing Cost	5	95	25	75

Source: MAIL, Private sector department, Afghanistan (2010).

Appendix 5: Allocation of Costs between Traded and Non Traded and Labor and Capital

Farm				
Inputs	**Traded**	**Non Traded**	**Labor**	**Capital**
Product and by product	49600.00			
Pre-Sowing	2550.00	450.00	450.00	
Seed and Sowing	1687.80	252.20	126.10	126.10
Interculture/weedicides/pesticides	1995.00	105.00	105.00	0.00
Irrigation	0.00	600.00	600.00	0.00
Manure and Fertilizers	6796.80	1699.20	1699.20	0.00
Harvesting & Threshing	3952.00	5928.00	1482.00	2223.00
Transport and Marketing Cost	308.50	5861.50	1465.38	4396.13
Total	**17290.10**	**14895.90**	**5927.68**	**6745.23**

Source: This table has been estimated on the basis of appendix 4

Appendix 6: Wheat Enterprise Budget by Farm 2010 (Rs/acre)

Operations	Farm	
	Costs	**Percent**
Pre-Sowing	3000	8
Seed and Sowing	1940	5
Intercultural Practices	2100	6
Irrigation	600	2
Manures and fertilizers	8496	23
Harvesting and threshing	9880	27
Marketing and Transportation	6170	17
Land rent	4000	11

Source: Survey Data

QUESTIONNAIRE FOR WHEAT

01. Name of farmer_____ 1.1. Interviewer _____

02. District_____ 2.1 Date _____

03. Village_____ 3.1Tel no_____

04. Education level of the farmer_____ 4.1 Age of the farmer_____

05. **Area Operated:**

5.1 Total Area owned_____ Acre 5.8 Area under wheat_____ Acre

6-Pre-sowing Operations					
	Operations	**Units.**	**Quantity**	**Unit Cost Rs.**	**Total Cost Rs.**
6.1	Ploughing with Tractor	Hrs.			
6.2	Ploughing with Bullock	Hrs.			
6.3	Planking and leveling with Tractor	Hrs.			
6.4	Planking and leveling with Bullock	Hrs.			
6	**Sub: total (a)**				
7-Seed and Sowing					
7.1	Seed used	Kgs.			
7.2	Seed treatment	Rs			
7.3	Sowing with Tractor	Rs			
7.4	Sowing with Bullock	hrs			
7.5	Transport charges for Seed	hrs.			
7.6	Labour charges	M. Days			
7	**Sub total (b)**				
8-Cost of irrigation					
8.1	Canal / river / tube well	L/Sump.			
8.2	Labour cost of all irrigation and cleaning	L/Sump			
8	**Sub total ©**				
9.Intercultural Practices					
9.1	Pesticides/weedicides/ fungicides	Bottles			
9.2	Hoeing	M. Days			
9.3	Spray Pumps	Days			
9.4	Labour	M. Days			
9	**Sub total (d)**				
10. Manures and fertilizers (for whole crop).					
10.1	FYM + transportation	Tractor			
10.2	Labour for FYM application	M-day			
10.3	DAP Bags	Rs			
10.4	Nitrophos Bags	Rs			
10.5	Urea Bags	Rs			
10.6	Labour for Fertilizer application	M-day			
10	**Sub total (e)**				

11. Harvesting and threshing charges.					
11.1	Harvesting charges	M-day			
11.2	Threshing charges	Hrs			
11.3	Labour charges	M-day			
11	**Sub total (f)**				
12. Land use expenses					
12.1	Rent of hired land	Acre			
12.2	Opportunity cost of land	Acre			
12	**Sub total (g)**				
	Grand Total I (a+b+c+d+e+f+g)				
13. Total Marketing					
13.1	Transportation to home or warehouse	Rs			
13.2	Pesticides/Storage Charges	Month			
13.3	Loading and Unloading/Labour	Rs			
13.4	Commission	%age			
	Total cost II				
14. Total output					
	Output	Unit			
14.1	Grain	Kgs			
14.2	Wheat Straw	Kgs			
14	**Total**	Kgs			
15-Net income					

Figure 1: Map of Afghanistan

Figure 2: Afghanistan, South Asia and Central Asia Region

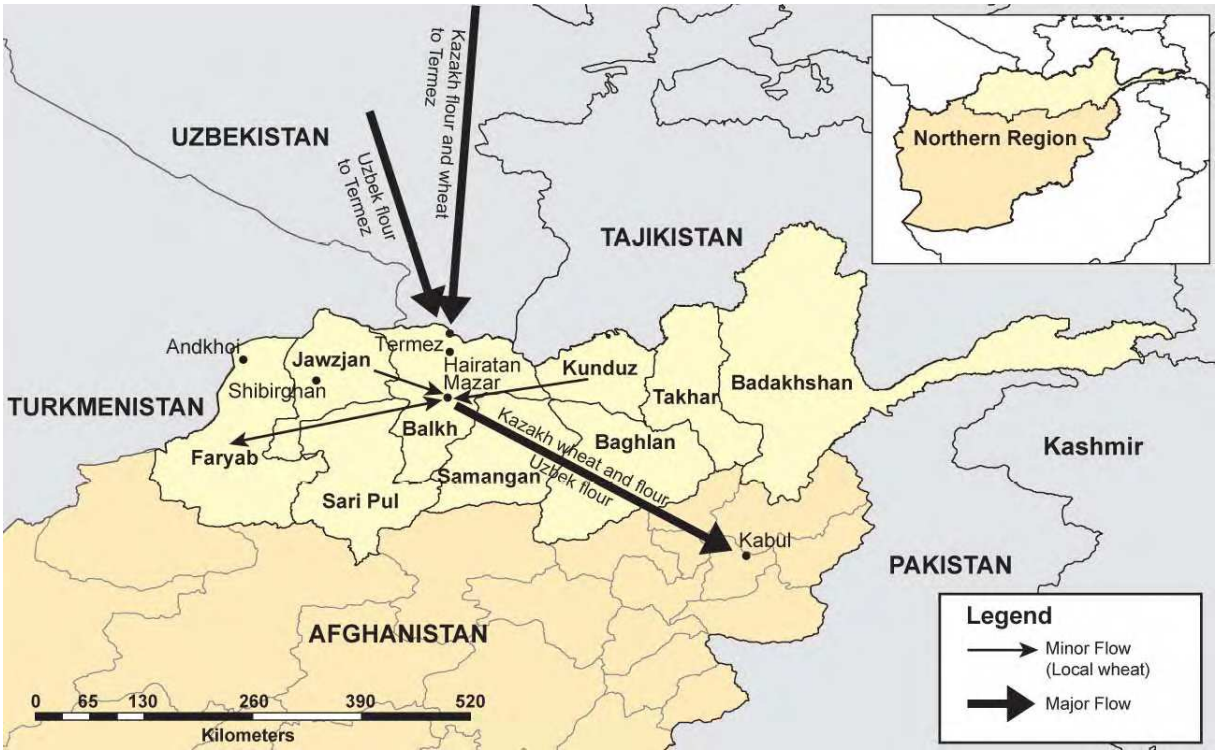

Figure 3: Flows of wheat and wheat flour into Mazar-i-Sharif

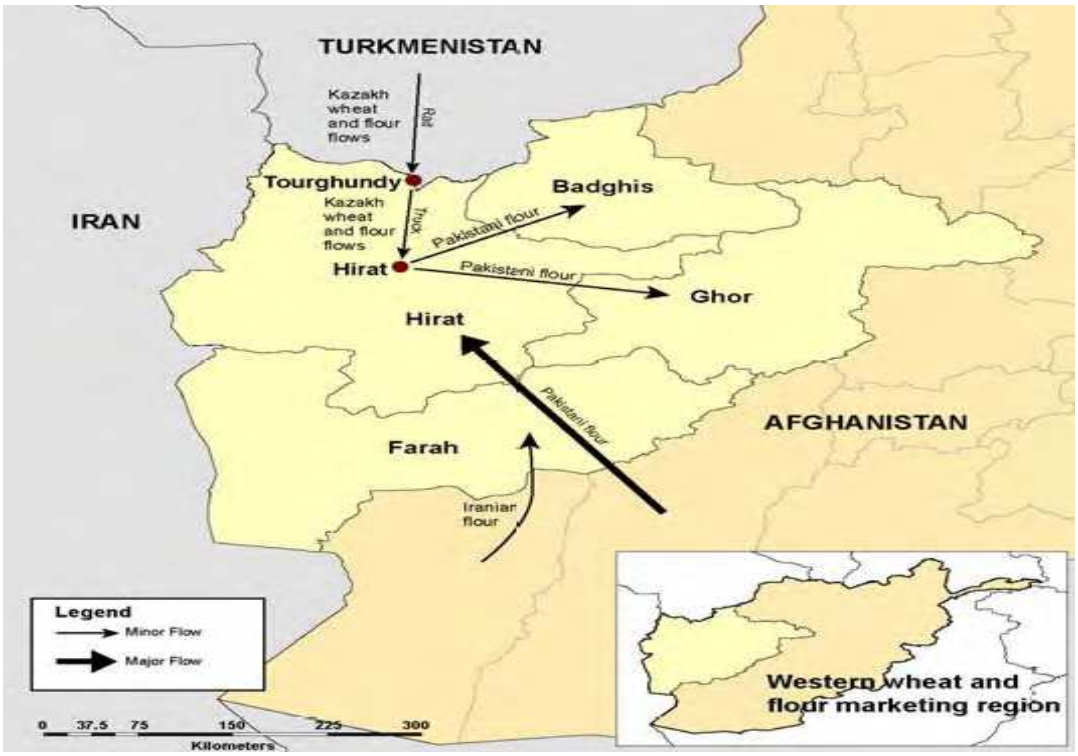

Figure 4: Flour and wheat entry points for western marketing region