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Analyzing the Performance of Agriculture Sub-Sector in the Growth Rate of Agriculture GDP

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ABSTRACT

This research focused on the agricultural sub-sectors share in agriculture GDP in Pakistan. The research is based on secondary data and research has taken 66 years past data from the economic survey of Pakistan and the period is (1950-2015). The study is conducted with an Ordinary Least Square (OLS) on a sample and five variables (major, minor crops, livestock, fishing, and forestry). Agriculture GDP has been considered as a dependent variable to identify its relationship with independent variables (major, minor crops, livestock fishing and forestry). The outcomes of the research show that agricultural sub-sectors contribute positively and significantly in the agriculture GDP. However, forestry sub-sector had a predictable sign but the share in growth is lower than subsectors. The results of research recommend that the Government of Pakistan has to take considerable steps towards increasing the growth of overall agricultural GDP. This would include introducing new technology, lessening the amounts of agri-based goods, and giving interest free loans to farmers.

***Keywords*:** Crops, Livestock, Forestry, Agriculture GDP, Pakistan

INTRODUCTION

Pakistan has an abundant resource of cultivatable land. Agriculture is a backbone of Pakistan economy as it is a source of food and raw material to industries, foreign exchange earnings assistances in poverty elimination (M. A. Iqbal, 2015). The economy of Pakistan is based on agriculture since independence but its performance is falling due to political and climate conditions (Tariq, 2014). The agricultural segment is the second largest segment of Pakistan share to the gross domestic product (GDP). The whole agricultural sector of Pakistan contributes approximately 21.4% to the GDP (GOP, 2015). About two-thirds of Pakistan's population is directly or indirectly dependent on agriculture (Begum & Yasmeen, 2011). There are more than 22.22 million farming hectares and the size of the agricultural economy is more than Rs.30 trillion (GOP, 2015).

The United Nations Organization (2008) assessed that over 50% of the world's population is indirectly or directly involved in agriculture as a means to make a living. In Pakistan, the agricultural sector is the key source of earning for rural families. Nearly 68% of the labor force and 80% of the population was directly or indirectly engaged with the agricultural sector (Ahmad, 2011). The agricultural sector of Pakistan can achieve increased productivity by using modern techniques of farming, leading-edge technology, certified seed, pesticide and fertilizer (Hamid & Ahmad, 2009). Availability of credit at opportune times can help the farmer to purchase agricultural inputs and also help to reduce poverty (Saboor, Hussain, & Munir, 2009). The role of agriculture in GDP was 4.0% in 2013-2014 which increased to 4.2% in the year 2014-2015. In the year 2014-2015 the growth rate of the agricultural sector was 2.9% (GOP, 2015). Agriculture consists of four sub-sectors: livestock, forestry, major and minor crops.

The agricultural mix of Pakistan is deeply founded on chief crops (wheat, rice, sugarcane, maize, and cotton) which add 23.55% in overall agriculture and 4.67 % in GDP of Pakistan (GOP, 2015). The economy of Pakistan depends heavily on cotton crops. The cotton crop is a primary raw material for the Pakistani textile manufacturing. The cotton crops enable the textile manufacturing to continue and develop its base (M. A. Iqbal et al., 2015). Cotton contributes 1.0 % to total GDP of Pakistan (GOP, 2015). Wheat is a staple food of Pakistan and wheat crops contribute 2 % of the GDP. The second main food source wheat after is rice and this is the most important source of foreign exchange earnings (Abdullah, 2015). Rice crops add 0.6% to the GDP of Pakistan (GOP, 2015). Sugarcane is very important for sugar and resources to drive the sugar industry (Sharif, 2014). Sugarcane and maize account for 0.6 % and 0.4% of the overall GDP (GOP, 2015).

***H2a**: Major Crops are correlated with the agricultural GDP of Pakistan*

***H2b**: Major Crops have a significant influence on the agricultural GDP of Pakistan*

Minor crops consist of oilseeds, mash, masoor, bajra, jowar, tobacco, potatoes, chilies etc. The major oilseed crops grown in Pakistan consist of canola, mustard, sunflower, and cotton (Syed Ali Raza, 2012). Minor crops contribute 2.3% towards the overall GDP (GOP, 2015). Weather variations are disturbing the production and growth of minor crops. Minor crops are used in many herbal medicines (Sher &

Yousaf, 2014). Minor crops are also a resource for earning foreign exchange.

***H1a**: Minor Crops are positively correlated with the agricultural GDP of Pakistan*

***H1b**: Minor Crops have significant influence on the agricultural GDP of Pakistan*

Livestock is a sub-sector of the agriculture sector. This sector includes buffalos, cows, cattle, goats, sheep, poultry, camels, asses, and horses (Abedullah, Khalid, & Kouser, 2009). Livestock plays a pivotal part in the rural socio-economic progress of Pakistan as well as poverty reduction (Hayat, 2017). Livestock contributed 11.8% solely in the GDP between 2014 and 2015 (GOP, 2015). Population growth, urbanization, changing eating patterns and export opportunities are driving the need for livestock in the country. Increased production cost is increasing the price of milk, meat, yogurt etc. In the livestock sector, over 8.0 million country dwellers/farmers are involved in raising livestock.

***H3a**: Livestock is correlated with the agricultural GDP of Pakistan*

***H3b**: Livestock has a significant influence on the agricultural GDP of Pakistan*

Pakistan abounds natural resources and the 21st largest river Indus is a precious asset, which ascends from Tibetan Plateau and descends to Arabian Sea. Fishery sector largely depends on water resources. Due to water shortage population of some of the fish species are at the verge of extinction. Fisheries sector contributes 0.41% to the agricultural GDP (GOP, 2015). Fisheries in lakes and rivers represent over 80 % of entire domestic fish production. Data on inland fisheries are poor and much of the catch and consumption locally is never reported.

***H4a**: Fishing is correlated with the agricultural GDP of Pakistan*

***H4b**: Fishing has a significant influence on the agricultural GDP of Pakistan*

Along with Livestock and Fishery, Forestry is also a sub-sector of agriculture. Forestry also plays a significant part in economic development, maintenance of biodiversity, environmental quality and protection of watersheds (Sajjad, Adnan, & Hussain, 2016). Forest also played important roles in soil nutrient absorption and contributes to the gas regulating through their functions as carbon sinks (Ahmad & Nizami, 2015). The forestry sector contributes 2.06 % to agricultural value addition and 0.41 % to the total GDP of Pakistan (GOP, 2015).

***H5a**: Forestry is correlated with the agricultural GDP of Pakistan*

***H5b**: Forestry has a significant influence on the agricultural GDP of Pakistan*

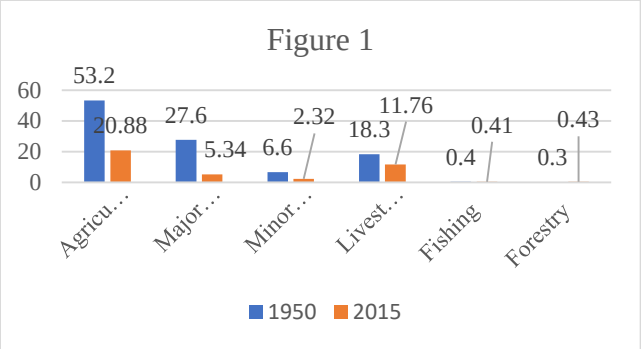

Figure 1: Sectorial Growth Comparison

The agriculture sector of Pakistan contributes less to the economy than more developed countries of the world. This sector of Pakistan is facing a lot of challenges such as harsh weather; modern technology; old harvesting techniques; accessibility of water; small land holding; shortage of energy; increasing prices of agricultural inputs such as seed, fertilizer, and pesticide (Shahbaz, Ali, Khan, & Ahmad, 2010).

The growth of the agricultural sector is important for economic development. Agriculture productivity is dependent upon modern and expensive agricultural inputs like fertilizers, tube-wells, seeds, pesticides, veterinary services, institutional credit education and training facilities (Ali & Chaudhry, 2015; Faridi, Chaudhry, & Tahir, 2015).

Furthermore, to our information there is no time series research with data of 66 years has been directed until now to examine the source of growth in agriculture GDP by sub sectors. Hence, this research overcomes earlier researches by directing a more wide-ranging examination, taking all sectors in the economy along with employing two influential methods for economic analysis.

This investigation is mainly valuable for the economist, policymakers, government, investors, agrarian concerns, scholars and educators to recognize the definite presentation of agriculture over the economic progress in the sectarian base. In the end, recommendation will be helpful to deal with the difficulties that these sub-sectors opposite in present state.

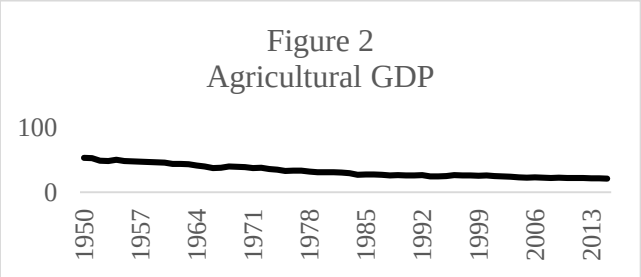

***Figure 2*:** Agriculture Growth

LITERATURE REVIEW

Many researchers have investigated the performance of the agriculture sector. Syed Ali Raza et al. (2012) conducted research on the agricultural sector of the GDP in Pakistan. They used secondary data from the years 1980-2010 and applied simple regression to find a link

between the sub-sector of agriculture and the GDP and reported a positive and significant link between agriculture sector and GDP of Pakistan. The growth and development of the agriculture sector are vital and it depends on the policies of government (Abdullah, 2015). The agricultural sector supplies raw materials to industries and fuels the growth of the industry which, in turn, contributes to the GDP (Ershad, Ali, 2010). The government has to balance industrial and agricultural policies to ensure stable and steady growth and development.

Abedullah, (2009) directed a study to determine the effects of credit on the progress of livestock. They reported that credit availability can double the size of economy related to livestock. Livestock offers employment opportunities for the unemployed population of Pakistan. (Ahmad, 2011) studied the influence of credit on farming productivity using data from the years 1974 to 2008. The results indicated the positive impact of credit supply on agricultural productivity. Credit facility supports the growers to purchase up-to-date and expensive inputs such as the tractor, tube well, seeds, fertilizers.

Muhammad-Lawal and Atte (2006) conducted research in the economic sectors of Nigeria. Applied statistical tests were used to analyze agricultural production and stated that the productivity of the agricultural sector can increase by using technology in the production agricultural products. Major crops (sugarcane, rice, maize wheat and cotton) contribute more to the GDP than other sub-sectors of agriculture. The production of major crops can be improved by using modern methods of farming (Rehman, 2015). Raza (2012) investigated the agriculture growth by means of time series data. The result of the research shows the positive role of agricultural sub-sectors except the forestry sub-sector in connection with GDP.

Olajide, Akinlabi, and Tijani (2012) studied the link between agricultural means and GDP growth in Nigeria. This study used the agricultural data between 1970 and 2010 and the Ordinary Least Squares (OLS) method. The results of a study show that the agriculture and GDP growth percentages are linked.

Nazish, Iqbal, and Ramzan (2013) analyzed the effect of agriculture segment on the GDP yearly progress of Pakistan. For the purpose of the study, the statistics were collected for 31 years. The outcomes of the investigation indicate that farming segment is more vital than other segments of the economy for Pakistan.

Another researcher Usman (2016) conducted research on the involvement of agriculture sector in the GDP growth proportion of Pakistan. The author collected the data for the research from the secondary sources and employed time series data from 1990-2014. For qualifying the fallouts, author fit the regression model for this research. Though, regression fallouts presented that there is a significant part of agriculture sub sectors towards the economic growth. The results of the study claimed that livestock is also the major portion of agriculture and has significant influence in the agriculture sector.

The conclusions of the literature review proposed that agriculture is important for the GDP growth of Pakistan. Agriculture is an important sector of Pakistan, providing employment, food and foreign exchange earnings. Therefore, the current research is directed concerning exploring sector-wise share in agriculture GDP of Pakistan during the period of 1950 to 2015, using Person Correlation and Ordinary Least Square (OLS) econometric techniques.

Pakistan is taking a hard step to be an advanced country GDP, it is useful that the country has high productivity in the production processes of all sectors. Due to the high share of the transportation, communication and the financial sub-sectors to the overall economy, these sub-sectors of agriculture are regarded as stimulants to the total growth. Hence, the objective of the study is to determine the growth of productivity of these sub-sectors with the large sample size. To check the relationship between agricultural sub sector contribution and agriculture GDP of Pakistan.

RESEARCH METHODOLOGY

The secondary data was a source used in the research. The time perspective in this study is consisting of an average of fifty-six years and includes the years 1950 - 2015. The statistics for the research were obtained from the Economic Survey of Pakistan which was conducted by Government of Pakistan. The software used to carry out the testing was SPSS 23. As panel data is decided to be used in studying the regression model, there will have 56 observations in this study.

A study model was established with the intention to empirically examine the effect of agricultural subsector on agricultural GDP of Pakistan. The model for research was adopted from the previous studies and they applied correlation analysis and an Ordinary Least Square (OLS) regression analysis investigates the connection between variables (Chandio, 2015; Raza, 2012; Usman, 2016). In the model, agricultural GDP is the dependent variable and major crops, minor crops, livestock, fishery, and forestry are the independent variables.

The statistical formulation of the model can be presented as follows:

$$Y=f\ (AGRICULTURE\ GDP,\ MAJOR\ CROPS,\ MINOR\ CROPS,\ LIVESTOCK,\ FISHING\ FORESTRY)$$

To test hypothesis empirically model can be specified as follows

$$Y = \beta 0 + \beta 1\ MAJORCROPS + \beta 2\ MINORCROPS + \beta 3\ LIVESTOCK + \beta 4\ FISHING + \beta 5\ FORESTRY + \mu$$

Definition of Variables

Y=Agriculture GDP (yearly share %).
MAJORCROPS = Major crops share in agriculture GDP (%).
MINORCROPS = Minor crops share in agriculture GDP (%)
LIVESTOCK = Livestock share in agriculture GDP (%).
FISHING = Fishing share in agriculture GDP (%).
FORESTRY = Forestry share in agriculture GDP (%).

RESULTS AND DISCUSSIONS

The descriptive analysis helps to know and current aspects about the sample by means of numerical measures for example mean, mode, and median (Hall, 2011). The outcomes of descriptive analysis of this study were accessible in Table 1. The summary of descriptive analysis holds the Maximum, Minimum, Standard deviation, and Mean.

Table 1 demonstrates the mean/average value of agricultural GDP, major crops, minor crops, livestock, fishing and forestry 32.4497, 15.4194, 4.47485, 11.6026, 0.54682 and 0.29636 respectively. The results of standard deviation of the study variables were from 9.54272, 6.72793, 1.08447, 3.45264, 0.29418, and 0.16341 respectively.

Table 1

Descriptive Statistics

	Mean	Min	Max	Std. Dev
Agri GDP	32.449	20.88	53.2	9.542
Major Crops	15.419	5.33	27.6	6.727
Minor Crops	4.474	2.32	7	1.084
Livestock	11.602	7.5	19	3.452
Fishing	0.546	0.2	1.1	0.294
Forestry	0.296	0.1	0.7	0.163

Table 2

Pearson's Correlation

Factors	Agriculture GDP	Major Crops	Minor Crops	Livestock	Fishing	Forestry
Agri GDP	1					
Major Crops	.948**	1				
Minor Crops	.801**	.796**	1			
Livestock	.761**	.528**	.413**	1		
Fishing	-.425**	-.32*	0.100	-.639**	1	
Forestry	-.530**	-.67**	-.61**	-0.031	-0.078	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows the projected outcomes of Pearson's correlation examination. The outcomes indicate that there was a strong positive correlation between the agricultural sub-sectors. This suggests that growth in the share of these sub-sectors will lead towards growth in the agricultural GDP. While the correlation exists among agriculture and its subsectors, for example major crops, minor crops and livestock. Fishing has a negative relation with agricultural GDP, major crops, and livestock. Forestry has no relation to the subsectors of Agriculture. The results of table number two prove the hypothesis. Ha1, Ha2 Ha3, Ha4, and Ha5.

Multicollinearity Test

According to Gujarati (2009), multicollinearity problem arises when there is linear relationship between some or all independent variables in the regression model. The existing of the problem indicates that there is high inter correlation among the independent variables. The range of VIF is between one to infinity. A VIF value that is greater than 10 indicates that there is serious multicollinearity problem on the variable, while VIF value that is lowers than 10 shows the opposite.

Many references for suitable levels of tolerance have been available in the previous literature. As stated by Tabachnick, (2001), the minimum level of tolerance suggested is a value of 0.10.

Table 3

Collinearity Statistics

	Tolerance(1/VIF)	VIF
Major Crops	0.138	7.255
Minor Crops	0.150	6.659
Livestock	0.287	3.484
Fishing	0.244	4.105
Forestry	0.378	2.644

Regression Analysis

The equation for this model was:

Agri GDP = β0 + β1 MAJORCROPS + β2 MINORCROPS + β3 LIVESTOCK + β4 FISHING + β5 FORESTRY + μ

Agri GDP = 0.168 + 0.967 + 0.929 + 1.039 + 0.951 + 0.623 + μ

Table 4

Coefficients

Variables	B	t	Sig
Major crops	0.968	127.155	0.000
Minor crops	0.930	20.5444	0.000
Livestock	1.039	101.102	0.000
Fishing	0.951	7.265	0.000
Forestry	0.623	3.294	0.002

Table number four explains the regression analysis which was applied to reveal the results. The outcomes of regression examination show that all sub sectors of agriculture have an impact on the agricultural GDP. The results show that of major crops, minor crops, livestock, fishing, and forestry were significant at 1 % probability.

The results of regression displayed that hypotheses Hb1, Hb2, Hb3 Hb4 and Hb5 were accepted because Sig value of P is more than 0.05. The coefficient value of major crops shows that 1% growth in share can increase by 0.96% of agriculture GDP. However, the coefficient value of minor crops shows that 1% growth in share can rise 0.93% of agriculture GDP. Furthermore, the coefficient value of livestock shows that 1.03% growth in share can increase by 1 % of agriculture GDP. Moreover, the coefficient value of fishing and forestry sector displays that 0.95% and 0.63% growth in part can increase by 1 % of agriculture GDP.

The all agricultural sub sectors have a positive impact on the growth of agricultural GDP and the results are consistent with previous research which was conducted by Zaheer et al. (2013). Result suggests that fisheries and forestry have low involvement due to several reasons, main reasons involved little investment strength in this sector, inadequate accommodations, inexpert and unskilled workforce involved with it. The results are not in line with previous findings from Chandio et al. (2015); Raza (2012); Usman (2016), stating that forestry has an insignificant relationship with the agricultural GDP.

Table 5

Regression Results

R	R Square	Adj. R Square	Std. Error	F
.999a	0.999	0.999	0.153	240.647

Dependent Variable: Agriculture GDP

The table five of this study exhibits the model summary in which the value of R is .999 which means that there is a solid correlation between dependent and independent variables.

The value of R squared is 0.999 and stated that model appropriate.

Table four indicates that F significance is 0.000 which is less than 0.05 demonstrating that all independent variables of this research successfully illustrate the dependent variable. The goal of this research is to explore the influence of the sub sector of agriculture on agricultural GDP. The results of regression show that two hypotheses were proved to have Sig value less than 0.05.

CONCLUSIONS

The aim of the research was to examine the sector by sector stake in growth and development of agricultural GDP in Pakistan for the years 1950 to 2015. The Pearson correlation statistical method was applied and results stated that agricultural GDP correlates with the sub-sectors of agriculture which are used in this study.

Ordinary Least Square (OLS) valuation method was used to display the connection among the independent variables (major crops, minor crops, livestock, fishing, and forestry) and the dependent variable (Agriculture GDP). The conclusion of OLS analysis shows that major crops, minor crops, livestock, fishing and forestry significantly contribute to the agricultural GDP with a coefficient of 0.967, 0.929, 1.039, 0.951, and 0.623 separately. The examination revealed that all hypotheses and results acknowledged, confirm that the agricultural sub-sectors portion significantly contributes to agriculture GDP in Pakistan.

The conclusion of research recommends that the Administration of Pakistan has to take considerable steps towards increasing the growth of overall agricultural GDP. This would include introducing new technology, lessening the amounts of agri-based goods, improvement of water availability and giving interest free loans to farmers. Evolving skills and abilities of workers and expansion in the agriculture sector is crucial for the longstanding advance of the sector.

REFERENCES

Abdullah, M., Li, J., Ghazanfar, S., Ahmed, J., Khan, I., & Ishaq, M. N. (2015). Where Pakistan Stands Among Top Rice Exporting Countries, an Analysis of Competitiveness. *Journal of Northeast Agricultural University (English Edition)*, 22 (2), 80-86.

Abedullah, N., Khalid, M., & Kouser, S. (2009). The role of agricultural credit in the growth of livestock sector: A case study of Faisalabad. Pakistan *Pakistan veterinary journal*, 29 (2), 81-84.

Ahmad, A., & Nizami, S. M. (2015). Carbon stocks of different land uses in the Kumrat valley, Hindu Kush Region of Pakistan. *Journal of forestry research*, 26 (1), 57-64.

Ali, S. and Chaudhry, IS (2015). An empirical analysis of poverty alleviation through livestock development in Pakistan. *The Dialogue*, 10 (2), 132-150.

Ahmad, H. K. (2011). Pakistan productivity profile 1965-2005: AuthorHouse.

Ahmad, N. (2011). Impact of institutional credit on agricultural output: A case study of Pakistan. *Theoretical and Applied Economics*, 10 (10), 99.

Ali, E. (2010). Agricultural Trade Liberalisation and Economic Growth in Developing Countries: Analysis of Distributional Consequences. *The estey centre Journal of International Law and Trade Policy*, 11 (2), 371.

Begum, R., & Yasmeen, G. (2011). Contribution of Pakistani women in agriculture: productivity and constraints. *Sarhad Journal Agriculture*, 27(4), 637-643.

Chandio, A. A., Yuansheng, J., Rahman, T., Khan, M. N., Guangshun, X., & Zhi, Z. (2015). Analysis of agricultural subsectors contribution growth rate in the agriculture GDP growth rate of Pakistan. *International Journal of Humanities and Social Science Invention*, *4*(8), 101-105.

Gujarati, D. N. (2009). Basic econometrics: Tata McGraw-Hill Education.

Govt.of Pakistan. (2015-16).Economic Surevy of Paksitan. Minstry of Finance, Economic Advisor's Wing, Ialambad, Pakistan Retrieved from http://www.finance.gov.pk

Hamid, A., & Ahmad, H. K. (2009). Growth and Productivity in Purview of Transitional Dynamics in Pakistan Agriculture Sector. Pakistan Economic and Social Review, 29 (1) 49-78.

Hayat, Z., Luqman, M., Nasir, S., Ashraf, E., Shahbaz, B., & Iqbal, Z. (2017). Constraints to Livestock Production in the Punjab, Pakistan: A Case Study of District Sargodha. *Journal of Agriculture Research*, 55 (1), 211-222.

Iqbal, A. (2013). Impact of Agriculture, Manufacturing and Service Industry on the GDP Growth of Pakistan growth rate of Pakistan. *International Journal of Humanities and Social Science Invention*, 4 (8), 101-105.

Iqbal, M. A., Iqbal, A., Afzal, S., Akbar, N., Abbas, R. N., & Khan, H. Z. (2015). In Pakistan, agricultural mechanization status and future prospects. *American-Eurasian Journal Agriculture Environment Science*, 15 (1), 122-128.

Muhammad-Lawal, A., & Atte, O. (2006). An analysis of agricultural production in Nigeria. *African Journal of General Agriculture* 2 (1), 185-195.

Olajide, O., Akinlabi, B., & Tijani, A. (2012). Agriculture resource and economic growth in Nigeria. *European scientific journal*, 8(22).

Rehman, A., Jingdong, L., Chandio, A. A., Shabbir, M., & Hussain, I. (2017). Economic outlook of rice crops in Pakistan: a time series analysis (1970–2015). *Financial Innovation*, 3 (1), 13.

Rehman, A., Jingdong, L., Shahzad, B., Chandio, A. A., Hussain, I., Nabi, G., & Iqbal, M. S. (2015). Economic perspectives of major field crops of Pakistan: An empirical study. *Pacific Science Review Business*: *Humanities and Social Sciences*, 1 (3), 145-158.

Saboor, A., Hussain, M., & Munir, M. (2009). Impact of micro credit in alleviating poverty: An Insight from rural

Rawalpindi, Pakistan. Pakistan Journal Life Socitey Sciences, 7 (1), 90-97.

Sajjad, A., Adnan, S., & Hussain, A. (2016). Forest land cover change from year 2000 to 2012 of Tehsil Barawal Dir Upper Pakistan. International Journal Advance Research Biolology Science 3 (9), 144-154.

Shahbaz, B., Ali, T., Khan, I. A., & Ahmad, M. (2010). An analysis of the problems faced by farmers in the mountains of Northwest Pakistan: Challenges for agriculture extension. *Pakistan Journal Agricuture Science*, 47 (4), 417-420.

Sharif, M., Niazi, M. A., Jabbar, A., & Taj, S. (2014). Financial profitability of white sugar production in Pakistan. *Pakistan Journal of Agricultural Research*, 27(3) 175-180.

Sher, H., & Yousaf, S. (2014). Collection and marketing of high value pharmaceutically and therapeutically important plants from the Swat District, Pakistan. *African Journal of Pharmacy and Pharmacology*, 8 (19), 507-513.

Syed Ali Raza, M., Ali, Y., & Mehboob, F. (2012). Role of agriculture in economic growth of Pakistan. *International Research Journal of Finance and Economics*, 83(1), 165-175.

Usman, M. (2016). Contribution of agriculture sector in the GDP growth rate of Pakistan. *Journal of Global Economics*, 4 (2), 1-3.

Osterlind, S. J., Tabachnick, B. G., & Fidell, L. S. (2001). *SPSS for Window Workbook to Acompany: Using Multivariate Statistics.--4th.--Tabachnick and Fidell*. Allyn and Bacon.

Zaheer, R., Omoregbee, F., Ighoro, A., Ejembi, S., Nandan, G., Jangubhai, N. A. M. Patricia, A. T. (2013). Analyzing the performance of agriculture sector in Pakistan. *International Journal of Humanities and Social Science Invention*, 2 (5), 1-10.