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Sugarcane



Rice (Paddy)



Wheat



Cotton

Mission Statement of API

To provide professional inputs to agriculture policy and recommendations relating to major and minor crops for meeting long-term objectives towards enhancing production.

**Agriculture Policy Institute
Government of Pakistan
Islamabad**

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TREND ANALYSIS OF TEA IMPORT IN PAKISTAN

By

Irum Raza, M. Zubair Anver and Dr. Ikram Saeed

Abstract

A study was carried out to check past trends as well as future estimates of tea import in Pakistan. A time series data from 1994 to 2010 were collected from various secondary sources. Three models namely linear trend, quadratic trend and exponential growth curve were compared and the best fitting model was chosen on the basis of three accuracy measures (MAPE, MAD, MSD). Quadratic trend model was found suitable for estimating the quantity of tea import in '000' tones due to the lower values of the accuracy measures whereas for estimating the value of tea in million rupees the errors were minimized more by the exponential growth model and so it was chosen to be pertinent for predicting the future estimates of tea value. Forecasts were made from the year 2011 to 2020. Ten years forecast for the quantity of tea import was 96.86, 92.78, 88.27, 83.31, 77.92, 72.09, 65.81, 59.10, 51.95, 44.35 '000' tones and the forecasts of the value of tea was 15080.1, 15367.7, 15660.8, 15959.5, 16263.8, 16574, 16890.1, 17212.2, 17540.4, 17875 'million.rupees' for the years 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 respectively. The study results show a declining trend of tea import in Pakistan and an increase in its value which shows that in the coming year's tea will become more expensive commodity for the common people of the country. In order to conquer this problem the government should take necessary steps to promote tea production in Pakistan.

Keywords: *Trend Analysis, Forecasting, Tea, Quantity, Value, Pakistan Social Sciences Research Institute, National Agriculture Research Centre*

1. Introduction

1.1 Tea is commonly used as beverage at all levels in the society. The use of tea and its annual demand is increasing over the years lavishly. Presently, Pakistan is importing about 140-150 tones of tea amounting Rs. 22.329 million rupees (GOP, 2011). The import bill for tea during 2011-12 also increased by 4.8 percent on the back of higher import prices during the period (Pakistan Economic Survey 2011-12). The import of tea is mainly coming from Kenya, Indonesia, Srilanka and Bangladesh (Ijazali 2011). The demand for tea is further multiplying due to ever increasing trend of population. If current tea import trends persist, Pakistan would overtake the United Kingdom as the leading tea importer (F.S Hamid 2003).

1.2 Loads of work at national and international level has been done regarding tea imports and its trends in Pakistan. The import volumes and its trends can be explained by demand and supply factors through trade policy, linearization of trade and globalization. Studies show the effects of macroeconomic variables on imports at the aggregate level (Sarmad 1989; Sinha 1997; Arize, et al 2004). The main factors affecting tea import are import duty, domestic consumption, population, economic growth and volume of import of tea (Ijazali and Tanveerhussain 2011). (Timbergen 1946) suggested that for analysis of imports, theories of international trade, are very important. Consumer preferences and consumption patterns are also the key factors that drive the demand of tea.(Yulinado and Akira 2006) estimated the export elasticities of tea. (Hangzhou 2008), conducted two sample surveys of consumer preferences and consumption patterns for determining the factors that drive demand of tea in China.

1.3 Forecasting techniques in agriculture include forecasting of production/yield, area of crops and forewarning of incidence of crop pests and diseases (Ramasubramanianv 2009). Reliable and timely forecast provide important and useful input for proper , foresighted and informed planning in agriculture which is full of uncertainties. Forecast of crop production before harvest are required for various policy decisions relating to storage, distribution ,pricing, marketing, import-export etc. (Ranjanaagrawal 2010). Keeping in view the importance of forecasting techniques in agriculture the present study is designed to determine the past trends as well as the future prospects of tea import in Pakistan using Trend analysis. The objective of study was to identify the best method for estimating tea import in Pakistan.

2. Materials and Methods

2.1 The study was conducted using secondary time series data of quantity of Tea import (000 tones), Value (mlnrs), tea consumption (000 tones) and population (mln) in Pakistan from 1994-95 to 2009-2010. Data were collected from various issues of Economic Survey of Pakistan. Data were analyzed in MINITAB software version 15.

3. Analytic Techniques

3.1 In this study Linear trend, quadratic trend and exponential smoothing models have been employed to forecast tea import and its consumption in Pakistan for the period 2011-12 to 2020-21.

3.1 Trend Analysis.

3.1.1 Trend analysis was used to fit a general trend model to data and provide forecast. Trend analysis includes linear trend, quadratic trend and

growth trend models. The general forms of these models as given in the (MINITAB software 2007) are described below:

- **Linear trend**

$$Y_t = \beta_0 + \beta_1 t + e_t$$

Where:

Y = Quantity of Tea in (000' tones)

β_0 = Constant

β_1 = Regression coefficient (measures the effect of independent variable on the dependent variable)

t = Trend which determines the tendency of time series data to increase or decrease over time.

- **Quadratic trend**

The *quadratic trend model* accounts for simple curvature in the data

$$Y_t = \beta_0 + \beta_1 t + \beta_2 t^2 + e_t$$

- **Exponential Growth model**

The *exponential growth trend model* accounts for exponential growth or decay

$$Y_t = \beta_0 * \beta_1 \hat{t} * e_t$$

4. Accuracy Measures

4.1 Reliability of the forecasting methods was based on three accuracy measures also termed as forecasting errors. These measures include **Mean**

Absolute Percentage error (MAPE), Mean Absolute Deviation (MAD) and Mean Squared Deviation (MSD). Smaller values of all these measures indicate a better fitting model and a better model yields minimum forecasting error (Karim et al., 2010). The best model is therefore selected to forecast Tea import and its consumption in Pakistan for the year 2011-12 to 2020-21.

5. Looking at Original Series

5.1 The trends of quantity of tea import are depicted in (figure 1). The quantity of tea import in Pakistan had a declining trend during the period from 1994-95 to 1996-97. In 1997-98 the quantity of tea import was 98.7 '000' tones and it grew upto 119.7 '000' tones in 1998-99. Ups and downs in the quantity of tea import were found during the period from 1999-2000 to 2007-08. Again a sudden decrease in the quantity of tea import was found in 2008-09 and 2009-10. This decline shows that the quantity of tea import is insufficient to meet the ever increasing tea requirements of the country.

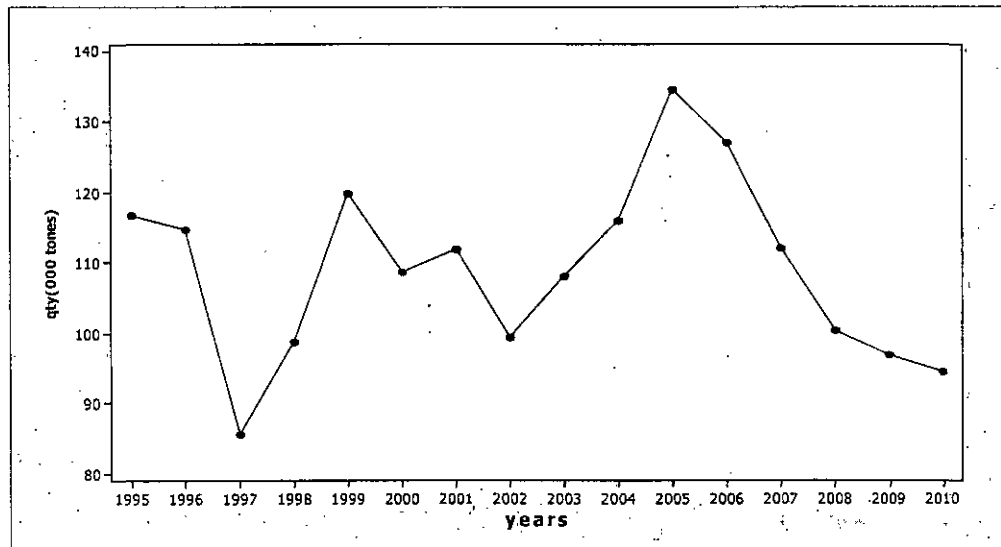


Fig.1 Time series plot showing quantity of tea import in Pakistan during 1994-95 to 2009-2010.

5.2 Trends of value of tea import in million rupees are summarized in fig 2. In 1994-95 value of tea import is 5799.7 (mlnrs) and it grew suddenly upto 57067(mlnrs) in 1995-96. It is apparent from the graph that value of tea import is gradually increasing every year where as the quantity of tea import is decreasing which implies that demand of tea is increasing but its supply is decreasing which also indicates that it is insufficient to meet the tea requirements of our country.

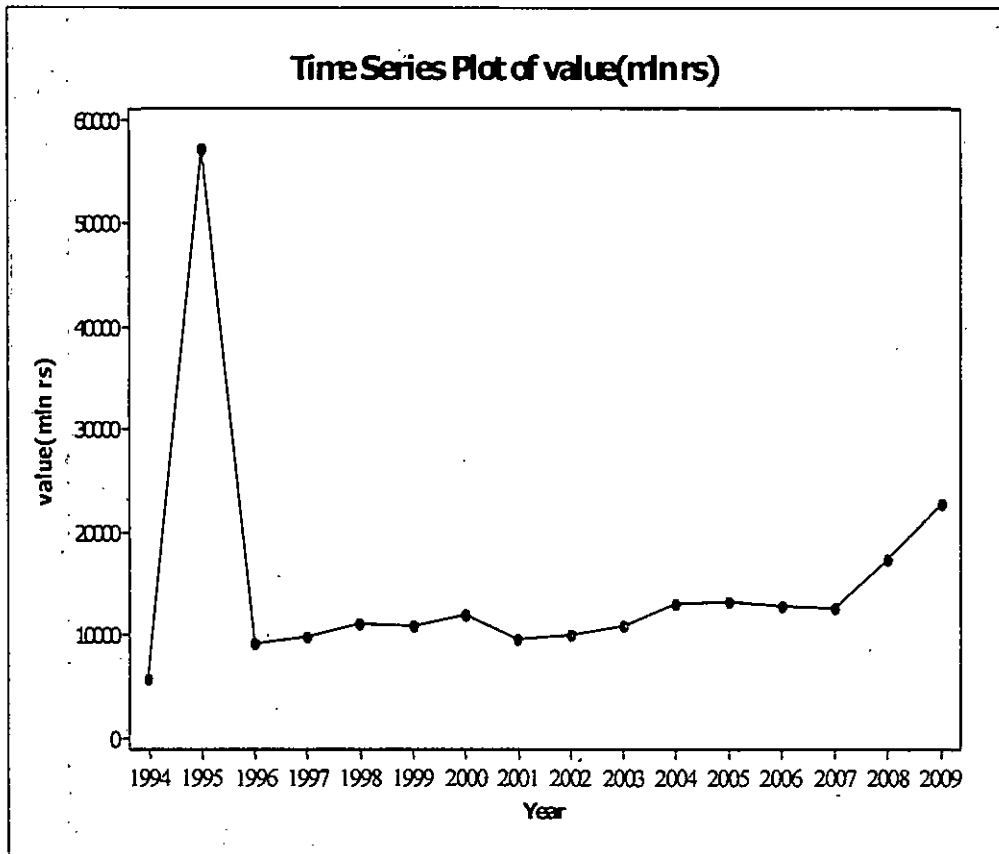


Fig.2 Time series plot showing Value of tea in million rupees.

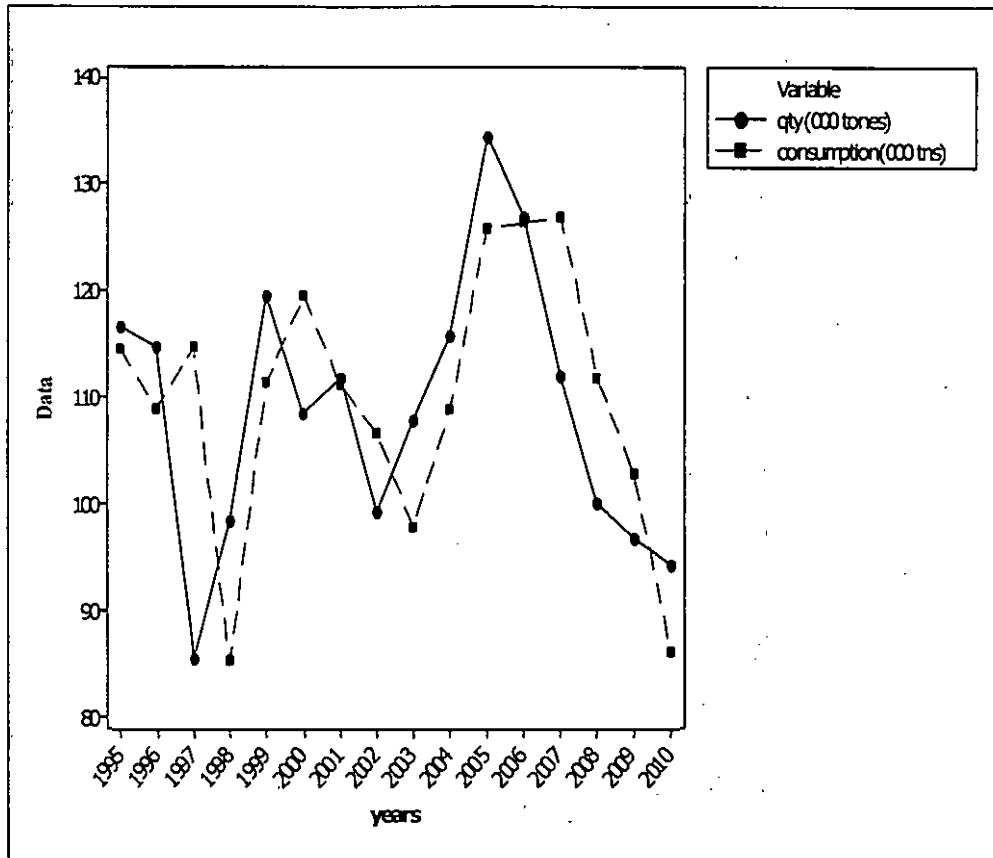


Fig.3 Time series plot of quantity and consumption of tea.

5.3 Trends of tea consumption are changing over time (Fig.3). The consumption of tea has a declining trend during the period from 1994-95 to 1995-96. In a similar manner the quantity of tea has decreased during these periods. In 1996-97 consumption of tea has raisin to 114.80 '000' tones while its quantity has decreased. The causes behind this rise in the consumption are the usage of the substitutes of tea, seasonal effects and the use of tea which was saved last year. Ups and downs are shown in the consumption pattern of tea from the period 1997-98 till 2008-09 and in the end the consumption has again gone down.

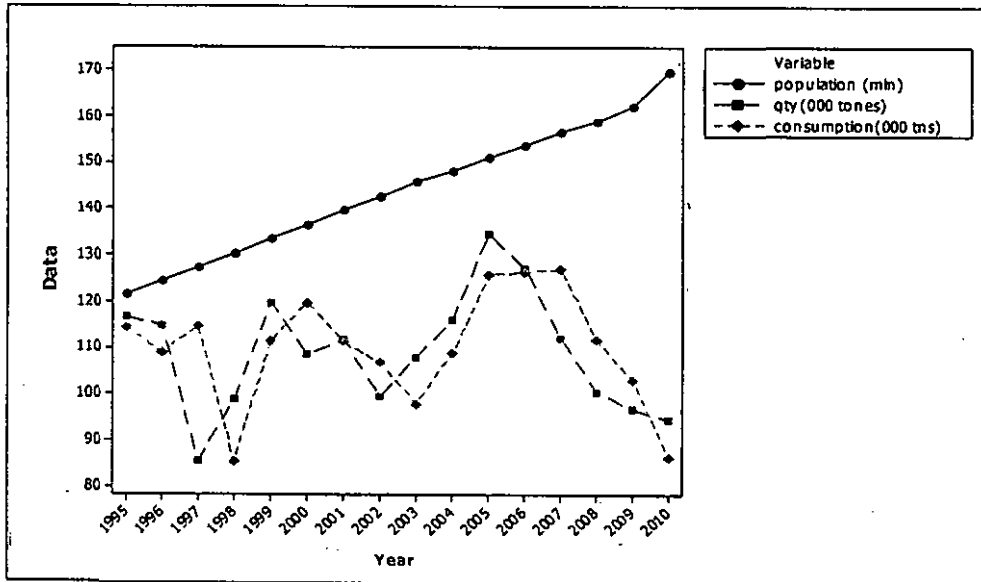


Fig.4 Time series plot of Population, quantity and consumption of tea.

5.4 Trends of population, quantity and consumption of tea are shown in figure.4. It is obvious from the graph that over the year population is increasing and quantity and consumption is decreasing because due to increase in population the unemployed ratio has raised as well as the income of common people has declined which has deprived them of their basic necessities and that is why they are spending less on tea.

6. Selection of the Model

6.1 The values of the accuracy measures for the selection of best forecasting method for tea import in Pakistan are summarized in Table 1. The value of MAPE for quadratic trend model (8.977) was lowest as compared to the values of MAPE for linear (9.301), and exponential growth (9.234) respectively. Similarly the values of MAD and MSD for quadratic trend model (9.62 and 134.622) respectively were smaller than their corresponding values of MAD for linear (9.941), and exponential (9.935) and

corresponding values of MAD for linear (9.941), and exponential (9.935) and the values of MSD (151.88, 152.38) for linear and growth respectively. These values suggest that quadratic trend model provides better fit to data and is suitable for predicting future import of tea in Pakistan.

Table-1: Diagnostic Measures for the Selection of Best Forecasting Method for Tea Import in Pakistan.

Forecasting models	Criteria		
	MAPE	MAD	MSD
Linear trend model	9,301	9.941	151.880
Quadratic trend model	8.997	9.692	134.622
Exponential Growth model	9.234	9.935	152.380

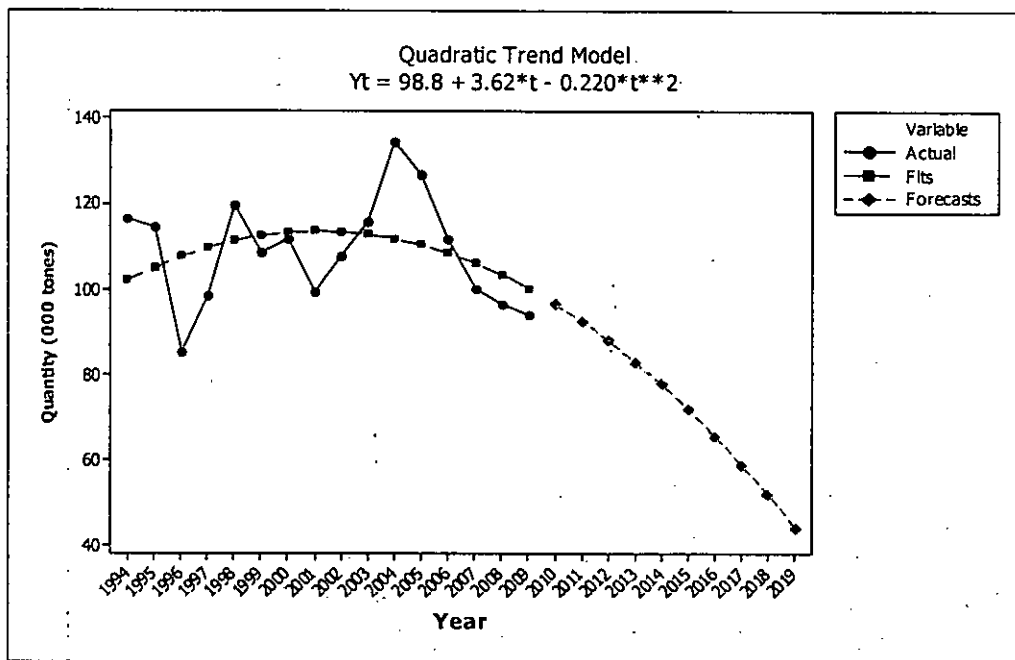


Fig.5 Quadratic trend model for quantity of tea import.

6.2 The values of the accuracy measures for the selection of best forecasting method for tea value in Pakistan are summarized in Table 2. The value of MAPE for exponential growth model (25) was lowest as compared to the values of MAPE for linear (46), and quadratic (42) respectively. Similarly the value of MAD for exponential (5005) was smallest as compared to the values of MAD for linear (6781) and quadratic (5366) respectively. The value of MSD is the lowest for quadratic trend model but it is apparent that error has been minimized more by exponential growth model and is therefore selected suitable for estimating future value of tea in Pakistan.

Table-2: Diagnostic Measures for the Selection of Best Forecasting Method for Tea Value (Mln Rs) inPakistan.

Forecasting models	Criteria		
	MAPE	MAD	MSD
Linear trend model	46	6781	130027528
Quadratic trend model	42	5366	111455420
Exponential Growth model	25	5005	139161650

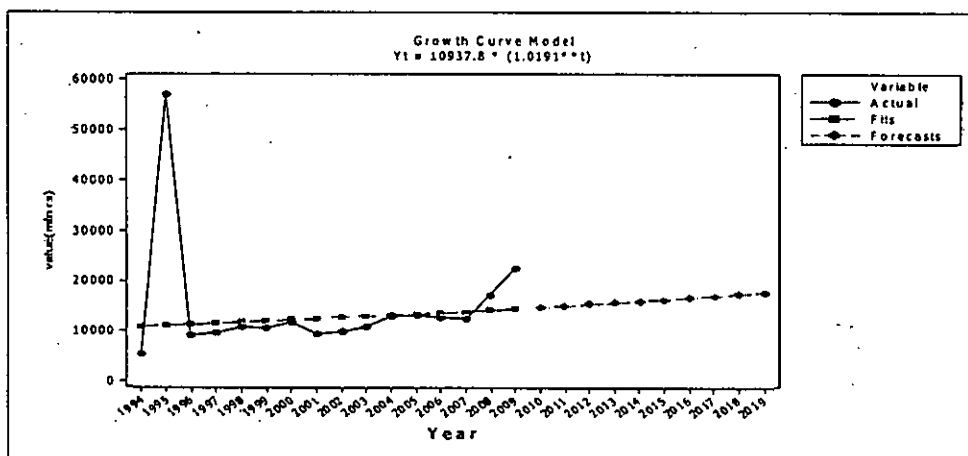


Fig.6 Forecasting Tea import ('000' tones) using quadratic trend model

6.3 The forecasted values of tea import for ten years are presented in Table.3 The estimated import of tea in the year 2010-11 was 96.86 '000' tones.It shows that if the present growth remains the same then the import of tea will be 44.35 '000' tones in the year 2019-20. It is obvious from the analysis that the import of tea will decline in the coming years which also indicates that common people will not be able to purchase tea as it will be much expensive. Quadratic trend model (figure 5) shows that quantity of tea import is declining.

Table-3: Ten Years Forecast of Tea Import ('000' Tonnes) in Pakistan

Year	Forecast
2010-11	96.86
2011-12	92.79
2012-13	88.27
2013-14	83.32
2014-15	77.92
2015-16	72.09
2016-17	65.82
2017-18	59.11
2018-19	51.95
2019-20	44.36

7. Forecasting Tea Value Using Exponential Growth Model

7.1 The estimated values for the value (mlnrs) of tea import are summarized in Table.4. In 2010-11 the value of tea was 15080.1 million rupees it implies that if the present growth rate remains the same then the value of tea will be 17875 million rupees in the year 2019-20. An upward or increasing trend is visible from the figure which makes it even more certain that in the coming year's tea will become more and more expensive.

7.2 Traditionally different time series models such as regression models, Auto regressive integrated moving average (ARIMA) and exponential smoothing methods have been employed to forecast crop production (Box and Jenkins 1976; Brown 1959; Holt et al., 1960). Al khatani et al (1992) made econometric analysis of import to calculate demand function for tea in the Kingdom of Saudi Arabia. Similar studies show the import analysis of tea using time series techniques such as trend analysis and ARIMA model (PURNA CHANDRA PADHAN 2012, Gijo, E.V 2011, Ghafoor et al 2005, and FAO 2003). Gupta G S used ARIMA model for forecasting tea production in India. In a similar study Karim et al, 2010, employed trend analysis and exponential smoothing methods to forecast wheat production in Bangladesh using the model selection criteria such as MAPE, MAD and MSD. The results showed that different model was suitable on the basis of selection criteria.

Table-4: Ten Years Forecast of Tea Value ('000' Tonnes) in Pakistan

Year	Forecast
2010-11	15080
2011-12	15368
2012-13	15661
2013-14	15960
2014-15	16264
2015-16	16574
2016-17	16890
2017-18	17212
2018-19	17540
2019-20	17875

8. Conclusion

8.1 The study results showed that quadratic trend model was the best for forecasting quantity of tea import in Pakistan due to the smaller values of the accuracy measures and exponential growth model was found suitable for estimating value of tea import in Pakistan because errors were minimized by this model. Tea is enjoyed as a beverage at all levels in the country. Unfortunately the import of tea over the years is decreasing at an alarming rate and its price is rising. To get the better of this problem the government should take wiser steps to promote tea production in Pakistan as demand of tea is constantly increasing. Proper use of agricultural inputs can definitely play an active role in supporting tea production in the country.

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WHEAT FLOUR PRICE SHOCKS IN PAKISTAN: A CASE ANALYSIS

By

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Abstract

The current research investigates the wheat flour Price Shocks in Pakistan: A case analysis. Data were collected by using secondary sources by using Time series Analysis, and data were analyzed by using SPSS-20 version. It was revealed that the price of wheat flour increases from last four decades, and trend of price shocks shows that due to certain market variation and supply and demand shocks also play a positive relationship in price shocks in the wheat prices. It was further revealed that Government should take certain measures to stabilize prices of wheat in Pakistan.

Key Words: Time Series, Price, Shocks, Wheat

1. Introduction

1.1 The agriculture sector continues to be essential component of Pakistan's economy. It currently contributes 21 percent to GDP. Agriculture generates productive employment opportunities for 45 percent of the country's labour force and 60 percent of the rural population depends upon this sector for its livelihood. It has a vital role in ensuring food security, generating overall economic growth, reducing poverty and the transforming towards industrialization. The present government is determined to improve the quality of life of the people and to banish hunger and malnutrition from the country by making agriculture an efficient, productive and profitable sector of the economy.

1.2 In order to improve governance in the public sector the government took bold steps and brought in the 18th Amendment to the Constitution of 1973. Accordingly, Ministries performing tasks which were provincial subjects were devolved from the Federal level, including the Ministry of Food and Agriculture. However, realizing the food security concerns across the country the government took timely steps to establish the Ministry of National Food Security and Research to tackle the Food Security issues.

1.3 The newly created Ministry, under the aegis of the present government, has planned to take two major steps in order to solve the food security issues on a permanent basis. The first step is the establishment of the National Food Security Council representing Federal, Provincial and local level Governments. Secondly, through a Letter of Intent the Ministry, in collaboration with World Food Programme, is launching the Zero Hunger Programme worth US\$ 1.6 billion to address the food security objective. Under this Programme the Ministry shall donate upto 500,000 metric tones of wheat per year and the World Food Programme intends to negotiate with local producers to exchange part of the donated wheat for High Energy Biscuits (HEB) and similar products manufactured in Pakistani factories for distributions through WFP operations to primary school children, siblings of malnourished children and the vulnerable population especially children at risk of malnutrition. The fund will also be converted to fortified wheat flour for distribution aimed at combating food insecurity in Pakistan. The WFP will also cooperate in the capacity building of the Ministry's officials in areas addressing food security and monitoring progress.

1.4 In Pakistan, wheat being the staple diet is the most important crop and cultivated on the largest acreages in almost every part of the country. It

contributes 14.4 percent to the value added in agriculture and 3.0 percent to GDP. Over the past three decades, increased agricultural productivity occurred largely due to the deployment of high-yielding cultivars and increased fertilizer use. With the introduction of semi-dwarf wheat cultivars, wheat productivity has been increased in all the major cropping systems representing the diverse and varying agro-ecological conditions.

2. Wheat in Pakistan

2.1 Pakistan has been divided into ten production zones because of great agro ecological areas where wheat is grown. The zoning is mainly based on cropping pattern, disease prevalence and climatological factors. However, production zones need to be revisited. In Pakistan, wheat is grown in different cropping systems, such as; cotton - wheat, rice - wheat, sugarcane - wheat, maize - wheat, fallow - wheat. Of these, Cotton-Wheat and Rice-Wheat systems together account about 60% of the total wheat area whereas rain-fed wheat covers more than 1.50 m ha area. Rotations with Maize-Sugarcane, Pulses and fallow are also important.

2.2 Improved semi-dwarf wheat cultivars available in Pakistan have genetic yield potential of 6-8 t/ha whereas our national average yields are about 2.7 t/ha. A large number of experiment stations and on-farm demonstrations have repeatedly shown high yield potential of the varieties. There are progressive farmers of irrigated area who are harvesting 6 to 7 tonnes yield per hectare. However, farmers yield ranges 0.5 to 1.3 tones per hectare depending on the amount of rainfall in rainfed areas and in irrigated areas it ranges from 2.5 to 3 tones per hectare depending upon the amount of water available and other factors.

Table 1: Area, Production and Yield of Wheat

Year	Area		Production		Yield	
	(000) hectares	% Change	(000) Tons	% Change	(Kgs)/ Hec.	% Changes
2007-08	8550	-0.3	20959	-10.0	2451	-9.8
2008-09	9046	5.8	24033	14.7	2657	8.4
2009-10	9132	1.0	23311	-3.0	2553	-3.9
2010-11	8901	-2.5	25214	8.2	2833	11.0
2011-12(P)	8656	-2.7	23473	-6.9	2714	-4.2

Source: Pakistan Bureau of Statistics.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.767893
R Square	0.58966
Adjusted R Square	0.559636
Standard Error	3477.025
Observations	45

Results: According to the **Annex-I** in which production and acreage of wheat were discussed. There was huge difference year to year from 1961-2012. The Wheat flour price trend was found to be increasing trend. There was price shocks in the years 1961, 1988, 2000 and 2007 where nearly 70-80 % prices were changed.

ANOVA

	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	7.12E+08	2.37E+08	19.63908	4.76E-08
Residual	41	4.96E+08	12089705		
Total	44	1.21E+09			

Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%	Coefficients
Intercept	-5768.27	2665.794	-2.16381	0.036358	-11151.9	-384.585	-11151.9	-384.6
X Variable 1	1.954231	0.439955	4.441889	6.61E-05	1.065724	2.842739	1.065724	2.843
X Variable 2	-0.71805	1.198775	-0.59899	0.552478	-3.13902	1.702927	-3.13902	1.703
X Variable 3	127.9544	47.78352	2.677793	0.010612	31.45359	224.4551	31.45359	224.5

Consider gain the demand for Wheat varieties .One way to analyze these beverages would be to postulate that they form a block independent group and then use demand equation .One disadvantage of this approach is that equation group the nose demand equation .One disadvantage of this approach is that equation involves real income and. through their influence on the Frisch price index $\log P$, the price of other (i.e.. non-Wheat) goods. Conditional demand equations deal only with Wheat and thus avoid the problem. Accordingly a system with a large number of commodities can be transformed into a number of smaller. Independent sub systems, one for each group of goods. In this section, we set out detail of this approach Recall from the retail price. Due to unstable prices of Wheat consumers are paying more every months. The recent price shocks has a negative impact on the consumers.

RESIDUAL OUTPUT

<i>Observation</i>	<i>Predicted Y</i>	<i>Residuals</i>	<i>Standard Residuals</i>
1	7322.614	-3508.61	-1.04535
2	4097.919	-70.9192	-0.02113
3	4419.852	-249.852	-0.07444
4	4540.888	-378.888	-0.11289
5	5250.198	-659.198	-0.1964
6	5062.623	-1146.62	-0.34162
7	3926.496	408.5037	0.121709
8	5492.769	925.2307	0.275662
9	7408.916	-790.916	-0.23564
10	7671.597	-377.597	-0.1125
11	7306.554	-830.554	-0.24745
12	7080.952	-190.952	-0.05689
13	7548.519	-106.519	-0.03174
14	7949.536	-320.536	-0.0955
15	7479.81	193.1898	0.057559
16	8192.841	498.1591	0.148421
17	8864.073	279.9273	0.083401
18	8930.571	-563.571	-0.16791
19	9693.868	256.1318	0.076312
20	10284.67	302.3333	0.090077
21	10525.48	949.5196	0.282898
22	11113.28	190.7203	0.056823
23	11581.05	832.9511	0.248168
24	11598.95	-716.95	-0.21361
25	11557.62	145.3781	0.043314

26	11963.42	1959.576	0.583833
27	12684.14	-668.135	-0.19906
28	12034.15	640.8453	0.190932
29	12980.81	1438.187	0.428491
30	13326.26	989.7408	0.294882
31	13572.77	992.226	0.295622
32	13621.19	2062.812	0.614591
33	14568.41	1588.586	0.473301
34	14167.59	1045.411	0.311468
35	14505.53	2193.472	0.65352
36	14714.63	1659.367	0.494389
37	14884.26	1968.737	0.586562
38	15113.47	2303.526	0.686309
39	15127.72	2606.28	0.776511
40	15471.91	3738.087	1.11372
41	15479.34	3840.659	1.14428
42	15481.54	3961.457	1.18027
43	15619.91	-13664.9	-4.0713
44	16276.69	-14288.7	-4.25715
45	1403.596	562.4036	0.167562

The trend of Wheat flour prices were changes from the above trend. It has direct relationship with the demand of the market and supply shortage from time to time increased the prices of wheat in Pakistan. In Pakistan have genetic yield potential of 6-8 t/ ha whereas our national average yields are about 2.7 t/ha. A large number of experiment stations and on-farm demonstrations have repeatedly shown high yield potential of the varieties. There are progressive farmers of irrigated area who are harvesting 6 to 7

tonnes yield per hectare. However, farmers yield ranges 0.5 to 1.3 tones per hectare depending on the amount of rainfall in rainfed areas and in irrigated areas it ranges from 2.5 to 3 tones per hectare depending upon the amount of water available and other factors.

3. Conclusion

3.1 The current research explore the wheat prices shocks and wheat flour prices in Pakistan. The results of the analysis indicate that wheat growers are responsive to changes in the wheat of wheat in the case of production and acreage under wheat response. The lagged wheat of cotton has no significant impact on the production of wheat and acreage under wheat. This may be attributed to the reason that cotton is grown on marginal lands and usually in the western areas of Pakistan. The cultivation of cotton is also risky due to the attack of pests. Government of Pakistan should fix the price of the Wheat and also take some measures to control the prices of Wheat.

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Acreege, Production and Price of Wheat: 1961-2012

Years	Acreege under Wheat(000)	Production under Wheat(000)	Price of Wheat Rs/Monds.	Average Price of Wheat Flour
1	2	3	4	5
1961	6639	3814	15.62	16.46
1962	4923	4027	14.49	16.88
1963	5022	4170	13.78	16.85
1964	5019	4162	15.25	15.27
1965	5317	4591	16.65	33.34
1966	5155	3916	15.18	14.84
1967	5344	4335	2290	19.32
1968	5983	6418	2026	23.22
1969	6160	6618	17.37	24.50
1970	6229	7294	17.53	32.42
1971	5977	6476	18.27	22.51
1972	5797	6890	20.77	24.19
1973	5971	7442	21.36	33.33
1974	6113	7629	27.54	39.34
1975	5812	7673	40.71	49.5
1976	6111	8691	39.65	46.36
1977	6390	9144	42.37	48.59
1978	6360	8367	46.31	79.64
1979	6687	9950	51.45	68.12
1980	6924	10587	51.88	74.62
1981	6984	11475	58.00	100.00
1982	7223	11304	68.05	139.75
1983	7398	12414	71.08	121.23
1984	7343	10882	74.66	93.06
1985	7259	11703	81.80	100.10
1986	7403	13923	86.76	106.08
1987	7706	12016	85.89	82.38
1988	7308	12675	86.10	105.36
1989	7730	14419	94.43	174.52

1	2	3	4	5
1990	7845	14316	104.52	134.83
1991	7911	14565	119.03	107.51
1992	7878	15684	139.99	133.26
1993	8300	16157	147.53	178.74
1994	8034	15213	160.00	257.37
1995	8152	16699	188.71	344.62
1996	8194	16374	190	400
1997	8219	16853	200	423
1998	8280	17417	225	450
1999	8231	17734	250	700
2000	8349	19210	270	760
2001	8291	19320	280	800
2002	8234	19443	300	440
2003	8243	1955	310	500
2004	8543	1988	390	550
2005	8767	1966	415	500
2006	8786	1888	514	650
2007	8876	1988	523	1100
2008	9000	1991	540	1200
2009	9200	2000	567	1250
2010	9230	2100	900	1300
2011	9240	2150	1000	1400
2012	9290	2200	1100	1500

MARKETING OF WHEAT IN PAKISTAN

By

Muhammad Amin, Assistant Chief ATD

Abstract

The article outlines wheat marketing system in Pakistan and comments support price system is Pakistan. How far it benefits farming community. The farm size is reducing due to population pressure. It is the small farmer who suffers most. Government agencies procure wheat from the bulk producers. To safeguard small farmers interest it has been suggested in the article that deficiency payment may be made to them by recording quantities of transaction along with price received by the farmer. Such systems are operative in countries where support price is practiced.

1. Introduction

1.1 Wheat is planted on about 9 million hectares sharing 39 percent of cropped area. Country has been harvesting bumper crops of wheat since 2008-09. Bumper crops have put the country into export regime while it was continuously under import regime since independence. The state of self sufficiency in wheat production is a great achievement. It is based on conducive policies of the government which has put the country into green revolution and beyond. These are institutions and investment in agriculture which have put the agriculture economy of the country on the path of high growth agriculture. Agriculture depends upon land and water. We have the largest canal irrigation system in the world and range of fertile lands which are put in various crop intensities to have the optimum output per unit of land. Different crop combinations associated with wheat are wheat + cotton, wheat + basmati, wheat + IRRI, and others. Wheat is also cultivated in barani

areas. Which accounts for 13 per cent area and produces 5 per cent wheat at national level.

1.2 Harvesting of wheat takes place from April onwards each year. In Sindh wheat matures early due to climatic conditions. Marketing of wheat starts from as early as March from Sindh and continues to July onwards in Northern areas. Harvesting of wheat is done by combine harvesters, reaper and manually. Later on harvested wheat is threshed by wheat thresher. Although combine harvesters harvest wheat very quickly but it does not produce Bhoosa which is used as fodder for livestock and surplus bhoosa fetches good price as well. Due to these reasons wheat farmers prefer to go by manual harvesting to save on wheat bhoosa rather than combine harvester and reaper because manually harvested wheat produce more Bhoosa than reaper. Manual harvesting of wheat also provide employment to rural labour. But this act slows down wheat harvesting and its delivery to the markets. The price does not pick up and remains below support price. Usually in years of short supply position there is sellers market and in years of bulk supply position there is buyers market. Market disappears when the two are not present. The marketing of wheat starts right from its harvest. There are buyers at village level. It depends upon farmers obligation if he has the staying power in the market. He can dictate his terms. In case he has to pay back his loans taken from village "arhties" then he has no other alternative but to sell his produce there and then. According to the 6th Census of Agriculture more than 50 per cent of the indebted households take loan from private sources. To pay back the loan they sell the produce at through away prices. Due to this very fact such farmers are not in a position to benefit from the market price. Actually they are unperturbed with supply and demand situation. They have to dispose of their produce according to the terms and

terms and conditions settled at the time when they take loan from village "arhties". Moreover small farmers are not in a position to sell their produce in the markets. Partly because of transportation expenses including loading/unloading they have to bear and partly because to satisfy their immediate farming needs they cannot retain the produce any longer. The distress sale leads them lesser income/price from the produce which the others have taken due to better understanding of the situation and staying power in the market.

1.3 Farmers marketable surplus is based on farm area under wheat, prevailing yield levels in the wheat and finally the production obtained from the farm. Farm production is net of kind payments during the process of harvesting and threshing which are usually made in kind. Having made these payments he has to decide about his home consumption needs for the year including the feed for the livestock. He has also to make some other kind payments to the village artisans like blacksmith, woodworker, religious workers, weighman, waterman and others. After having made obligatory payments in kind he has to decide about his sale proceeds. In usual situation his sales are also obligatory as he has already pledged his produce against inputs received at the time of sowing of the crop. If he is left with any quantities to be sold in the market his first choice is the village shopkeepers and "Arhties". If he has the resources to take the produce to the market only then he can benefit from the prevailing market price subject to the produce specification and payment of respective taxes after entering in the market. Marketable surplus can be disposed of in several ways. Most usual ways are farmers selling to the consumer directly, farmers delivering to the village shopkeeper and consumers purchase from them. Other channels of wheat marketing are farmer, wholesaler, retailer and consumer. Larger channels of

wheat marketing include farmer, village shopkeeper, wholesaler, retailer and consumer, farmer, wholesaler, miller, retailer and consumer. If the produce is to be exported then the possible channel is farmer, wholesaler and exporter.

2. Administered Price

2.1 In order to have food security reserves of wheat in the country government adopts various measures. If the country is not producing enough wheat to satisfy the demand of the native population then the government has no other option but to import wheat for the hour of need as we have experienced during the past six decades. The other option is to procure wheat at the harvest time and fill the government stocks to release them at times to stabilize domestic prices.

3. Procurement Price

3.1 Procurement price is announced at the time of harvest of crop when wheat is about to harvest. The government to fill up his stocks announces such prices. In such situation farmer is at a loss as he has no option but to sell his produce at the announced price.

4. Support Price

4.1 Support price is announced before the sowing of the crop. In such a situation farmer has the option to go for wheat crop or other wise. This provides him a soft cushion to go for viable option of crop cultivation. This is how the farmer is safeguarded at the time of harvest. He has the option to sell his produce at the market price if it is over and above the existing support price. If the market prices are prevailing below the support price then the farmers choice is to go for government agencies to get the support price.

Federal government procure wheat for food security through PASSCO and provincial government through Food Departments.

5. Market Prices of Wheat

5.1 Market prices of wheat are monitored by provincial agriculture departments on regular basis in the harvest season. The analysis of 2011-12 prices is presented below:

Table Monthly Wholesale Prices of Wheat in Main Producing Area Markets of Punjab and Sindh during the Post-harvest Season of 2011-12 Crop

Markets	April	May	Average
Punjab	----- Rs per 40 kgs -----		
Lahore	1050	1039	1045
Faisalabad	1060	1021	1041
Sargodha	1000	967	984
Multan	1021	979	1000
Gujranwala	1024	1008	1016
Okara	1011	978	995
R.Y.Khan	950	975	963
Bahawalpur	1008	961	985
D.G.Khan	1017	985	1001
Average	1016	990	1003
Sindh			
Sanghar	886	890	888
Nawabshah	889	908	899
Hyderabad	878	883	881
Mirpurkhas	884	888	886
Larkana	925	925	925
Average	892	899	896

Sources: i) Directorate of Agriculture (E&M), Lahore, Punjab.
ii) DG Agriculture Extension Hyderabad, Sindh.

5.2 The table brings to fore that in Lahore and Faisalabad growers received the support price in the month of April. In other markets of Punjab and Sindh market price ruled below support price.

6. Deficiency Payments

6.1 Prima facia it appears that wheat is grown in every nook and corner of the country. Market prices provide a true picture what happens over time and space support price is announced for the benefit of the farmer. How far it has been helpful for the farmer. Wheat crop has about 50 percent marketable surplus. The government agencies procure 30 to 35 percent of the crop. The rest of the marketable surplus of 15-20 percent is transacted in open market. How the open market behaves is crystal clear. Not every farmer has access to the centres of the procurement agencies. Only the big farmers have access to dispose of their produce. Moreover it is not possible for the procurement agencies to have their presence every where as they have to procure from designated area assigned to them. It is therefore in the fitness of things that markets in the far flung areas should be well equipped with the transaction recording system. The computerized transaction is the need of the time. There should be complete record of farmers sale proceeds and the price realized by him. At the end of harvesting season farmers be compensated if they have received the price less than the prevailing support price. This is one possible way to make deficient payment to farmers. If the effort is materialized the ultimate beneficiary would be farmer. The support price system should be in the benefit of farmer in letter and spirit.

7. Wheat Procurement

7.1 Government agencies procure wheat in the harvest season to keep it for regulating market in the off season. Procurement is generally made in May-June depending upon the maturity of the crop. In Sindh the climatic conditions are conducive for maturity of wheat in March. However in Northern Areas maturity is as late as in the month of June. Provincial Food Departments procure wheat from specified designated areas. However PASSCO is federal agency which procures wheat for food security and for deficit areas and under international obligation.

7.2 For the 2012-13 wheat season Cabinet has fixed wheat procurement target of 4.5 million tonnes for the Punjab and 1.3, 0.4 and 0.11 million tonnes for Sindh, KPK and Balochistan. For the PASSCO procurement target of 1.6 million tonnes has been fixed. The procurement target adds upto 7.91 million tonnes. The procurement target is 30 percent of the anticipated wheat production of 26.3 million tonnes estimated by SUPARCO. Wheat production estimates of provincial agriculture departments add to 24.3 million tonnes.

7.3 Government releases its wheat stocks to flour mills from September onwards each year. In the intervening period mills purchase from the open market. In the pre-harvest period when the prices in the open market tend to rise the provincial food departments release their stocks to flour mills at issue price to regulate the market. The ECC of the Cabinet instructed PASSCO to off load one million tonnes wheat at reduced rate of Rs 1050/kg in the open market.

8. Storage

8.1 Storage capacity with the public sector is 4.152 million tonnes of which Punjab has 2.5 million tonnes and Sindh, KPK and Balochistan have 0.64, 0.40 and 0.181 million tonnes. PASSCO has capacity of 0.431 million tonnes. The procurement over and above is kept under open godowns at specific places. The releases of stocks is also continuous process.

9. Conclusions

1. Marketable surplus of wheat is estimated at 50 percent of the production. Government agencies procure 30-35 percent at support price. About 15-20 percent output is transacted in the open market.
2. Government agencies procure wheat to regulate supply in the off season. They also maintain food security reserves and procure wheat for honoring international commitments.
3. Support price is meant to safeguard farmers incase prices are falling below the support price.
4. In practical terms government agencies procure at support price but the market price fluctuates due to supply and demand situation.
5. It is not practicable to have the presence of government agencies every where and the farmers sell their produce below support price level.
6. It is the need of the time that in our regulated markets proper recording system of transactions be introduced in which quantity and price of every farmer be recorded. For those who receive lower price deficiency payment may be made to them.
7. This is the possible way by virtue of which farmer is protected with support price and agencies save on transportation cost and storage cost of the produce.
8. The markets of far flung areas may be given priority in this connection.

10. References

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2. *Economic Survey of Pakistan various issues.*
3. *Agricultural Statistics of Pakistan various issues*

AN OVER VIEW OF INDEBTEDNESS OF AGRICULTURAL HOUSEHOLDS

By

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Abstract

"Although the size of institutional credit is of the order of 350 billion yet the credit demand of the rural community has been partially fulfilled. This is reflective from the fact that out of 13.1 per cent indebted households in the agriculture sector more than half i.e. 7.5 per cent are served by private sector. Institutional credit is accessible to 5.6 per cent households out of which 4.6 per cent from ZTBL and one per cent from other institutional sources. Small farms have least access to credit. The size of indebtedness increases with the increase in farm size. In Sindh the incidence of indebtedness is the highest at 30.6 per cent and lowest in KPK at 9.2 per cent which may be due to smaller farm size in KPK as compared to larger farm size in Sindh. Private sector leads in credit provision in Sindh, Balochistan and KPK. In the Punjab the institutional credit is on the lead. Institutional credit other than ZTBL is mostly enjoyed by 100 acre and above farms in all the provinces except Sindh where 50 – 100 acre farms are in leading position".

1. Households under Debt

1.1 During the 6th Census of Agriculture held in 2010 question of agriculture households under debt was asked and observation regarding institutional credit i.e. ZTBL, commercial banks, designated private banks and PPCBL were recorded, non-institutional credit from NGO's, commission agents and credit taken from friends and relatives were also recorded. The information is available according to farm size with provincial break up. National and provincial level households under debt are analyzed below.

Pakistan

1.2 According to 6th Census of Agriculture, comprising rabi and kharif crops during 2010 total number of farms are estimated at 8.26 million. About 1.08 million farms are under debt. It includes both farm and non-farm credit. Non farm credit includes livestock poultry and fishery which generate exportable surplus and provides supplies to domestic markets. Separate information about non-farm credit by farm size is not available. However household availing non farm credit exceed 10 per cent of the total households under debt. About 13 per cent of the agricultural households are under debt meaning thereby 1.3 per cent of the households avail non-farm credit. As far as institutional and non-institutional credit is concerned only 5.6 per cent of the agricultural households avail institutional credit, 4.6 per cent from ZTBL and one per cent from other institutional sources. Although total institutional credit is on the rise but still not sufficient to meet the existing demand as about 7.5 per cent households take loan from non-institutional sources. It comes to fore that 57 per cent of the loan market is driven by money lenders. Partly because it is hassle free and partly because farmers lack land documents needed for institutional credit. ZTBL provides credit at subsidized rates with farmers returning loan within one year enjoy lesser mark up and thereafter slightly higher mark up but it is much less than the rate charged by other institutional sources. Mark up charged by non-institutional sources is much higher.

1.3 Farms having area less than 5 acres are 10 per cent under debt (Annex-I). Their bifurcation yields that they receive 6.9 per cent credit from private sources and 3.1 per cent from institutional sources. ZTBL provides

subsidized credit. Small farms are indebted from ZTBL to the tune of 2.4 per cent. Indebtedness of agricultural households rises with the rise in farm size, the farm size group 5 to 12.5 acres is 16.6 per cent indebted, 12.5 to 25 acres 21.3 per cent indebted, 25 – 50 acres 27.6 per cent indebted and 50 – 100 acres 29.1 per cent indebted. The overall households are 13.1 per cent indebted they receive 7.5 per cent credit from private sources, 4.6 per cent subsidized credit from ZTBL and only one per cent from other institutional sources. Highest recipient of ZTBL credit are 50 – 100 acres farms at 19.3 per cent. Highest recipient of credit from other institutional sources are farms 100 acres and above at 5.1 per cent. Meaning thereby that they are the major beneficiary of commercial credit utilization.

Khyber Pakhtunkhwa (KPK)

1.4 KPK has 1.54 million farms out of which 0.14 million are under debt, about 9.2 per cent comprising 7.3 per cent from private sources, 1.6 per cent from ZTBL and 0.3 per cent from other institutional sources (Annex-II).

1.5 Small size farm group having 5 acres of land is indebted to the tune of 8.9 per cent. Meaning thereby that 91 per cent of the small households has no access to credit. Of the total small households 7.3 per cent are under debt of private sector, 1.4 per cent of ZTBL and 0.2 per cent of other institutional sources. Incidence of indebtedness increases with the increase in farm size. The 5 to 12.5 acres farms are 10.4 per cent indebted, 12.5 to 25 acres 10.8 per cent, 25 – 50 acres 10.7 per cent and 50 – 100 acres 14.4 per cent. In the 100 acres and above group the incidence of indebtedness decreases to 11.3 per cent. This is the same pattern of indebtedness as observed at country level. The highest farm size group enjoys maximum credit from ZTBL at 6.6 per cent and other institutional sources at 2.5 per cent. The non institutional

credit has been utilized maximum at 8.7 per cent by 50 – 100 acres farm size group.

Punjab

1.6 Punjab has 5.25 million farms out of which 0.54 million are indebted meaning thereby that only 10.2 per cent households receive credit from different sources (Annex-III). Punjab farmers are 5.1 per cent indebted from ZTBL, 0.9 per cent from other institutional sources and 4.2 per cent from private sources including friends, relatives, commission agents and NGO's. Analysis of indebtedness by farm size group yields that small farms in the Punjab are the lowest recipient of credit at 7 per cent only which is below the national level estimate of 10 per cent. Their indebtedness is composed of 4 per cent from private sources, 2.5 per cent from ZTBL and 0.5 per cent from other institutional sources. Indebtedness of farm households rises with rise in farm size. For the successive farm size groups it rises to 14, 19, 26, 30 and 40 per cent, respectively and averages at 10.2 per cent for overall indebtedness of the Punjab farmers. In the Punjab the 100 acres and above households are maximum beneficiaries of ZTBL credit at 27.2 per cent and also for other institutional credit at 11.4 per cent. They receive only 1.8 per cent credit from private sources. Overall these households are 40 per cent indebted. At province level agricultural households take 5.1 per cent credit from ZTBL, 0.9 per cent from other institutional sources and 4.2 per cent from private sources. Adding upto 10.2 per cent from all available sources when compared with country estimates Punjab households are 3 per cent less indebted, receive more credit from institutional sources but less indebted from private sources.

Sindh

1.7 Sindh has 1.12 million farms out of which 0.34 million are indebted (Annex-IV), about 31 per cent of the total farms. The incidence of indebtedness is much higher from private sources at 20.5 per cent. Total institutional credit is estimated at 10.1 per cent, 7.8 per cent from ZTBL and 2.3 per cent from other institutional sources. In Sindh the rate of indebtedness is high on overall basis and institutional and non-institutional basis.

1.8 Small farms having less than 5 acres are 27.6 per cent indebted. Most of credit comes from private sector at 21.6 per cent. Institutional credit account for 6 per cent comprising 3.8 per cent from ZTBL and 2.2 per cent from the commercial banking sector including micro finance institutions. The incidence of indebtedness is the highest when compared with other provinces as well as national level. Credit from institutional and non-institutional sources also exceeds in this province.

1.9 Sindh follows the pattern of country as a whole i.e. indebtedness of farms rises with the rise in farm size except the 100 acres and above farm where it decreases from the 50 – 100 acres group. All the farm size groups in Sindh have higher level of indebtedness as compared to other provinces except the 100 acres and above farms which exceed in case of Punjab. Farmers having 5 – 12.5 acres of land are the prime users of private credit at 23.4 per cent. Farm size group of 50 – 100 acres enjoys 35 per cent institutional credit, 30.7 per cent from ZTBL and 4.3 per cent from other institutional sources. Farms in Sindh are typically more indebted due to active private sector as compared to other provinces.

Balochistan

1.10 Balochistan has 0.35 million farms out of which 0.063 million are indebted about 18 per cent are indebted (Annex-V). Private sector leads in provision of debt to the farming community by providing 15.7 per cent out of 18 per cent. The other institutional sources including ZTBL account for 2.3 per cent. The small size farms are less indebted at 16 per cent as compared to the overall average of 18 per cent. Indebtedness increases with the increase in farm size as 5 – 12.5 acre farms are 17.6 per cent indebted and 12.5 to 25 acre farms are 22 per cent indebted. In other farm sizes it reduces marginally and again picks up at 100 acre and above farms. Highest beneficiary of private credit is 18.4 per cent for 12.5 to 25 acre farm, ZTBL at 7.5 per cent of 50 to 100 acre farms and 3.1 per cent from other institutional sources for 100 acre and above farms.

1.11 Farm indebtedness is the highest in Sindh at 31 per cent followed by Balochistan at 18 per cent, Punjab 10 per cent and KPK 9 per cent with overall indebtedness at country level 13 per cent. Private sector leads in providing credit to the farming community in Sindh at 21 per cent followed by Balochistan 16 per cent, KPK 7 per cent and Punjab 4 per cent with overall private sector share at country level 8 per cent. As far as institutional credit is concerned Sindh again leads at 10 per cent with 7.8 per cent ZTBL credit and 2.3 per cent other institutional credit. KPK is the least beneficiary of institutional credit at 2.3 per cent with 1.2 per cent ZTBL facility. At country level overall institutional credit is 5.6 per cent.

2. Composition of Farms Under Debt

Pakistan

2.1 Farm size is reducing due to inheritance and population pressure as about 6.5 per cent of farms are under 5 acres and 2.5 per cent are between 5 to 12.5 acres.

Table-1: Share of farms by Farm Size and Farms under Debt in Pakistan

Farm size	Total	Under debt
5	64.7	49.8
5 – 12.5	24.8	31.4
12.5 – 25	6.8	11.1
25 – 50	2.6	5.4
50 – 100	0.8	1.8
100 and above	0.3	0.6

Source: Pakistan Census of Agriculture 2010.

2.2 Meaning thereby that there are only 10 per cent farms at country level which are 12.5 acres and above. As far as indebtedness of farms is concerned farms having less than 5 acres are 65 per cent but their access to credit from all sources is just 50 per cent. Of the total indebted farms 31.4 per cent are 5 – 12.5 acres, 11.1 per cent are from 12.5 to 25 acres, 5.4 per cent are from 25 – 50 acres, 1.8 per cent are from 50 – 100 acres and 0.6 per cent are from 100 acres and above. Prima facia it comes to fore that as farm size increases the share of indebtedness exceeds the share of it in total farms except the small farm size group where it is 15 per cent less.

Khyber Pakhtunkhwa (KPK)

2.3 In KPK farm size is extremely small as compared to other provinces. About 81 per cent of the farms are having area below 5 acres and 14 per cent are between 5 to 12.5 acres.

Table-2: Share of Farms by Farm Size and Farms under debt in KPK

Farm size	Total	Under debt
5	80.8	77.9
5 – 12.5	14.3	16.2
12.5 – 25	3.2	3.8
25 – 50	1.2	1.4
50 – 100	0.3	0.5
100 and above	0.12	0.14

Source: Pakistan Census of Agriculture 2010.

2.4 There are only 5 per cent farms which are 12.5 acres and above. As far as indebtedness of the farms is concerned the small farms receive share of 78 per cent against their 81 per cent share in total farms. The all other categories of farms share credit over and above their credit in total farm categories. The small farms indebtedness tells the same story as is given in national scenario but the gap between the two is narrow.

Punjab

2.5 Farm size in the Punjab is close to the national level size of farm. Despite Punjab occupies lions share in total farm area of the country, about 64 per cent of the total farms are small in the Punjab.

Table-3: Share of Farms by Farm Size and Farms under debt in Punjab

Farm size	Total	Under debt
5	63.8	43.3
5 – 12.5	26.9	36.7
12.5 – 25	6.9	12.8
25 – 50	1.8	4.7
50 – 100	0.5	1.4
100 and above	0.2	0.7

Source: Pakistan Census of Agriculture 2010.

2.6 They receive 44 per cent of the farm credit within Punjab, a yawning gap of 20 per cent. From 5 to 50 acres the share of indebtedness is higher as compared to share of total farms. In the 50 – 100 acre category both the shares are at par. However, in the 100 acre and above category the share of indebtedness exceeds.

Sindh

2.7 Farm size in Sindh is comparatively higher as compared to Punjab and KPK. Small size farms are only 56 per cent and 5 – 12.5 acre farms are 27 per cent.

Table-4: Share of Farms by Farm Size and Farms under debt in Sindh

Farm size	Total	Under debt
5	56.4	50.9
5 – 12.5	26.7	29.0
12.5 – 25	8.8	9.8
25 – 50	5.8	7.3
50 – 100	1.9	2.4
100 and above	0.5	0.6

Source: Pakistan Census of Agriculture 2010.

2.8 The higher farm size categories share 17 per cent. The general pattern of rise in indebtedness with the rise in farm size is prevalent. Small farms share in indebtedness is less as compared to their share in total farms. However the gap is not large.

Balochistan

2.9 The distribution of farm size in Balochistan is quite different and average farm size is higher. There are only 37 per cent farms having area less than 5 acres.

Table-5: Share of Farms by Farm Size and Farms under debt in Balochistan

Farm size	Total	Under debt
5	36.6	32.7
5 – 12.5	33.4	32.8
12.5 – 25	15.5	18.9
25 – 50	9.1	9.9
50 – 100	4.4	4.5
100 and above	1.1	1.2

Source: Pakistan Census of Agriculture 2010.

2.10 Farms having area 5 to 12.5 acres are 33 per cent. About 16 per cent farms have area 12.5 to 25 acres. Farms having area 25 acres and above are 14 per cent compared to 4 per cent at national level. As far as indebtedness is concerned farms having area less than 12.5 acres share 70 per cent higher than their share in indebtedness of 66 per cent. The other farms size categories fall on the same pattern of rise in farm size and rise indebtedness.

3. Conclusions

1. Only 13 per cent of the agricultural households are indebted. About 7.5 per cent take loan from friends relative and NGO's, 4.6 per cent avail credit of ZTBL and one per cent from other institutional sources.
2. About 31 per cent of the farms in Sindh are indebted, private sector leads in loaning the farming community by providing 20.5 per cent credit, ZTBL 7.8 per cent and 2.3 per cent by other institutional sources.
3. Balochistan has the second highest indebtedness at 18 per cent. Loan share provided by private sector is at 15.7 per cent, followed by ZTBL 1.2 per cent and other institutional sources at 1.1 per cent.
4. In the Punjab 10.2 per cent agricultural household are indebted, ZTBL takes the lead with 5.1 percent, private sector 4.2 per cent and other institutional sources 0.9 per cent.
5. KPK has lesser share of indebted households at 9.2 per cent. Bulk of the credit is supplied by the private sector at 7.3 per cent. ZTBL provides 1.6 per cent credit and only 0.3 per cent by other financial institutions.
6. Farms having less than 5 acres receive the least credit as compared to their share in total farms.
7. The incidence of indebtedness increases with the increase in farm size.
8. The indebtedness in Balochistan is highest in farm having area 12.5 acres and above.
9. The share of indebtedness is the highest in KPK for small farms and least for Balochistan farm.

4. References:

1. Pakistan Census of Agriculture 2010.
2. Reports of Agriculture Credit Department, State Bank of Pakistan.
3. Agriculture Statistics of Pakistan - Various issues.
4. Economic Survey of Pakistan - Various issues.

Annex-I

Farm Under Debt in Pakistan: 2010

Farm Size	ZTBL	CB	Total farms under debt	Total Farm	ZTBL	CB	Private sources	Total farms under debt
	----- Number of Farms -----				----- Per cent -----			
5	125770	35085	538619	5350910	2.4	0.7	6.9	1
5 - 12.5	142194	24929	339531	2047190	6.9	1.2	8.5	16.6
12.5 - 25	63417	10441	1196411	562206	11.3	1.9	8.1	21.3
25 - 50	34231	5554	58226	211198	16.2	2.6	8.8	27.6
50 - 100	12900	2695	19492	66927	19.3	4	5.8	29.1
100 & above	3812	1333	6409	26100	14.6	5.1	4.9	24.6
Total	382320	80042	1081907	8264480	4.6	1	7.5	13.1

Source: Pakistan Census of Agriculture 2010.

Annex-II

Farm Under Debt in Khyber PakhtoonKhawa: 2010

Farm Size	ZTBL	CB	Total farms under debt	Total Farm	ZTBL	CB	Private sources	Total farms under debt
	----- Number of Farms -----				----- Per cent -----			
5	17233	2341	110240	1244563	1.4	0.2	7.3	8.9
5-12.5	4955	987	22988	220394	2.2	0.4	7.8	10.4
12.5-25	1774	784	5355	49634	3.6	1.6	5.6	10.8
25-50	595	89	1947	18234	3.3	0.5	6.9	10.7
50-100	208	88	752	5227	4	1.7	8.7	14.4
100 & above	118	45	202	1790	6.6	2.5	2.2	11.3
Total	24882	4337	141493	1539829	1.6	0.3	7.3	9.2

Source: Pakistan Census of Agriculture 2010.

Annex-III

Farm Under Debt in Punjab: 2010

Farm Size	ZTBL	CB	Total farms under debt	Total Farm	ZTBL	CB	Private sources	Total farms under debt
	----- Number of Farms -----				----- Per cent -----			
5	84181	18068	234088	3347496	2.5	0.5	4	7
5-12.5	113673	16546	196901	1411353	8.1	1.2	4.7	14
12.5-25	44574	6682	68818	360467	12.4	1.9	4.8	19.1
25-50	16643	3008	24970	96679	17.2	3.1	5.5	25.8
50-100	5060	1388	7521	25062	20.2	5.5	4.3	30
100 & above	2386	999	3542	8771	27.2	11.4	1.8	40.4
Total	266527	46695	535818	5249804	5.1	0.9	4.2	10.2

Source: Pakistan Census of Agriculture 2010.

Annex-IV

Farm Under Debt in Sindh: 2010

Farm Size	ZTBL	CB	Total farms under debt	Total Farm	ZTBL	CB	Private sources	Total farms under debt
	----- Number of Farms -----				----- Per cent -----			
5	24064	13533	173540	629427	3.8	2.2	21.6	27.6
5 - 12.5	22813	6253	98801	297315	7.7	2.1	23.4	33.2
12.5 - 25	15940	2183	33492	97681	16.3	2.2	15.8	34.3
25 - 50	16076	2213	25039	64189	25	3.4	10.6	39
50 - 100	6470	915	8347	21102	30.7	4.3	4.6	39.6
100 & above	1198	174	1914	5575	21.5	3.1	9.7	34.3
Total	86546	25269	341141	1115285	7.8	2.3	20.5	30.6

Source: Pakistan Census of Agriculture 2010.

Farm Under Debt in Balochistan: 2010

Farm Size	ZTBL	CB	Total farms under debt	Total Farm	ZTBL	CB	Private sources	Total farms under debt
	----- Number of Farms -----				----- Per cent -----			
5	292	1143	20751	129424	0.2	0.9	14.9	16
5 - 12.5	753	1143	20841	118128	0.6	1	16	17.6
12.5 - 25	1129	792	11976	54424	2.1	1.5	18.4	22
25 - 50	917	244	6270	32096	2.9	0.8	15.8	19.5
50 - 100	1162	304	2872	15536	7.5	2	9	18.5
100 & above	110	115	751	3745	2.9	3.1	14.1	20.1
Total	4365	3741	63455	353353	1.2	1.1	15.7	18

Source: Pakistan Census of Agriculture 2010.