

Research Article



An Empirical Assessment of the Dynamics of Agricultural Growth in Pakistan

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Abstract | Agriculture is one of the major sectors of the economy of Pakistan. It contributes 42.3 percent of the labour force and 18.9 percent to GDP of the country. Since its inception, Pakistan's economy is planning to achieve agricultural-led growth to promote economic stability in the country. The present study is an attempt to examine and analyse the nexus of various sub-sectors of agriculture and their contribution to agricultural growth in the country. Data on key variables such as agricultural growth, institutional credit, agro-based industries, Livestock and mechanised inputs are taken from State Bank of Pakistan, World Development Indicators Databases and various issues of Economic Survey of Pakistan for the period 1980-2018. Ordinary least square technique is used to estimate the model. The result shows that Institutional credit is playing a significant role in achieving agricultural growth in the country. The other variables of the model like agro-based industries, livestock, mechanised inputs and agricultural exports have shown a positive impact on agricultural growth and ultimately on the overall GDP growth of the economy. The government needs to allocate more funds for institutional credit, encourage agro-based industries, use of updated technology in the agriculture sector, provide advanced techniques to livestock-related farmers and to promote agricultural exports for foreign exchange earnings to achieve the ultimate goal of agricultural growth in Pakistan.

Received | April 03, 2019; **Accepted** | May 08, 2019; **Published** | July 15, 2019

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Citation | Hayat, U., T. Shah, M.S. Bacha and Muhammad. 2019. An empirical assessment of the dynamics of agricultural growth in Pakistan. *Sarhad Journal of Agriculture*, 35(3): 782-787.

DOI | <http://dx.doi.org/10.17582/journal.sja/2019/35.3.782.787>

Keywords | Institutional credit, Livestock, Mechanized inputs, Agricultural growth, Empirical assessment

Introduction

The agriculture sector is substantially transformed in the past few decades. The rate of output has increased twice earlier periods as a result of changes in production techniques in both developed and underdeveloped economies. The rate of the worldwide production of food increases to 2.2 percent on average in the 1970s, and still the same is moving positively till recent past. The technical changes are experienced in agriculture sector throughout the world, while

still the requirement of food is underestimated worldwide. Millions of developing countries population are still living below the poverty line and having a lower amount of hygienic food. The massive rise in population growth in developing countries resulted in high inequality in the distribution of income led to a fall in per capita GDP and per capita food production. Poverty is considered as one of the prominent factors which hungered agriculture development and ultimately economic development in these countries. On the other hand, a sense of

deprivation is created among the malnourished population of underdeveloped countries. The food crises have emerged with anxiety in people taking agriculture for granted ([Matsuyama, 1992](#)).

The agriculture sector is facing two prominent problems. The first one is dependence on nature which is biological in nature. This resulted in fluctuations in production output from season to season as well region wise variation depends upon natural resources of the country. The second problem in this regard is economic in nature which is the adjustment of farmers in the progression of agriculture development, while still, the output is growing at a diminishing rate. As the economy develops, the GDP and employment share of agriculture sector invariably decreases. Undeniably, the size of the labour force in agriculture sector falls in the later stages of development in these countries ([Mellor and John, 1995](#)).

The agriculture sector in Pakistan is playing a vital role as it absorbs 42.3 percent of the labour force and contributes 18.9 percent of GDP. It stimulates growth in other sectors of the economy and a major source of foreign exchange earnings. The government is keen on supporting small scale innovative technologies, and marginalised and small farmers to enhance agricultural growth. According to the 6th population census of Pakistan, the population growth is raising at 2.4 percent per year. This growing population is raising the demand for agricultural products in the country. The present government is focusing on the development of this sector through subsidised fertilisers, enhancement in agriculture credit, promoting high-value crops, crop diversification and low mark_up on loans for tube wells. The performance of this sector over the last thirteen years has increased manifold. The agricultural sector showed massive growth during 2017-18. It was 3.8 percent during the same period which is relatively better than the growth rate during 2016-17. This resulted from credit and intensive fertilisers offtake, proper availability of certified seeds, attractive supportive and output prices and higher yields. The crops sector witnessed a growth rate of 3.83 percent in 2017-18 compared to 0.91 percent in 2016-17 ([PES, 2018](#)).

The important crops such as wheat and cotton showed significant growth during 2017-18. It was recorded 3.57 percent during 2017-18 which was greater than the performance of the said crops during 2016-17.

Sugarcane and rice, major Kharif crops surpassed production targets during 2017-18 and recorded a significant figure of 8.65 percent. The crops having a major share in value addition process like vegetables, fruits and fodder grew by 3.33 percent during 2017-18 and contributed about 2 percent of GDP. Livestock share of 11 percent in GDP and 58 percent in agriculture grew by about 4 percent in 2017-18 compared to 3 percent growth in 2016-17. Similarly, the fisheries sector contributes about 0.4 percent in GDP and 2 percent in the agriculture sector. Forestry sector having 0.4 percent share in GDP and 2 percent share in the agriculture sector have a significant growth rate of 7 percent in 2017-18 compared to -2.4 percent growth in 2016-17 due to massive production of timber in Khyber Pakhtunkhwa ([PES, 2018](#)).

Agriculture development needs adequate and timely supplies of crucial farm inputs. The farmers are of poor level, and they cannot afford to invest in the recommended dose of fertilisers, improved seeds, farm advance machinery etc., so low availability of financial resources is one of the key issues which leads to low production yield in Pakistan compared to developed countries of the world. Various studies recently conducted show that farmer's yields of various crops were much higher in case of borrowers from various sources compared to non-borrowers ([Dawar, 2003](#)).

The studies suggest that credit is one of the prominent factors among other inputs of production to bridge the production capacity gap between underdeveloped and developed countries and to meet the cash requirements of small farmers. In Pakistan, there are two types of credit advances to farmers which are bifurcated in institutional loans and non-institutional loans. These loans are used for agricultural development. In early days of Pakistan's history, agriculture credit was mainly sponsored by commission agents, landlords, friends and relatives. Informal sources of finance were comprised of 84 percent of total lending in the country. The rate of interest for such loans was much higher than the market rate. The condition was also imposed on the farmers that they will sell their output to lenders. The lender has two advantages in this case. One was the purchase of farmers output at lower market price and the second was charging a higher interest rate on loans ([Faridi et al., 2015](#)).

To combat this issue and to avoid exploitation of farmers, the government of Pakistan initiated

institutional credit facility through Zarai Taraqati Bank Limited (ZTBL), Cooperative societies, Taqvi loans and commercial banks is considered one of the prominent source of the institutional loan in the country. ZTBL advances loans of various terms such as long, medium and short term to farmers. Long term loans mainly granted for the installation of tube wells, construction of warehouses and the purchase of farm machinery. The medium-term loans are granted mainly for levelling of lands, purchase farm implements, setting up of agro-based industries. Loans for processing, raising and marketing of crops are granted under the umbrella of short term loans. To facilitate the requirements of farmers, ZTBL has disbursed all categories of loans to the farmers (long, medium and short term). The total allocation of Rs. 125 billion has been assigned to ZTBL during 2017-18. Since the major need among the farmers is of short term loans which were raised by more than 10 percent during the same period (PES, 2018).

In recent times agriculture is a key to growth and development in a country. Farmers can use modern technology if they have enough financial resources to purchase mechanised agriculture inputs (Akram, Sial and Ijaz, 2008). Studies conducted by (Ahmd et al., 2007), Obilor (2013) concluded that the role of institutional credit by commercial banks in Pakistan had a vital impact on agricultural development. The studies conducted by (Zuberi, 1990; Sohail et al., 1991; Iqbal et al., 2003; Waqar et al., 2008; Ahmed et al., 2015; Chandio et al., 2016) showed that institutional credit, inorganic fertilisers, water and hybrid seeds have a significant positive impact on Agricultural output.

Likewise, ZTBL (Zari Tarqati Bank Limited) disbursement of credit to farmers for various purposes has a significant impact on farmer's income and field crops output Jan and Manig (2008). Moreover, a study conducted by Abedullah et al. (2009) showed that easy access and flexible agriculture credit had a significant impact on farm productivity. Bashir et al. (2010) while studying the nexus between institutional credit and wheat productivity in Lahore, Pakistan explored that credit had a visible impact on wheat productivity in the region. They further showed that the socioeconomic conditions of farmers also improved in the area and it happened as a result of using mechanised inputs and enough fertilisers requirement which become possible by institutional credit.

The export-led growth hypothesis induced at the end of the 20th century utilised the panel data and cross-sectional research work with multi-dimensional aspects and recorded the diverse outcomes. After the inception of export led growth idea, Chenery and Strout (1966), Michaely (1977), Balassa (1978), Heller and Porter (1978) and Kormendi and Mequire (1985) uses Ordinary least square method to examine the relationship between exports and economic growth of various countries. Coefficient of correlation was used to measure the nature of the connection between exports and economic growth. The results of these studies show that there exists a significant positive relationship between exports and economic growth. McKinnon (1964) and Helpman and Krugman (1985) resulted that exports are affecting economic growth in both ways (Direct and Indirect) through proper utilisation of available scare resources in underdeveloped countries. The new econometric techniques used by Voivodas (1973), Balassa (1978) and Ram (1987) applied the model of linear regression to examine the connection between economic growth led by exports. The agricultural exports showed remarkable achievement in the case of economic growth in these countries. Kavoussi (1984) utilised the data of 73 panel countries for the period of 1960-78 to show the link between agricultural exports and agricultural growth. Cobb-Douglas production technique was used to check the causal relationship between the mentioned variables. The result showed that agricultural exports contributed significantly in economic growth in these countries because expansion in agricultural exports contributes significantly towards economic growth through export promotion policies. Primary exports were prominent factors among overall agricultural exports in sample countries.

Various studies have been conducted to analyse and examine the connection and significance between agricultural exports and economic growth, but the results have found mixed results. Some studies showed a uni-directional relationship between agricultural exports and economic growth while other shows bi-directional relationships. In the present study, an attempt was made to show the significance of agricultural exports in overall agricultural growth in Pakistan (Bulagi et al., 2014).

On the same way, Bashir et al. (2007) studied the case study of 114 loan and non-loan farmers to analyse the effect of formal credit on output for sugarcane crop in

Faisalabad, Pakistan. Results show that institutional credit had a significant effect on sugarcane productivity. The study conducted by [Ahmad et al. \(2015\)](#) in Jhang, Pakistan using filed survey of 160 farmers having access and no-access to institutional credit resulted that the impact of the loan was negligible on non-beneficiaries farmers while the same was significant enough for those who received loans.

Materials and Methods

The present study is an attempt to examine and analyse how different explanatory variables, such as Institutional Credit, livestock and agro-based industries contributes to Agricultural Growth in Pakistan over the period of 1980-2018. Data on the variables are taken from various sources including State Bank of Pakistan, various issues of Economic survey of Pakistan, Ministry of Agriculture, Bureau of Statistics and (WDI) World Development Indicators databases.

Ordinary Least Square (OLS) is used to estimate the regression model. The following model is used to gauge the significance of mentioned variables towards GDP growth in case of Pakistan.

$$AG = b_0 + b_1 IC + b_2 AI + b_3 LS + b_4 MI + b_5 AE + u$$

Where;

AG= Agricultural Growth; IC= Institutional Credit; AGB= Agro-based Industries; LS= Live Stock; MI= Mechanized Inputs; AE= Agricultural Exports; u= stochastic term.

The data on Agricultural Growth, Institutional credit, Agro-based Industries, Live Stock and Mechanized inputs is time series in nature over the period of 1980-2018. The major sources of data are Federal Bureau of Statistics, various issues of economic survey of Pakistan, World Development Indicators and State Bank of Pakistan.

Results and Discussion

This section highlights the results of the regression model using SPSS 21. [Table 1](#) shows the descriptive statistics of Agricultural Growth, Institutional credit, Agro-based Industries, Live Stock and mechanised inputs in Pakistan. The maximum growth in the agricultural sector is 6.73 percent while the minimum growth is 1.36 percent. The mean of agriculture growth rate is about 3.03 percent which shows that

this sector gradually developed over the period of time and still needs more attention to feed the massive population in the country and to export the surplus to bridge the gap between demand and supply of foreign exchange reserves in the country. The mean value of institutional growth is 6.1 percent in Pakistan. It shows that from 1980 to 2018 the various forms of institutional loans disbursed by various commercial banks and ZTBL in the country had significantly affected the agricultural growth which in turn led to higher GDP growth in Pakistan. The minimum value of institutional growth is 2.71 percent while the maximum is 19.71 percent. One of the experiences of a certain number of developed countries to achieve their development target is the path of agro-based industries. Pakistan since its inception is trying hard to use the same model. Agro-based industries are one of the key sectors of agricultural growth and GDP growth in Pakistan which is evident from the 6.85 percent growth. The mean value of agro-based growth is 6.38. The minimum value is showing a negative figure which shows that initially with the rise in demand for agro-based industries will result in a shortage and which in turn will affect agricultural growth negatively but when the economy reaches to a certain level of growth the figure turn to significantly positive. Livestock is one of the key sources of farmer's income and the source of milk and allied products for masses. The livestock significantly affecting the agricultural growth in the country and it is 2.13 percent in the country. The minimum and maximum value of livestock are positive in achieving agricultural growth in the country. Modern research in agriculture research shows that after the green revolution in 1960' where agricultural output raised by multiples in agrarian economies. The mechanised inputs is another important factor in promoting agricultural based growth in Pakistan which is obvious from the significant figure of 4.54 percent in our case. If proper mechanised inputs are used with other important ingredients it will lead to inputs are used with other important ingredients it will lead to bumper crops in the country and will achieve the agricultural-led growth in Pakistan. Similarly, in modern capitalist economy exports are considered as the strength of the economy. In our case, agricultural exports are playing a vital role in promoting overall growth in the agricultural sector, and it is evident from the mean and standard deviation value of 3.21 percent and 7.80 percent respectively.

[Table 2](#) summarises the regression results of the model.

The t value shows that institutional credit, agro-based industries, livestock, mechanised inputs have a significant impact on agricultural growth in Pakistan over the period of 1980-2018. Since the coefficient of multiple determination (R^2) is the index of the overall significance of the model. Result of $R^2 = 0.87$ depicts that the mention variables are enough significant in case of agricultural growth based on the empirical evidence it is suggested that agricultural growth may be encouraged through various support programs to farmers in all parts of the country in order to achieve the ultimate goal of economic growth and economic development in the country.

Table 1: Descriptive statistics.

Variables	Mean	Standard Deviation	Minimum	Maximum
Agricultural Growth rate	3.03%	1.38	1.36%	6.73%
Institutional Credit	6.10%	4.82	2.71%	19.71%
Agro based Industries	6.85%	6.38	-9.13%	29.69%
Livestock	2.13%	5.95	2.25%	34.82%
Mechanized Inputs	4.54%	7.80	0.21%	39.27%
Agricultural Exports	3.21 %	2.91	1.21%	17.25%

Table 2: Regression results.

Dependent Variable: Agricultural Growth		
Variables	Coefficient	t-statistic
Intercept	0.398	4.239
Institutional Credit	2.251	6.227
Agro based Industries	1.443	-5.882
Livestock	3.664	7.321
Mechanized Inputs	4.335	2.112
Agricultural Exports	2.453	3.323
$R^2 = 0.87.332$; D-W stat = 2.833		

Conclusions and Recommendations

The objective of the present study was to examine and analyse the effects of institutional credit, agro-based industries, livestock, mechanised inputs and agricultural exports on agricultural growth in Pakistan over the period 1980-2018. The mentioned explanatory variables are the key inputs in promoting agricultural growth in Pakistan. Results suggested that over the sample period the overall agricultural growth is satisfactory but since Pakistan is facing serious economic issues including low GDP growth, poverty alleviation, unemployment, high public debt and fiscal deficit. To achieve the GDP growth targets in Pakistan, Agriculture sector may be prioritised to

make the dream of growth and development come true, and this may be possible if we provide enough funds, updated technology, educating farmers on new sowing techniques, indigenous research on foods and allied products and taxing agricultural commodities. All these will help the agriculture sector to be competitive and commercialise which in turn will create more employment opportunities and will absorb the unemployed task force and will alleviate poverty and inequality in the distribution of income. This was the lessons learned from the development of certain developed countries who followed the track of agro-based industries to uplift the status of their agrarian economies to industrialised economies.

Novelty Statement

The present study is a comprehensive assessment of various as-pects of agriculture growth in Pakistan. It will be an addition to lit-erature in the capacity of various factors contributing to agricultural growth in under developed economy.

Author's Contribution

Umar Hayat: Supervised the research work.

Tariq Shah: Prepared methodology section of the study.

Muhammad Suleman Bacha: Estimated the model.

Muhammad: Improved the first draft of paper.

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