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The Role of Budget Deficit in the Economic Growth of Pakistan

By Najid Ahmad
Bahauddin Zakaryia University, Pakistan

Abstract - The basic aim of this paper is to investigate the relation between Budget Deficit and Gross Domestic Product of Pakistan. There are three views about this relation. Keynesian says that there is a positive relation between budget deficit and economic growth while neo-classical views that there is an inverse relation between budget deficit and economic growth. Recardian says that there is neutral relation between budget deficit and economic growth. A time series data for the period of 1971-2007 has been used to check the relation between budget deficit and economic growth of Pakistan. GDP is taken as dependent variable, FDI and budget deficit as independent variables. ADF test has been used to check the stationary of the data. All variables get stationary at 5% level of significance at level. The results of Granger causality test show that there is bi-directional causality running from budget deficit to GDP and GDP to budget deficit.

Keywords : *GDP, budget deficit, OLS, Pakistan.*

GJMBR-B Classification : *JEL Code: F43, O49*



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The Role of Budget Deficit in the Economic Growth of Pakistan

Najid Ahmad

Abstract - The basic aim of this paper is to investigate the relation between Budget Deficit and Gross Domestic Product of Pakistan. There are three views about this relation. Keynesian says that there is a positive relation between budget deficit and economic growth while neo-classical views that there is an inverse relation between budget deficit and economic growth. Recardian says that there is neutral relation between budget deficit and economic growth. A time series data for the period of 1971-2007 has been used to check the relation between budget deficit and economic growth of Pakistan. GDP is taken as dependent variable, FDI and budget deficit as independent variables. ADF test has been used to check the stationary of the data. All variables get stationary at 5% level of significance at level. The results of Granger causality test show that there is bi-directional causality running from budget deficit to GDP and GDP to budget deficit. OLS results show that there is positive but insignificant relation between budget deficit and GDP of Pakistan. In this way, the results follow the Recardian approach that there is neutral relation between budget deficit and economic growth of the country. Budget deficit has no role in bringing back the economy to its equilibrium.

Keywords : *GDP, budget deficit, OLS, Pakistan.*

I. Introduction

The basic aim of this paper is to investigate the relationship between Gross Domestic Product and budget deficit of Pakistan. Economic growth and economic development are two terms used together but they are different from each other. Economic development is the increase of the welfare of the society and economic growth is the increase in average income of that economy. Najid Ahmad (2012) shed light on the importance of investment for economic growth of Pakistan. He views that investment is necessary for economic growth. He says that one percent increase in investment will raise GDP by 0.89 percent. He suggests that government should spend most of its budget share on productive tasks as it will lead to economic growth. Government should encourage national and international investors who are positively contributing for the progress of the country. Najid Ahmad (2012) explores the relationship between GDP and energy consumption of Pakistan. He thinks Pakistan's economy as energy dependent. For his study he uses GDP as dependent variable and energy consumption as independent variable for the period of 1973-2006. He views one percent increase in energy consumption will raise GDP by 1.23 percent. He thinks energy consumption necessary for economic growth and for energy we should utilize our own resources like by constructing biogas plants and solar energy because these will reduce the foreign dependency.

Najid Ahmad (2012) finds trade as an engine for economic growth and development of Pakistan. He views that economic growth is hidden in trade liberalization. Trade liberalization reduces poverty and at another place he suggests economic growth in educational sector and finds positive relation between primary enrollment and economic growth of Pakistan. It is necessary to focus on our educational sector for the prosperity of the country. Najid Ahmad (2012) finds positive and significant relation between economic growth and exports of Pakistan. He used OLS techniques and says one percent increase in exports will raise GDP by 0.81 percent. The expansion of exports leads to economic growth and this expand growth will lead to more exports.

Budget deficit means the situation where the expenditures exceed its revenues. There are different views of the economists about the relationship between budget deficit and economic growth. Keynesian says there exists positive relationship between budget deficit and economic growth. On the other hand neo-classical are in a view that there is an inverse relationship between budget deficit and economic growth while Recardian says that there is neutral relation between budget deficit and economic growth. Nur Hayati (2012) explores the relationship between budget deficit and economic growth in Malaysia. She uses quarterly data for the period of 2000-2011 for her analysis. She finds no relationship between budget deficit and economic growth in the long run. She suggests policy that government should increase national income, per capita income and also there is need to improve the quality of life so that Malaysia can be in the list of developed country till 2020. She says there is no role of budget deficit on economic growth and the shocks in the Malaysian economy can be controlled with the help of productive expenditures.

Bose (2007) finds positive relation between budget deficit and economic growth in 30 developing countries while Ghali (1997) finds neutral relation between budget deficit and economic growth in Saudi Arabia. Kormendi and Meguire (1985) find no relationship between these two variables. Here is Huynh

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(2007) who says that there is negative impact of budget deficit on economic growth in Vietnam while Saleh (2003) concluded by saying that budget deficit has diverse effect on GDP. Gohar Fatima (2012) finds negative relation between budget deficit and economic growth of Pakistan. She suggests balance budget for economic growth. She says that budget deficit is because of government short resources to meet expenses in the long run. Savings are not enough to meet the expenses. Here is Yaya Keho (2010) who finds the mix results about the relation of budget deficit and economic growth in seven West African Countries. The author finds no causality between budget deficit and economic growth in three countries and four countries show negative relation between budget deficit and economic growth. Most governments' in Pakistan faced budget deficit because of lesser revenue and high expenditures. Government can increase revenue by increasing taxes, using previous surplus. Government can also print money and borrow it by using internal and external sources.

II. Objectives

The basic aim of this paper is to investigate the relationship between budget deficit and economic growth of Pakistan. There are different views of the economists about this relation. Some favor budget deficit and think it beneficial for economic growth and some think surplus budget as a blessing for the economy. While some of them views that there is no role of budget deficit in economic growth of the country.

III. Hypothesis

H_0: There exists no relation between budget deficit and economic growth in Pakistan.

H_1: There exists positive and significance relation between budget deficit and economic growth in Pakistan.

IV. Methodology, Data Collection and Interpretation

A time series data has been used to check the relation between budget deficit and economic growth in Pakistan. The time period is taken from 1971-2007. The data on these variables (GDP mls $, FDI mls $, Budget Deficit mls $) has been collected from world development indicator (WDI) and economics survey of Pakistan (various issues). All variables have been converted into log form.

The econometric model is given as:

$$GDP^*=\alpha+\beta_1(BD^*)+\beta_2(FDI^*)+\mu$$

GDP* is the gross domestic product of Pakistan in mls $, BD* is the budget deficit of Pakistan (mls $) and FDI* is the foreign direct investment of Pakistan in mls $. The symbol star (*) indicates the log form of the variable. Augmented Dickey Fuller Test is used to check the stationary of the variables. A time series data usually show trend with the time. This trend can be removed by differencing. It is necessary to check the stationary of the data for an appropriate technique. The results of ADF test are given in table 1:

Table 1 : Results of Augmented Dickey Fuller Test at level with intercept

Variables	ADF (t-critical) value at 5% significance level	T-Value	Probability
D(GDP*)	-2.9499	-6.503840	0.0000
D(BD*)	-2.9499	-3.468581	0.0016
D(FDI*)	-2.9499	-3.676786	0.0009
Source: Author			

All variables get stationary at 5% level of significance with intercept. So Ordinary Least Squares method can be used to check the relationship among the variables. Before applying the OLS I am using Granger Causality Test for the direction of the variables. The results of Granger Causality test are as:

Table 2 : Results of Granger Causality Test

Lag 2:

Null Hypothesis	Obs	F-Statistic	Probability
FDI* does not Granger Cause GDP* GDP* does not Granger Cause FDI*	35	1.95436 7.71700	0.15927 0.00198
BD* does not Granger Cause GDP* GDP* does not Granger Cause BD*	35	9.24649 5.72021	0.00074 0.00786
BD* does not Granger Cause FDI* FDI* does not Granger Cause BD*	35	1.72818 1.76868	0.19482 0.18788
Source: Author			

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The results show that foreign direct investment does not Granger Cause GDP and GDP does Granger Cause FDI. There is uni-directional causality running from GDP to FDI. Null hypothesis is rejected at 5% level of significance. GDP does Granger cause FDI as probability is 0.00198 and F-Statistic is 7.71700. P-value is less than 5% so null hypothesis is rejected. Budget deficit does Granger cause GDP and GPD does Granger cause budget deficit (p-value is less than 5%). There is bi-directional causality running from budget deficit to GDP and GDP to budget deficit. The results also show that there is no causality between FDI and budget deficit. Keeping in view the above results we can use OLS for our model. The results of Ordinary Least Squares Method are given in table 3.

Table 3 : Results of Ordinary Least Squares Method

Dependent Variable: D(GDP*)
Method: Least Squares
Sample(adjusted): 1972- 2007
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std.Error	t-statistic	Prob
C	0.018633	0.009895	1.882987	0.0685
D(FDI*)	0.117738	0.059331	1.984421	0.0556
D(BD*)	0.024375	0.063215	0.385596	0.7023

R-squared	0.116311	Mean.dependent.var	0.029349
Adjusted R-squared	0.062754	S.D.dependent var	0.052390
S.E. of regression	0.050720	Akaike info criterion	-3.045355
Sum squared resid	0.084892	Schwarz criterion	-2.913396
Log likelihood	57.81640	F-statistic	2.171734
Durbin-Watson stat	1.881778	Prob(F-statistic)	0.129998

Source: Author

Here Durbin-Watson stat is 1.88 that is good sign for our model. The R-squared is 0.116311 that means 12% variation in dependent variable (GDP) are due to independent variables (FDI and budget deficit) and others are due to error term. The coefficient C has positive sign (0.018633). The variable FDI has positive and significant relation with dependent variable GDP. One percent increase in FDI will raise GDP by 0.12%. The variable budget deficit (BD) has positive but insignificant relation with GDP of Pakistan.

V. Conclusion

An attempt was made to find the relation between budget deficit and economic growth of Pakistan. GDP was taken as dependent variable while budget deficit and FDI as independent variables. All variables get stationary at 5% level of significance at level. The results of Granger Causality test show that there is bi-directional causality between GDP and budget deficit of Pakistan and uni-directional causality running from GDP to FDI. The results of Ordinary Least Squares show that FDI has positive and significant relation with the gross domestic product of Pakistan. One percent increase in FDI will raise GDP by 0.11%. There is need to invite foreign investors so that our country can make progress. Government should encourage foreign investors by giving them incentive and facilitation for the promotion of FDI in Pakistan. Political instability is the element that is harming FDI. This factor should be kept in mind before making any policy. The OLS results show that there is positive but insignificant relation between GDP and budget deficit. The results follow the Recardian approach who said that there is neutral relation between budget deficit and economic growth of the country. Budget deficit has no role in bringing the economy to its equilibrium. There are other factors that are affecting the GDP of Pakistan. What are those factors it appeals for further research.

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Attempt for Explanation of Declining Labor Force Participation of Women in Turkey through Test of under-Participation Trap Hypothesis, Applied on Microfinance Survey Data

By Tomáš Hes, Alena Neradová & Prof. Karel Srnec
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Abstract - Labor markets of Turkey are characterized by low female labor force participation when compared with the OECD, neighbour states and EU averages. Besides, the female labor force participation exhibits an unexplained and suprising declining trend in the last decades. The paper attemps to illuminate the phenomenon searching for contingencies in data presented by working women in a microfinance clientele survey in suburban Ankara, especially focusing on status and family related interrelationships that could provide explanation for the low relative number of working women in labor markets of Turkey, testing the Under-participation trap hypothesis.

Keywords : *CULS, microfinance, funding, turkey, microcredit, under participation trap, TGMP.*

GJMBR-B Classification : *JEL Code: R23, C83*

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Attempt for Explanation of Declining Labor Force Participation of Women in Turkey through Test of under-Participation Trap Hypothesis, Applied on Microfinance Survey Data

Tomáš Hes [α], Alena Neradová [σ] & Prof. Karel Srnec [ρ]

Abstract - **Labor markets of Turkey are characterized by low female labor force participation when compared with the OECD, neighbour states and EU averages. Besides, the female labor force participation exhibits an unexplained and suprising declining trend in the last decades. The paper attemps to illuminate the phenomenon searching for contingencies in data presented by working women in a microfinance clientele survey in suburban Ankara, especially focusing on status and family related interrelationships that could provide explanation for the low relative number of working women in labor markets of Turkey, testing the Under-participation trap hypothesis.**

Keywords : CULS, microfinance, funding, turkey, microcredit, under participation trap, TGMP.

I. Introduction

a) Peculiarity of Labor Force Participation of women in Turkey

Notwithstanding substantial social transformations of the Turkish society in recent decades, the participation of working women, already low by international standards, is decreasing, becoming a phenomenon unparalleled among OECD countries. Despite the changing attitude of men towards working spouses, declining fertility rates, better education of Turkish women and marriages happening at a later age, the share of women seeking or having jobs is on steady decrease in Turkey, from 34.3% in 1988 to 22% in 2008. The labor markets in Turkey thus pave the way for an opposite trend than occurring among OECD countries and present suprising, distinctly lower Labor Force Participation (LFP) rates of women then expected from a dynamic, modernizing country, more so as in the 1980s Turkey enjoyed levels of female LFP similar to developed western economies. (World Bank, 2009) according to the UN Report 48508-TR (UN, 2009) examining the LFP trends in Turkey, urbanization and the decline in agricultural employment are two main factors that have contributed to decrease the share of women in LFP. The women in Turkish urban areas are prevented from employment by unfavourable work conditions that do not permit combination of work with childcare and domestic work activities and therefore prefer to stay unemployed. Urbanization leads women to leave high-participation rural environment to a low-participation urban environment, also due to migration of educated young men into better-paid jobs in manufacturing and services, shifting the family activities away from subsistence agriculture and causing a withdrawal of women from the active labor force. (4) The Under-Participation Trap Hypothesis (UPTH) asserts, that female LFP in Turkey remains low due to reduced participation rates among poorly educated women in urban areas, who face complex cultural and economic barriers that constrain their participation in the urban labor market. So, women with low levels of education who are likely to work in informal sector, are offered too low wages to cover additional costs of own childcare and domestic works. Consequently, labor supply is likely to stay low, and low income causes under-investment in education of girls, maintaining the general level of female LFP in an under-participation trap.

II. Research

a) Background of the study

In August - September 2012, research team from Czech University of Life Sciences (CULS) carried out in coooperation with Turkish microfinance institution TGMP [1] and SESRIC [2], subsidiary organ of the Organisation of Islamic Cooperation (OIC)[3], a survey of the microfinance clientele in the suburban outskirts of Ankara. The survey focused on enterprising women operating in suburbs of bigger Turkish cities, the key

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[1] TÜRKİYE GRAMEEN MİKROFİNANS PROGRAMI.
[2] The Statistical, Economic and Social Research and Training Centre for Islamic Countries.
[3] Organization of Islamic Conference.

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segment of microfinance clientele. This sample of data although originally focusing on other topic, was deemed of interest for the study as urbanization, albeit not analyzed yet to detail, is considered one of reason for low FLP in Turkey. Parallely to microfinance related research, the survey data thus permitted assessment of the socio-demographic nature of the gender related FLP in the informal markets of Turkey, expanded in the study. The goal of the study is to confirm UPTH by statistical testing of hypothesis related to level of education, number of household members and number of children within the framework of UPTH, as well as to add additional elements that may enrich UPTH by other elements, such as influence of religion and past experience with microcredit.

b) Methodology

The study is based upon data retrived from qualitative non-longitudinal questionnaire, converting qualitative responses into discrete interval variables to be examined with standard correlational tools. The survey was completed by 117 active clients, belonging to the stable core of TGMP portfolio of clients, who answered the questions during weekly ordinary repayment sessions of the credit groups under guidance of credit officers. The questionnaire consisted out of 30 closed format questions of dichotomous, rating scale and close-ended importance types, out of which 6 questions were apt for the LFP examination, searching to find correlation between pairs of these.

In order to establish the profile of suitable clients characteristics out from the sample, the answers to 5 selected questions in Tab. 1 deemed to deliver positive value to a MFI in terms of its aptness of the clients to be included in its portfolio, were filtered from the the rest. The selection abstains from speculation by choosing only those topics from the survey that undeniably present a simply understandable plus for any MFI, as depicted below.

The supposition of the paper is that the degree of suitability of clients for MFIs transcends the microfinance sector, providing us with an informative value on conditions which influence women to become job seekers or to work and thus participate in the LFP.

Nr.	Question	Desired answer	% of answers
13	Is frequency of paying the installments of microcredit for you better than frequency of other credits?	Yes	84.00
16	Do social/ family conventions prevent you from becoming a debtor?	No	89.11
23	Does the fact that you are taker of microcredit harm your family/ neighbour relationships?	No	96.00
24	Do you recommend your economic active neighbours to take microcredit?	Yes	95.19
26	Are you holder of more than one microcredit at the same time?	No	58.59

Table 1

In order to test the results on interdependence through statistical methods, we apply the Chi-square test, a measure of the discrepancy between the observed results and hypothetically expected results, with the H_0 of no correlation between the group samples. Four hypothesis were formulated (H_1, H_2, H_3, H_4, H_5,) , in order to determine their probability of truth.

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Fig. 1

O = the observed value
E = the expected value

i. *Hypothesis H_1 formulation*

The UPTH supposes that women living in urban areas with low levels of education are more likely to work in informal sector, are offered too low wages to cover additional costs of childcare. We can thus formulate a hypothesis H_1:

The higher is the number of children in the family, the lower is desirability of women to become microfinance clients and thus the lower is female labor force participation.

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ii. *Hypothesis H_2 formulation*

The UPTH postulates that low level of labor participation is particularly relevant for women with low education levels, who are offered low jobs work with low remuneration, thus steering the unemployed away for employment. We formulate a hypothesis H_2:

The less educated women are the more desirable they are as microfinance clients and the more is the probability of falling into UPTH.

iii. *Hypothesis H_3 formulation*

The UPTH presumes that the costs of family maintenance is too high for women earning offered too low wages to cover additional household maintenance costs to the costs childcare. The intensity of household care are causing women to steer away from employment. We can thus formulate a hypothesis H_3:

The higher is the number of people living in the household, the lower is the propensity of women for labor force participation.

iv. *Hypothesis H_4 formulation*

Additionaly to UPTH, correlation with the past experience of women women with microcredit and their suitability of auto-employment through microcredit is an important factor. We can thus formulate a hypothesis H_4:

Experience with microcredit in the past increases the suitability of women as microfinance clients and thus in labor force participation.

v. *Hypothesis H_5 formulation*

Additionaly to UPTH, the relationship with religious leader implies impact on presumes that the costs of family maintenance is too high for women earning offered too low wages to cover additional costs of childcare. The costs of children ubringing are causing women to steer away from employment. We can thus formulate a hypothesis H_5:

Relationship with religious authorities influences the propensity of women for labor force participation.

III. Testing of Hypothesis

H_1 , H_2 , H_3 ,H_4, H_5

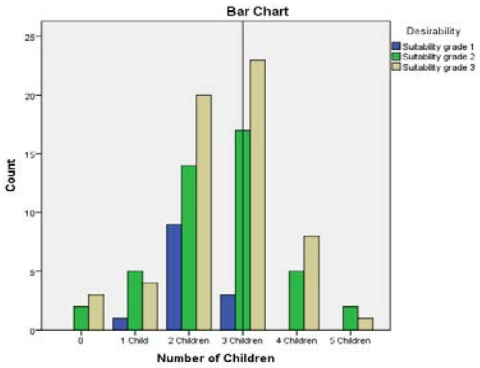
a) Testing of H_1

The two-sided asymptotic significance of the chi-square statistic reaches 0,521 and thus is greater than level of confidence of 0.95 (10 degrees of freedom), which implicates that we cannot statistically confirm the relationship between the number of children and the propensity of women, who are represented by microfinance clients of TGMP, towards self-employment and we thus accept H_0 hypothesis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	9,118681	10	0,520879

Table 2

Chart 1



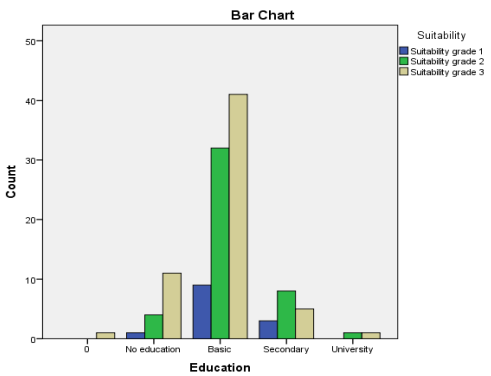
b) Testing of H_2

The two-sided asymptotic significance of the chi-square statistic reaches 0,88 and thus is greater than level of confidence of 0.95 (12 degrees of freedom), which implicates that we cannot statistically confirm the relationship between the education and the propensity of women, who are represented by microfinance clients of TGMP, towards self-employment and we thus accept H0 hypothesis, not confirming the H_2 hypothesis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	6,005994	8	0,646560

Table 3

Chart 2



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c) Testing of H_3

The two-sided asymptotic significance of the chi-square statistic reaches 0,88 and thus is greater than level of confidence of 0.95 (12 degrees of freedom), which implicates that we cannot statistically confirm the relationship between the number of people living in the household and the propensity of women, who are represented by microfinance clients of TGMP, towards self-employment and we thus accept H0 hypothesis, not confirming the H_3 hypothesis.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	13,961650	16	0,601571

Table 4

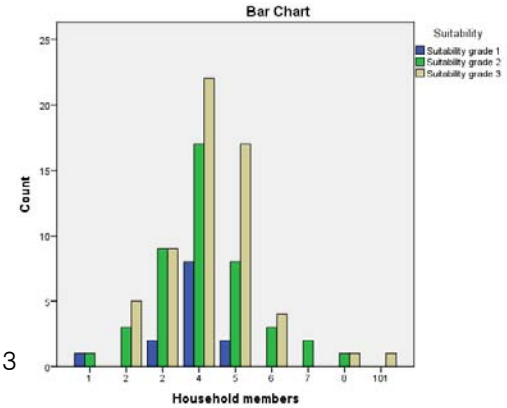

Chart 3

d) Testing of H_4

The two-sided asymptotic significance of the chi-square statistic reaches 0,03 and thus is greater than level of confidence of 0.95 (2 degrees of freedom), which implicates that we can statistically confirm the relationship between the past use of microcredit and the propensity of women, who are represented by microfinance clients of TGMP, towards self-employment and we thus reject H_0 hypothesis, confirming the H_4 hypothesis. The Phi Cramer's measure of 0,258 confirms low strength of dependence.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	6,868270	2	0,032253

Table 5

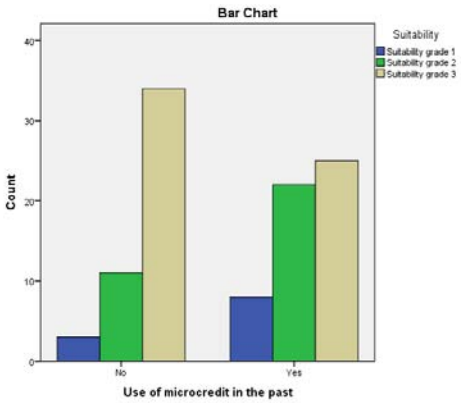

Chart 4

e) Testing of H_5

The two-sided asymptotic significance of the chi-square statistic reaches 0,0002 and thus is smaller than level of confidence of 0.95 (2 degrees of freedom), which implicates that there is relationship between the influence of religious leader and and the propensity of women, who are represented by microfinance clients of TGMP, towards self-employment and we thus reject H_0 hypothesis, and confirm the H_5 hypothesis. The Phi Cramer's measure of 0,378 confirms medium strength of dependence.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	16,756965	2	0,000230

Table 6

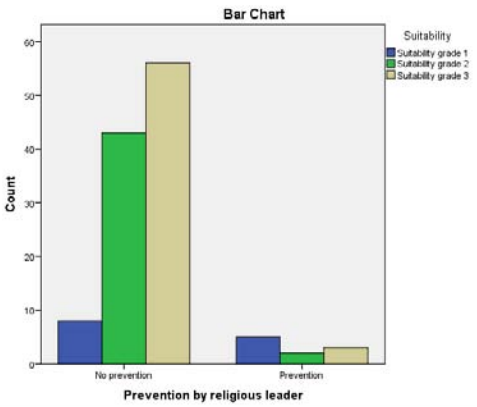

Chart 5

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IV. Conclusion

The study, assuming that the sample of chosen characteristics of female clients of microfinance institutions represent data of informative value also for the non-microfinance clients and thus for labor force participation related topic , did not encounter statistical correlation between the level of education, number of children nor number of household members and the suitability of sample of population of autonomous, enterprising and economically active women, as selected between the clientele of Turkish microfinance institution TGMP. Therefore the Underparticipation trap hypothesis was not confirmed by targeting the mentioned elements, in the search for correlation with the results of the CULS survey field study in Ankara.

However, the additional findings confirm interesting correlation of low to middle strength between the influence of religious authorities as well as between the past experience and the suitability of clients for MFIs. If such finding can be confirmed in more focused studies, the influence of religious authorities can proven to have an effect on the labor force participation women. Likewise, as demonstrated by the study, experience with microcredit in the past increases the qualities of Turkish women with impact to participate in the labor force.

Concluding, the Under-participation Trap Hypothesis is likely to be complex phenomenon explainable by a fabric of multilayer data inputs rather then by single variables Within these, the study is pointing at religion and work experience as being potentially important elements in the explanation architecture.

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A Time Series Analysis of Foreign Aid and Income Inequality in Pakistan

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Abstract - Pakistan economy is one those economies that has received a huge amount of foreign aid. Foreign aid has been considered to help capital-deficient economies to fulfill the desired levels of finances to generate growth, increase employment and income, and furthermore, it helps to alleviate poverty levels in the recipient economies. Present study focuses on the analysis of impact of foreign aid on income inequality in Pakistan. Since time series data is used for the analysis so the ADF and Phillip-Perron unit root test are applied to find out each of the time series to be stationary at its first difference. Johansen contegration test and vector error correction models are employed to examine the long run and short run impacts of growth, foreign aid, foreign direct investment, and labor force participation rate on income inequality, respectively. The cointegration test results confirm negative impact of economic growth on income inequality whereas foreign aid, foreign direct investment and labor force participation rate are concluded to have inequality increasing impacts. The results are statistically significant.

Keywords : *foreign aid, growth rate, foreign direct investment, labor force, stationarity, cointegration, causality.*

GJMBR-B Classification : *JEL Code: E01*



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A Time Series Analysis of Foreign Aid and Income Inequality in Pakistan

Sharafat Ali [α] & Najid Ahmad [σ]

Abstract - Pakistan economy is one those economies that has received a huge amount of foreign aid. Foreign aid has been considered to help capital-deficient economies to fulfill the desired levels of finances to generate growth, increase employment and income, and furthermore, it helps to alleviate poverty levels in the recipient economies. Present study focuses on the analysis of impact of foreign aid on income inequality in Pakistan. Since time series data is used for the analysis so the ADF and Phillip-Perron unit root test are applied to find out each of the time series to be stationary at its first difference. Johansen contegration test and vector error correction models are employed to examine the long run and short run impacts of growth, foreign aid, foreign direct investment, and labor force participation rate on income inequality, respectively. The cointegration test results confirm negative impact of economic growth on income inequality whereas foreign aid, foreign direct investment and labor force participation rate are concluded to have inequality increasing impacts. The results are statistically significant. Vector error correction model results showed long run causality as the coefficient of error correction term has the negative and significant coefficient. The Engle-Granger causality test showed bidirectional causality between aid and growth. The study also draws some conclusions and policy recommendations.

Keywords : foreign aid, growth rate, foreign direct investment, labor force, stationarity, cointegration, causality.

I. Introduction

One of the strands of economic literature considers foreign capital inflows as necessary and sufficient conditions for the economic growth of the developing economies. According to the proponents of foreign aid the inflows of external finance is necessary and sufficient condition for the development of the underdeveloped economies. Argument is that foreign aid not only complements domestic resources but also supplements domestic savings to fulfill saving-investment gap and additional resources become available to achieve targets of growth. Foreign aid helps the developing economies to accelerate the takeoff into the self-sustained growth by encouraging the domestic investment and process of industrial development (Rostow, 1960); Waterson, 1965).

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Foreign aid helps to reduce the foreign exchange gap. Foreign aid provides access to the modern technology and managerial skills. It also provides access to the foreign markets (Chenery and Strout, 1966; Papanek, 1973; Gupta, 1975; Levy, 1988; Thirlwall, 1999). Chenery and Strout (1966) provided a most explicit and well-set model for sustainable development with the help of external financial resources. According to this model, the target of growth can be achieved by filling the dual-gaps by foreign aid. The authors are of the opinion that foreign aid is utilized one to one as investment in the economy. The capital starved country like Pakistan, on its way to growth path, passes through three stages. In first stage, due to the primeval nature of the economy, there may be constrictions on the absorptive capacity to take up desired investment rate for the warranted rate of growth as put forward by the Harro-Domar model of economic growth. The inflows of external aid may help to triumph over the constraint due to absorptive capacity capability. In the second stage, external aid may help to supplement diminutive domestic savings by fulfilling the saving-investment gap that is required for desired growth levels in the economy. In this stage imports may be more that exports due the imported capital goods and machinery, raw material and inputs needed for the economy's production. This increases the trade-gap is the third stage of development. External aid helps to fill this trade-gap. As the economy steps up the ladder of growth, the income inequality would help increasing domestic saving rates to fulfill the domestic saving gap. The growth of the economy leads to imports substitution of consumer goods to be produced locally and exports are increased. Furthermore imports substitution of capital goods imports also start declining and exports, now, grow rapidly in anticipation of the closure of the trade-gap of the economy (Burki, 1998).

The increased investment is a prerequisite for the achievement of economic growth. Mosley (1980) finds a positive impact of aid on economic growth for UK aided countries and negative impact of aid on the growth for French and Scandinavian aided economies. The author also concludes that aid plays no role to improve the growth in Bangladesh, India, Korea, Malawi and Kenya. Hatemi-J and Irandoust (2005), investigating the relationship between foreign aid and economic growth for a panel of developing countries like Botswana, Ethiopia, India, Kenya, Sri Lanka and

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Tanzania, found that aid has a positive and significant on economic activity for each of the country included in the sample. The results of the study imply that inflows of foreign capital, by supplementing domestic savings, have a favorable impact on real income.

One of the strands about the relationship between foreign aid and economic growth is that external capital has negative effects on the growth of the aid recipient economies. Foreign aid is consumed and it substitutes rather than complementing the domestic resources. Foreign aid makes possible the import of inappropriate technology. It may distort the income distribution, and encourage inefficient and corrupt governments in aid recipient developing nations (Griffin and Enos, 1970; Weisskoff, 1972; Boone, 1994; Easterly, 1999). According to some authors the effectiveness of external aid on the growth of the aid receiving country depends on the policy environment. The policy environment may include economic policies adopted by the recipient countries, state interventions in economic activities, business cycles, and stability in inflows of foreign aid into the economy. According to Levy (1984) the negative impact of foreign aid on growth may be due to government intervention, business cycle and instability in aid flows in the aid recipient nations. Burnside and Dollar (2000) concludes that effectiveness of aid on economic growth depends on the soundness of the economic policies pursued by and aid recipient economy. Foreign aid contributes to the growth of private consumption and aid effectiveness on growth may be enhanced by policy reforms (Gounder, 2001; Lloyd *et al.*, 2001; Mavrotas, 2002). But Hansen and Tarp (2001) conclude that aid inflows increase economic growth through capital accumulation and aid effectiveness does not depend on policy environment. Javed and Qayyum (2011) are of the view that inflows of external financial resources have not contributed in the economic development and in the improvement in the living standard of the people in Pakistan. According to the authors external aid, in the absence of good macroeconomic policy, has positive insignificant effect in the long run. External aid showed negative impact on growth in the short run. But with the inclusion of policy index in the model, the external aid has positive and significant impact on economic growth in Pakistan. Javed and Qayyum (2011) suggest sound economic management policy in terms of low levels of inflation, trade openness and low levels of budget deficit to be crucial for the aid effectiveness in the economy.

Singh (1985) taking into consideration the government regulatory actions concludes that state intervention in the economy has negative impacts on growth in the economy. Lensink and Morrissey (2000), examining the effects of aid uncertainty on economic growth, concludes the effect of foreign aid on growth as a function of levels of aid and stability of inflows of aid in the country. According to Pallage and Robe (2001), foreign aid is a major source of income in the majority of aid receiving economies but the authors are of the view that inflows of aid are very volatile and overwhelmingly pro-cyclical. This implies that even if aid fosters growth, the serious problems would nevertheless stem from the fact that patterns of aid disbursement intensify volatility of disposable income of developing countries which affects economic growth negatively.

The studies about the relationship between foreign aid and economic growth have produced inconsistent and elusive results. Empirical studies with respect to Pakistan economy have also concluded mixed results. According to Chishti and Hasan (1992), foreign aid, in the form of grants, has modest effect on public investment but loans show no significant effects on public investment. Net capital inflows, disbursement of grants and foreign loans increase growth in Pakistan (Shabbir and Mahmood, 1992). Some of the empirical studies suggest that foreign has no impact in growth in Pakistan (Ali, 1993). Hussain (1999) is of the view that external aid has positive effect on economic growth in the presence of correct macroeconomic policy environment. Ishfaq and Ahmed (2005) concludes that due to the diversion of aid funds to non-productive activities and inefficient resource allocation in public sector foreign aid not contributed to growth rate of GDP in Pakistan economy.

Alvi and Senbeta (2011) examine the effects of foreign aid on poverty using dynamic panel estimation techniques. According to the authors this technique enables to control for time-invariant country-specific effects of aid and its endogeneity. The study suggested, even after controlling for average income, a significant poverty reducing impact of aid. Foreign aid is associated with a reduction in poverty as measured by the poverty rate, poverty gap index and squared poverty gap index. Alvi and Senbeta also conclude that composition of aid matters as multilateral aid and grants have more poverty reducing effect than that of bilateral aid and loans.

Some of the studies on effectiveness of aid on development conclude that aid may affect some aspects of human development such as education and health. Dreher *et al.* (2006) using panel data and a dynamic panel estimator, using the primary school enrollment rate as the measure of education outcome, examined the impacts of aid to education in less developed countries find that aid has statistically significant positive effects on primary school enrollment rates. Moreover the authors find no robust effect of institutional quality in effectiveness of aid in the sample. Mechaelova and Weber (2006) used same technique to examine the effects of aid on education. The study concludes a small positive and significant effect of aid on primary school enrollment, graduation rates and completion rates. The authors are of the view that

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policies and institutions in aid recipient nations play enormous role for the effectiveness of aid on education.

Mishra and Newhouse (2007) focus on the effectiveness of aid on health outcomes. The authors use panel data to investigate effectiveness of aid different measures of health outcomes. The study concludes that total aid per capita and per capita health aid reduce infant mortality rates significantly but aid has no significant impact on life expectancy. Aggregate aid improves Human Development Index (HDI) and reduces infant mortality rates in less developed nations, Gomanee *et al.* (2005). Gomanee and others are also of the opinion that aggregate aid improves human welfare and reduces infant mortality rate and effectiveness of aid on health and human welfare is higher at lowest levels of income. Aid increases government's expenditure on social spending and increases the absolute income elasticity of poverty and infant mortality reduction in aid recipient economies, Verschoor and Kalwij (2006). Gyimah-Brempong and Asiedu (2008) investigate the impacts of foreign aid on outcomes of primary education and the health sector by using the panel data from a large sample of developing countries. The study concludes that aid has significant and positive effects on primary school completion rates and infant mortality rates. The authors also observe evidence of regional differences in the effectiveness of aid on outcomes of education and health sectors. But this study finds no significant correlation of aggregate aid and outcomes in primary education or health. Gyimah-Brempong and Asiedu support the arguments of Dreher *et al.* (2006) that donors should target their aid for the achievement of Millennium Development Goals (MDGs) in African economies. Gyimah-Brempong and Asiedu (2008) further argue that welfare of the people through aid may be increased if aid is targeted to the primary education and health sectors.

II. The Data Sources, Mehtodology and Statistical Results

This study is an attempt to explore the impact of foreign aid on income inequality in Pakistan. The analysis also includes GDP growth rate, foreign direct investment, and labor force participation rate as explanatory variable in the analysis to test the effects of these variables on income inequality in Pakistan.

$$I = (G, A, F, L) \quad (1)$$

Here I is the income inequality measured by the Gini coefficient, G is the GDP growth rate, A is the official development assistance as percentage of GDP, F is foreign direct investment as percentage of GDP, and L is the labor force participation rate.

In the present study, we have used time series data of all the variables included in the analysis for the period of 1972-2007. The data of the Gini coefficient, real GDP growth rate and labor force participation rate have been taken from the Economic Survey of Pakistan (Various Issues) issued by Ministry of Finance, Government of Pakistan. The data for the official development assistance as percentage of GDP and foreign direct investment is as percentage of GDP have been taken from the World Development Indicators (WDI) (2012) of the World Bank.

The study applies unit root test, Johansen's Cointegration approach and Error Correction Model for the analysis. Since the time series data is used for the analysis, most of the time series are found to be non-stationary. A time series is supposed to be non-stationary if it's mean, variance and autocorrelation is time variant. A non-stationary time series may produce spurious regression, that is, t-ratios and adjusted R-Squared become overestimated in the regression models with the non-stationary time series, Philips (1986). If the time series are stationary at the same level then there may be meaningful association among these variables. In the cointegration analysis, firstly, each of the time series are examined for the presence of unit root and secondly, cointegration test is used to investigate the long run or equilibrium relationship between the variables.

a) The Unit Root Tests for Stationarity

Dickey-Fuller test is used to check the stationarity of the time series when error terms are uncorrelated but when error term become correlated then Augmented Dickey-Fuller (ADF) unit root test is used, Dickey and Fuller (1979). This study employs ADF test on each time series on level and first difference without intercept and trend, with intercept but no trend. The ADF test is specified as:

$$y_t = \rho_1 + \gamma_t t + \gamma y_{t-1} + \sum_{i=1}^{p} \Phi \Delta y_{t-1} + u_t \quad (2)$$

In equation (2), y_t is the level of time series, t is the time trend, and u_t is the white noise error term. The ADF tests the null hypothesis that $\gamma = 0$ against the alternative hypothesis that $\gamma < 0$. In each case, our null hypothesis is that $\Phi = 0$ against the alternative hypothesis of $\Phi < 0$. If the null hypothesis is rejected it is concluded that time series is stationary. If all the time series are stationary at their first difference then they are cointegrated, that is, there exists a long run relationship among the variables, Granger (1986).

It has become a customary to check whether the time series are stationary. We have applied ADF and Phillips-Perron unit root tests, with no intercept and trend, and with intercept and no trend at levels on each of the time series and with no intercept and no trend at the 1st difference of each time series. The results of the ADF test and Phillips-Perron test are reported in the Table 1 and Table 2 respectively.

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Table 1 : ADF Unit Root Test Results

Variable	Level		1st Difference
	No Drift & No Trend	No Drift & No Trend	No Drift & No Trend
LI	-0.7133[0.4000]	-3.0816[0.3702]	-8.1445[0.0000]*
LG	0.2517[0.7528]	-5.8799[0.0000]*	-6.3323[0.0000]*
LA	-1.5009[0.1229]	-2.3842[0.1533]	-6.5162[0.0000]*
LF	-1.4157[0.1434]	-1.0663[0.7180]	-7.3761[0.0000]*
LL	0.6046[0.8423]	-0.7009[0.8336]	-5.7325[0.0000]*

Note: The values in [ ] are MacKinnon (1996) one-sided p-values
*indicate significance at 0.01 level

The ADF and Phillis-Perron unit root tests fail to confirm the stationarity of Gini coefficient, development assistance, foreign direct investment and labor force participation rate both at 1 percent and 5 percent significance level in their level with no drift. The ADF and Phillips-Perron tests confirm the stationarity of each of the time series at their first difference both at 0.01 and 0.05 levels of significance. Both of the unit root tests confirm that all of the time series variables included in the study are stationary, without drift and trend, at their 1st difference at chosen level of significance of 1 percent and 5 percent respectively. Since all of the time series are integrated of the same order so they are considered to be show common trend. After finding all the variables to be stationary at their first difference, Johansen's cointegration test is applied to test whether there is a long run equilibrium association among the variables.

Table 2 : Phillips-Perron Unit Test Results

Variable	Level		1st Difference
	No Drift & No Trend	Drift & No Trend	No Drift & No Trend
LI	-1.0626[0.2545]	-3.047[0.0402]**	-8.6475[0.000]*
LG	-0.6930[0.4094]	-5.8077[0.0000]*	-18.7242[0.0000]*
LA	-1.5170[0.1194]	-2.3842[0.1533]	-10.8207[0.0000]*
LF	-1.3291[0.1667]	-0.8775[0.7835]	-7.3761[0.0000]*
LL	0.6046[0.8423]	-0.7370[0.8241]	-5.7325[0.0000]*

Note: The Values in [ ] Mac Kinnon (1996) one-sided p-values
*(**) indicate significance at 0.01 and 0.05 level.

b) Johansen Cointegration Test

We have used Johansen's cointegration test because Johansen's cointegration test can be applied when three and more than three variables in the model. Engle and Granger (1987) procedure is applied on two variable model. Johansen (1988) developed Vector Autoregressive (VAR) model to ascertain the long run relationship between the variables. Johansen and Juselius (1990) further extended the VAR model. Maximum Likelihood testing procedure on the number of cointegrating vectors has been developed by Johansen (1988) and Johansen and Juselius (1990). The starting point of Johansen's cointegration procedure is VAR of order p as follows

$$Y_t = A_1 Y_{t-1} + \cdots + A_p Y_{p-1} + \varphi + e_t \qquad t = 1, \ldots, T \qquad (3)$$

In equation Y_t is p×1 vector of I(1) time series, the A's are parameters to be estimated, e_t are error terms and φ is the vector of constants. Johansen cointegration method uses an error correction specification to discriminate between stationarity by linear combination and by differencing as:

$$\Delta Y_t = B_1 \Delta Y_{t-1} + \cdots + B_{k-1} \Delta Y_{t-k+1} + \Pi Y_{t-k} + \varphi + e_t \quad (4)$$

The rank of Π suggests the number of cointegrating vectors. The rank of Π shows the number of the linear combinations of Y_t to be stationary. If *a* and *b*, in this case, are both $p \times r$ matrices then rank of Π can be featured as ab' and $0 <$ rank $(\Pi) = r < P$. the Johansen cointegration estimates two test statistics; the Trace statistic and Max-eigenvalue statistic, to explore number of cointegrating vectors.

The time series integrated of the same order are cointegrated, that is, there exists a long run or equilibrium relationship between the time series. We have used Johansen's cointegration technique on the assumption of no deterministic trend in the data. The Table 3 and the Table 4 show the results of Johansen's cointegration test. In the Johansen's cointegration test, first of all, we selected the lag length for cointegration based on the Akaike and Shwarz Information Criteria by using vector autoregressive test. Akaike information

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criterion confirms that the appropriate lag length is 3. The Johansen cointegration method estimated two unrestricted cointegration rank statistics; the Trace statistic and the Max-Eigenvalue statistic. The trace statistic indicated 3 cointegrated vectors at 5 percent level of significance but the Max-eigenvalue statistic confirm 4 cointegrating vectors at 5 percent significance level.

Table 3 : Unrestricted Cointegration Rank Test (Trace)

Null Hypothesis	Eigenvalue	Trace Statistic	5 % Critical Value	p-value*
None **	0.8718	165.9900	69.8189	0.0000
At most 1 **	0.8584	100.2572	47.8561	0.0000
At most 2 **	0.5016	37.7165	29.7971	0.0050
At most 3	0.3792	15.4356	15.4947	0.0510
At most 4	0.0056	0.1802	3.8415	0.6712

* Mackinnon-Haug-Michelis (1999) p-values
** denotes the rejection of the hypothesis at the 0.05 level
Note: Trace test indicate 3 cointegrating equations at 0.05 level.

Table 4 : Unrestricted Cointegration Rank Test (Max-Eigenvalue)

Null Hypothesis	Eigenvalue	Max. Statistic	5 % Critical Value	p-value*
None **	0.8718	65.7328	33.8769	0.0000
At most 1 **	0.8584	62.5407	27.5843	0.0000
At most 2 **	0.5016	22.2810	21.1316	0.0343
At most 3 **	0.3792	15.2554	14.2646	0.0348
At most 4	0.0056	0.1802	3.8415	0.6712

* Mackinnon-Haug-Michelis (1999) p-values
** denotes the rejection of the hypothesis at the 0.05 level
Note: Trace test indicate 3 cointegrating equations at 0.05 level.

The Johansen cointegration test results suggest that income inequality, GDP growth rate, official assistance, foreign direct investment and labor force participation move together in the long run. This implies that the variables are cointegrated. We have normalized the cointegrating vectors with respect to Gini coefficient (LI) for better elucidation. The normalized cointgrating vector is given in Table 4.

Table 4 : Normalized Cointegrating Coefficients

LI_t	LG_t	LA_t	LF_t	LL_t
1.0000	0.2535	-0.0844	-0.1197	-3.1793

We can write the above cointegrating vector in equation as:

$$LI_t = -0.2535LG_t + 0.0844LA_t + 0.1197LF_t + 3.1793LL_t$$
$$t\text{-}value = (-7.0858)\ \ (3.1571)\ \ \ \ (7.1093)\ \ \ \ (-8.0151) \qquad (5)$$

All of the variables used in the analysis are in logged forms, so the estimated coefficients can be interpreted as respective elasticities. In the Johansen's cointegrating equation, dependant and independent variables all are on the same side of the equation, Johnston and Dinardo (1997) so the estimated elasiticities in the Table 4 appear with the reversed signs in the equation (5). Johansen's cointegration model concludes that GDP growth reduces the income inequality in Pakistan over long run period. The GDP growth elasticity of Gini coefficient is -0.2535 and it is significant at 1% level of significance. The results of the study are consistent with the economic theory that the relationship between growth and income inequality can run both ways. The pioneer study about the relationship between growth and income inequality was presented by Kuznets (1955). According to Kuznets (1955) income inequality increases in early stages of growth and at higher levels of growth it starts declining. This inverted U-shaped relationship between growth and income inequality is known as Kuznets hypothesis. The focus of the researchers, in recent years, has been on the analysis of the impacts of income inequality on economic growth of an economy. Some of these studies

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[Persson and Tabellini (1994); Alesina and Perotti (1996); Mo (2000); Panizza (2002) Banerjee and Duflo (2003)] are found to conclude negative impacts of inequality on growth.

The income inequality decreasing impact of growth implies that increase in the real GDP growth would help to reduce the income inequality in Pakistan. The increased growth resulting in employment growth and increase in the average productivity would help the economy to get lower levels of income inequality. Attainment of the higher GDP growth may cause an increase in the employment level as opinionated by the Okun's law in economic theory. The increased growth of the economy resulting in the increasing the productivity more in the low-wage sector than that in high-wage sector would be helpful in declining the income inequality. Increased growth would also increase the aggregate income level and thus the consumption and saving of the economy. Consumption would, directly increase the aggregate demand and would stimulate growth. The increased saving would help to increase investment levels by increasing the productive capacity (capital stock) of the economy in the long run.

Official development assistance increases income inequality in Pakistan as it has the positive sign and it is statistically significant at 0.01 level. The elasticity is 0.0844 showing that one percent increase in official development assistance causes an increase of 8.44 percent in the Gini coefficient of Pakistan. The foreign aid though can be beneficial for the development of the recipient country but reliance on aid makes the pendency of the economy on external sources, increases ways to corruption and also affects economic administration badly. The income inequality increasing impact of external aid may be due to the fact that aid flows might have been used less productively. The leakage of the aid flows into the non-industrious expenditures may have caused negative impacts on growth, (Ishfaq and Ahmad, 2005; Javid and Qayyum, 2011), thereby caused increase in income inequality. Furthermore unpredictable aid flows and unfavorable policies may have resulted in increase the inequality in Pakistan. Pakistan economy received more aid during the military regimes than that in the democratic times. The aid inflows in Pakistan have been observed to be adjusted to the financial and tactical interests of donors rather than requirements of the Pakistan economy, (Javid and Qayyum, 2011). The easy accessibility of aid caused distraction of foreign aid in non-industrious deeds, wastefulness of aided money in civic sector resulted in inefficient allocation of resources. The tax system of an economy not only helps to generate revenue for the government but also it can be a tool for the equal distribution of income. Without a hitch availability of external aid and foreign borrowing kept the government away from tough policy options like substantial taxation of consumption and income due to the elite class of rulers in Pakistan.

Foreign direct investment and labor force participation rate also suggest income inequality increasing impact in long run. The foreign direct investment and labor force elasiticities of income inequality are 0.9997 and 3.1793, respectively. These elasiticities are also significant at 1% level of significant. The inflows of FDI are considered to fulfill the resource gap between desired funds and domestic accessible resources. These inflows also make possible the transfer of managerial skills and new technology in the host country. This transfer of knowledge, skills and modern technical skills improve the productivity of the labor in the host economies, (Todaro and Smith, 2005).

The effects of FDI on income inequality depend on sectoral distribution and on the implemented economic policies in the economy, (Te Velde, 2003). The inflows of the FDI into the skill-intensive sectors expand the relative position of the skilled-labor and thereby result in increased wage inequality. Foreign firms are characterized with the modern technology, more productive methods of production, and more innovative business. Foreign firms grant access to firm-specific training and general education to the labor force and make the skilled-labor productive resulting in an increase in the wage differential between unskilled and skilled labor.

Moreover, the inflows of FDI from the industrialized economies may have negative impacts on growth of the developing economies. If the recipient economy pursues the superfluous protection policies to be a magnet for FDI inflows it may result in reduction of competition and growth in host countries. The substantial reverse flows of profit funds from the host economy may reduce growth of the economy in the long run. Sheikh *et al.* (2011) found FDI to have negative and significant impact on growth of the Pakistan economy. The reverse flows of profit funds and extraction of labor and financial resources from the host economy distort and hinder the growth trajectory of the economy and herby cause an increase in the income inequality.

Labor force participation rate is concluded to have income inequality increasing impact in Pakistan in the long run. Pakistan is one of the developing countries that are characterized with highest population growth rates. The higher population growth, over the decades caused supply pressures in the Pakistan economy. Pakistan being an underdeveloped and capital deficient economy failed to obtain required levels of investment in social sectors such as education and health resulting in the poor quality of labor. Poor quality of labor, consequently, capitulate low incomes and thus lower levels of welfare at household level.

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c) Granger Causality Test Based on Vector Error Correction Mechanism (VECM)

The presence of cointegrating vectors implies that the relationship between the variables can be expressed as Vector Error Correction Mechanism (VECM), (Engle and Granger, 1987). The presence of cointegrating vectors does not confirm the direction of causality. Since income inequality, GDP growth rate, official aid, foreign direct investment, and labor force participation are cointegrated. The VECM modeling is at service to find out the direction of causality. The VECM arrangements regarding the determinants of income inequality is given as follows:

$$\Delta LI_{1t} = \Phi_{10} + \sum_{i=1}^{p} \Phi_{11,i}\, \Delta LG_{1,t-1} + \sum_{i=1}^{p} \Phi_{12,i}\, \Delta LA_{2,t-1} + \sum_{i=1}^{p} \Phi_{13,i}\, \Delta LF_{3,t-1} + \sum_{i=1}^{p} \Phi_{14,i}\, \Delta LL_{4,t-1} + \omega_1 E_{t-1} + \upsilon_{1t} \quad (6)$$

$$\Delta LG_{2,t} = \Phi_{20} + \sum_{i=1}^{p} \Phi_{21,i}\, \Delta LI_{1,t-1} + \sum_{i=1}^{p} \Phi_{22,i}\, \Delta LA_{2,t-1} + \sum_{i=1}^{p} \Phi_{23,i}\, \Delta LF_{3,t-1} + \sum_{i=1}^{p} \Phi_{34,i}\, \Delta LL_{4,t-1} + \omega_2 E_{t-1} + \upsilon_{2t} \quad (7)$$

$$\Delta LA_{3t} = \Phi_{30} + \sum_{i=1}^{p} \Phi_{31,i}\, \Delta LG_{1,t-1} + \sum_{i=1}^{p} \Phi_{32,i}\, \Delta LI_{2,t-1} + \sum_{i=1}^{p} \Phi_{23,i}\, \Delta LF_{3,t-1} + \sum_{i=1}^{p} \Phi_{34,i}\, \Delta LL_{4,t-1} + \omega_3 E_{t-1} + \upsilon_{3t} \quad (8)$$

$$\Delta LF_{4t} = \Phi_{40} + \sum_{i=1}^{p} \Phi_{41,i}\, \Delta LG_{1,t-1} + \sum_{i=1}^{p} \Phi_{42,i}\, \Delta LA_{2,t-1} + \sum_{i=1}^{p} \Phi_{43,i}\, \Delta LI_{3,t-1} + \sum_{i=1}^{p} \Phi_{44,i}\, \Delta LL_{4,t-1} + \omega_4 E_{t-1} + \upsilon_{4t} \quad (9)$$

$$\Delta LL_{5t} = \Phi_{50} + \sum_{i=1}^{p} \Phi_{51,i}\, \Delta LG_{1,t-1} + \sum_{i=1}^{p} \Phi_{52,i}\, \Delta LA_{2,t-1} + \sum_{i=1}^{p} \Phi_{53,i}\, \Delta LF_{3,t-1} + \sum_{i=1}^{p} \Phi_{44,i}\, \Delta LI_{4,t-1} + \omega_5 E_{t-1} + \upsilon_{5t} \quad (10)$$

The terms E's in the equation (6)-(10) refers to the error correction terms. In our analysis, we estimated equation (6) to investigate the causation from explanatory variables to income inequality. The equation (7)-(10) are also estimated to test the causality among other variables in the model. The VECM equations (6)-(10) provide additional conduit for Granger causality to be explained that standard Granger causality test overlooks completely. The VECM approach makes us possible to differentiate between long run and short run causality. The statistical significance of the coefficient of the lagged Es (ω values) is identified by *t*-value. If the coefficient of the error term is negative and significant then there exists long run causality among the variables. The VECM model identifies even a weak causality by applying a joint F-value or a Wald (χ^2) test to the coefficients of the each of the equation in VECM. Significance of the Wald statistic confirms the short run Granger causality. The short run causality means dependant variable acts in response to short run disturbance to stochastic setting. The significance of joint F-value or Wald statistic refers to the robust Granger causality. Prior to the causality test diagnostic tests such as Jarque-Bera test, Breusch-Godfrey Serial Correlation LM Test and heteroskedasticity (ARCH) test are applied on the equation (6)-(10) to check any departure from the standard assumptions. After the confirmation for the standard assumptions to be hold, we applied Granger causality test based on the VECM. The summary results of the Granger causality tests based on the VECM from the equations (6)-(10) are reported in the Table 5.

Table 5 : Multivariate Granger Causality Tests Based On Block Exogeniety Wald Tests (Summary)

	Independent Variable					$\sum\chi^2$ (12df)	E(-1)
	ΔLI_t	ΔLG_t	ΔLA_t	ΔLF_t	ΔLL_t		
1	2	3	4	5	6	7	8
Dep. Variable	χ^2(3df)					[p-value]	(t-value)
ΔLI_t	-	12.9584* [0.0047]	3.6843 [0.2976]	15.2599* [0.0016]	65.8256* [0.0000]	105.5307* [0.0000]	-0.5464** (-3.0016)
ΔLG_t	41.2341* [0.0000]	-	23.3428* [0.0000]	15.8403* [0.0012]	48.0403* [0.0000]	80.3846* [0.0000]	6.0320* (3.2951)
ΔLA_t	9.3715** [0.0247]	9.7138** [0.0212]	-	1.4414 [0.6959]	1.3732 [0.7118]	27.9834* [0.0056]	1.3216 (0.5833)
ΔLF_t	4.0175 [0.2596]	6.0535 [0.1090]	7.6920*** [0.0528]	-	6.0280 [0.1103]	26.0939** [0.0104]	10.140* (3.2326)
ΔLL_t	1.9762 [0.5774]	7.3497*** [0.0616]	3.3455 [0.3414]	5.9042 [0.1035]	-	18.4216 [0.1035]	0.2600 (1.8518)

Note: The values in [ ] and ( ) are p-values and t-values respectively.
*indicates significance at 0.01 level
** indicates significance at 0.05 level
***indicates significance at 0.10 level

The error correction term appearing in the LI equation has the right sign and it is statistically significant at 5 percent level of significance. So it implies that there is a long run causality running from official aid

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to income inequality in Pakistan. The columns 2-5 of the Table 5 show the χ^2 values for individual variable and joint significance of the variable. The joint χ^2 for LI equation shows that there exists short run causality. The individual χ^2 statistics is also significant but not for official aid. The error correction term for GDP growth equation is significant at 0.01 level but it has positive sign. But, for this equation, joint χ^2 statistics is significant showing the presence of short run causality running from income inequality to real GDP growth. All of the individual chi-squared values are also significant at 1.0 percent level of significant.

III. Conclusion

External aid is supposed to help the capital deficient economies by assisting the growth of the economy and therefore reducing the poverty and income inequality in the economy. Pakistan is one of the economies that have received a huge amount of official aid. Present analysis explores the impact of aid on income inequality in Pakistan for the period 1972-2007. The results of the study confirm the income inequality increasing impact of official aid in Pakistan in the long run. It is evident that the financial resources received in terms of foreign aid have not been used for development rather these funds may have been sidetracked to unproductive activities. So the aid inflows could not add to the growth of Pakistan economy, employment generation and therefore increased the income inequality in the economy.

The results imply that there is need to trim down the reliance of the economy on external aid and debt. A healthy environment of the investment would help to improve growth of the economy. Broadening the tax base would help to improve the availability of financial resources domestically. The policies are desired that ensure and encourage the more stable sources of foreign financial funds. The attraction of foreign direct investment and expansion of export oriented manufacturing may be much more reliable and stable source of financial resources. Increase in FDI inflows and export of the economy would stimulate growth of the economy. Increased growth would help in alleviating poverty and reducing income inequality. "Trade, not Aid' policy would be helpful.

Pakistan economy has been characterized with the feature of macroeconomic instability. Inconsistency in domestic policies and unfavorable global economic environment has adversely affected the growth of the economy. Aid by the donor agencies and institutions may be helpful if the aid flows are directed to prop up structural change and provide a footing for long run inclusive growth. Lessening the of role of the state in agricultural marketing, procurement of wheat, encouragement of market-based enticements would be supportive in increasing crop-yields leading to the food subsidy rationalization.

Sectoral reforms, investment in energy sector, financial, infrastructure, manufacturing sectors of the economy would not only enhance efficiency and usefulness but also facilitate private sector investment for future growth. Increase in growth would not be sufficient. Growth should be inclusive and inequality lessening. Job creating and livelihood promoting growth creating employment opportunities for both of the rural and urban low-income households would be desirable. The use of aided money to expand investment, fortify vocational and technical education and training would help to pass on skills to the labor force. Since small scale and medium enterprises are the major job provider so the utilization of the external finance to institute and make possible the business climate for small scale and medium enterprises in Pakistan would be helpful in providing the broadened horizons of livelihood and would reduce the menace of economic and social exclusion of the poor and deprived.

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Government Spending and Economic Growth in Nigeria (1980-2011)

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Abstract - Using time series data of 32years period (1980- 2011), this study investigated the impact of government spending on the Nigerian economic growth. Employing the ordinary least square multiple regression analysis to estimate the model specified. Real Gross Domestic Product (RGDP) was adopted as the dependent variable while government capital expenditure (GCEXP) and government recurrent expenditure (GREXP) represents the independent variables. With the application of Granger Causality test, Johansen Co-integration Test and Error Correction Mechanism, the result shows that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria. The short-run dynamics adjusts to the long-run equilibrium at the rate of 60% per annum.

Keywords : *economic growth, government spending, recurrent expenditure, capital expenditure, Nigeria.*

GJMBR-B Classification : *JEL Code: F43, G18*



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Government Spending and Economic Growth in Nigeria (1980-2011)

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Abstract - Using time series data of 32years period (1980-2011), this study investigated the impact of government spending on the Nigerian economic growth. Employing the ordinary least square multiple regression analysis to estimate the model specified. Real Gross Domestic Product (RGDP) was adopted as the dependent variable while government capital expenditure (GCEXP) and government recurrent expenditure (GREXP) represents the independent variables. With the application of Granger Causality test, Johansen Co-integration Test and Error Correction Mechanism, the result shows that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria. The short-run dynamics adjusts to the long-run equilibrium at the rate of 60% per annum. The policy implication is that that both the short-run and long-run expenditure has significant effect on economic growth of Nigeria. In line with the findings, we recommend that Government increase both capital expenditure (investment in roads, power supply, transport, and communication) and recurrent expenditure mostly on issues that should attract economic growth. Funds meant for development of the Nigerian economy should be properly managed by the executive arm to boost employment as well as improve the wellbeing of citizens since this will cause economic growth indirectly.

Keywords : economic growth, government spending, recurrent expenditure, capital expenditure, Nigeria.

I. Background of the Study

Public expenditure is an important instrument for government to control the economy. It plays an important role in the functioning of an economy whether developed or underdeveloped. Public expenditure was born out of revenue allocation which refers to the redistribution of fiscal capacity between the various levels of government or the disposition of responsibilities between tiers of the government.

Broadly speaking, public expenditure affects aggregate resources use together with monetary and exchange rate. Specifically public expenditure refers to the value of goods and services provided through the public sector.

In the Nigerian economy public expenditure can broadly be categorized into capital and recurrent expenditure. The recurrent expenditure are government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas expenses on capital projects like roads, airports, health, education., telecommunication, electricity generation etc., are referred to as capital expenditure (Obinna, 2003).

The size of government expenditures and its effect on economic growth, and vice versa, has been an issue of sustained interest for over decades now. The relationship between government expenditure and economic growth has continued to generate series of debate among scholars. Government performs two major functions- protection (and security) and provisions of certain public good (Al-Yousif, 2000).

Scholars argue that increase in government expenditure on socio-economic and physical infrastructures encourage economic growth. For example, government expenditure on health and education raises the productivity of labour and increase the growth of national output. Similarly, expenditure on infrastructure such as roads, communications, power, etc, reduces production costs, increases private sector investment and profitability of firms, thus fostering economic growth. As observed by Al-Yusuf and Couray (2009), Abdullah (2000), Ranjan, Sharma, (2008) and Cooray (2009) the expansion of government expenditure contributes positively to economic growth.

In Olukoye (2009) the general view is that public expenditure either recurrent or capital expenditure, notably on social and economic infrastructure can be growth-enhancing.

The provision of infrastructure services to meet the demands of business, households, and other users is one of the major challenges of economic development in developing countries like Nigeria.

Developing countries invest about $200billion a year in new infrastructure representing four percent of their national output and a fifth of their total investment. The result has been a dramatic increase in infrastructure services-for transport, power, water, sanitation, telecommunications, and irrigation (World Bank's Development Report 1994).

Government spending in Nigeria has continued to rise due to the huge receipts from production and sales of crude oil, and the increased demand for public (utilities) goods like roads, communication, power, education and health. There is increasing need to provide both internal and external security for the people and the nation. Available statistics show that total

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government expenditure (capital and recurrent) and its components have continued to rise in the last three decades. For instance, government total recurrent expenditure increased from N4, 805.20 million in 1980 to N36,219.60 million in 1990 and further to N1, 589,270.00 2007. On the other hand government capital expenditure rose from N10, 163.40 million in 1980 to N24, 048.60 million in 1990. Capital expenditure stood at N239, 450.90 million and N759, 323.00 million in 2000 and 2007 respectively. The various components of capital expenditure have risen between 1980 and 2011.

However, the rising government expenditure may have not translated to meaningful growth and development, as Nigeria ranks among the poorest countries in the world. In addition, many Nigerians have continued to wallow in abject poverty, while more than fifty percent live on less than US$1per day. Moreover, macroeconomic indicators like balance of payments, import obligations, inflation rate, exchange rate, and national savings reveal that Nigeria has not fared well in the last three decades.

It is disturbing to note that government expenditure seems to have not replicated same level of economic growth in Nigeria, for instance between 1980 and 1990, while the GDP growth rate was decreasing (57.15% down to 2.87%), government expenditure growth rate was increasing (23.2% to 41.24%). Thus, there is an inverse relationship between the two periods. However, it is found that the growth rate of government expenditure in 2000 and 2010 was 15.53% and 2.15% respectively, while GDP growth rate witnessed 8.79% and 1.54% in the same period respectively. Thus, government expenditure growth rate has been greater than GDP growth in the same period.

Due to the mixed feeling on the above the debate has been inconclusive on whether or not increasing government spending induces economic growth or not. Based on the above this paper attempts to investigate whether increasing government spending induces economic growth performance in Nigeria.

The major objective of this study is therefore, to ascertain whether there is a relationship between government expenditure and economic growth in Nigeria. The specific objectives are:

1. To ascertain the impact of government spending on economic growth in Nigeria.
2. To ascertain if there is long-term causal relationship between government spending and economic growth in Nigeria.

II. Theoretical Review

Economic theory has shown how government spending may either be beneficial or detrimental to economic growth. In traditional Keynesian macroeconomics, many kinds of public expenditures, can contribute positively to economic growth through multiplier effects on aggregate demand. On the other hand, government consumption may crowd out private investment, dampen economic stimulus in the short run and reduce capital accumulation in the long run. Studies based on endogenous growth models distinguish between distortionary or non-distortionary taxation and productive or unproductive expenditures. Expenditures are categorized as productive if they are included as arguments in private production functions and unproductive if they are not (Barro and Sala-I-Martin, 1992).

The earliest of all theories of government growth is Wagner's Law of Increasing State Activity. This theory posits a relationship linking industrialization, urbanization and education to the expansion of the public sector (Bird, 1971).

Wagners' posits that increases in public goods are a product of increased demands by organized industrial workers, coming at the costs of growth in the private sector (Gandhi, 1971; Goffman and Mahar, 1971). Bureau Voting Theory rejected the role of industrialization and urbanization, suggesting that the main driver of public sector expansion is an artificial demand for government services created by self-interested government employees (Niskanen, 1971).

In Fiscal illusion theory which tries to explain government growth by linking convoluted tax systems to the masking of the costs of public goods. Also, tax systems can hide the costs of public goods and therefore stimulate their growth (Goetz, 1977). Empirical support for these theories has varied, causing them to loose some of their impetus.

Government spending is usually suggested that the net impact on growth (as measured by aggregate output) of the crowding-out effect of public expenditure clearly depends on the relative marginal productivity of the public and private sectors. The externality effect of public expenditure enhances growth by raising private sector productivity. Here, a higher level of such expenditure could achieve a high growth rate. The opposing natures of the crowding-out and externality effects rest on the proposition that the structure of public expenditure, rather than merely its level, would be of considerable importance.

III. Empirical Literature

Researchers have attempted to examine the effect of government spending on economic growth in different countries and periods.

Ram (1986) studied the linkage between government expenditure and economic growth for a group of 115 countries during the period 1950-1980. Using both cross section time series data in his analysis, and confirmed a positive influence of government expenditure on economic growth.

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Erkin (1988) examined the relationship between government expenditure and economic growth, by proposing a new framework for New Zealand. The empirical results showed that higher government expenditure does not hurt consumption, but instead raises private investment that in turn accelerates economic growth.

Foster and Skinner (1992) studied the relationship between government expenditure and economic growth for a sample of wealthy countries for 1970-95 periods, using various econometric approaches. They submitted that more meaningful (robust) results are generated, as econometric problems are addressed.

Abu-Bader and Abu-Qarn (2003) employed multivariate co-integration and variance decomposition approach to examine the causal relationship between government expenditures and economic growth for Egypt, Israel, and Syria. In the bivariate framework, the authors observed a bi-directional (feedback) and long run negative zrelationships between government spending and economic growth. Moreover, the causality test within the trivariate framework (that include share of government civilian expenditures in GDP, military burden, and economic growth) illustrated that military burden has a negative impact on economic growth in all the countries. Furthermore, civilian government expenditures have positive effect on economic growth for both Israel and Egypt.

Loizides and Vamvoukas (2005) employed the trivariate causality test to examine the relationship between government expenditure and economic growth, using data set on Greece, United Kingdom and Ireland. The authors found that government size granger causes economic growth in all the countries they studied. The finding was true for Ireland and the United Kingdom both in the long run and short run. The results also indicated that economic growth granger causes public expenditure for Greece and United Kingdom, when inflation is included.

Komain and Brahmasrene (2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger Causality Test. The results revealed that government expenditures and economic growth are not co-integrated. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. Lastly, the results illustrated a significant positive effect of government spending on economic growth.

Olugbenga and Owoye (2007) investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The regression results showed the existence of a long-run relationship between government expenditure and economic growth. In addition, the authors observed a unidirectional causality from government expenditure to growth for 16 out of the countries, thus supporting the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the Wagner's law. Finally, the authors found the existence of feedback relationship between government expenditure and economic growth for a group of four countries.

Liu and Hsu and Younis (2008) examined the causal relationship between GDP and public expenditure for the US data during the period 1947-2002. The causality results revealed that total government expenditure causes growth of GDP. On the other hand, growth of GDP does not cause expansion of government expenditure. Moreover, the estimation results indicated that public expenditure raises the US economic growth. The authors concluded that, judging from the causality test Keynesian hypothesis exerts more influence than the Wagner's law in US.

In Nigeria, many authors have also attempted to examine government expenditure - economic growth relationship.

Oyinlola (1993) examined the relationship between the Nigeria's defence sector and economic development, and reported a positive impact of defence expenditure on economic growth.

Fajingbesi and Odusola (1999) empirically investigated the relationship between government expenditure and economic growth in Nigeria. The econometric results indicated that real government capital expenditure has a significant positive influence on real output. However, the results showed that real government recurrent expenditure affects growth only by little. Also, study by Ogiogio (1995) revealed a long-term relationship between government expenditure and economic growth. Moreover, the author's findings showed that recurrent expenditure exerts more influence than capital expenditure on growth.

Akpan (2005) used a disaggregated approach to determine the components (that include capital, recurrent, administrative, economic service, social and community service, and transfers) of government expenditure that enhances growth, and those that do not. The author concluded that there was no significant association between most components of government expenditure and economic growth in Nigeria.

Ighodaro and Okiakhi (2010) used time series data for the period 1961 to 2007 and applied Cointegration Test and Granger Causality test to examine government expenditure disaggregated into general administration and community and social services in Nigeria. The results revealed negative impact of government on economic growth.

Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied Johansen cointegration technique and error correction model. The

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results inferred that in the short run expenditures on agricultures and education were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant.

Studies in Nigeria, like Nurudeen and Usman (2010) showed mixed results.

Therefore, this study is an improvement on the previous studies on economic growth and government expenditure relationship in Nigeria. It considers government spending only in two categories - capital and recurrent expenditure as important variables that affects economic growth. Secondly, it extends the study period to 2011 and finally employed the Error Correction Mechanism (ECM) in the study.

IV. Methodology

To empirically examine the impact of government expenditure on the economic growth in Nigeria, the researcher subjected the data collected to Unit Root, Cointegration, and Error Correction test. The ADF test is used to test whether the variables are non stationary (unit root). If the results indicate that all series are stationary in the first difference or all series are generated by 1(1) process, condition of stationarity is established or confirmed (Gujarati, 2004). An Error Correction Mechanism is employed to ascertain the speed of adjustment from the short run equilibrium to the long run equilibrium state.

V. Data Sources

To investigate how government spending could affect economic growth in Nigeria, a number of variables have been taken into consideration in this study. These variables consist of Real Gross Domestic Product (RGDP), Government recurrent expenditure (GREXP) Government capital expenditure (GCEXP) for the period of 1980-2011 and are defined in our model specification. All the variables were sourced from Central Bank of Nigeria's (CBN) statistical bulletin for various years. And are all expressed in million Naira.

VI. Model Specification

This study is aimed at establishing the dynamics properties of the relationship between government spending and RGDP in Nigeria over the years (1980-2011). The functional form, on which our model was based, employed a multiple regression equation in the analysis of this work.

In an attempt to capture our essence of this study, and based on previous studies. The Real Gross Domestic Product (RGDP), Government recurrent expenditure (GREXP), Government capital expenditure (GCEXP) were used to formulate our model. Thus, the model is represented in a functional form shown below:

$$RGDP = F(GCEXP, GREXP) \quad \ldots \quad (1)$$

Where

RGDP = Real Gross Domestic Product (Dependent variable)

GCEXP = Government Capital Expenditure (Independent variable)

GREXP = Government Recurrent Expenditure (Independent variable)

In a linear function, it is represented as follows:

$$RGDP = \beta_0 + \beta_1 GCEXP + \beta_2 GREXP + U_t \quad \ldots \quad (2)$$

Where: β_0 = Constant term, β_1 = Regression coefficient of GCEXP, β_2 = Regression coefficient of GREXP and U_t = Error Term.

For usual statistical reasons the above model will be transformed into log linear model as specified below:

$$LRGDP = \beta_0 + \beta_1 LGCEXP + \beta_2 LGREXP + U_t \quad \ldots \quad (3)$$

VII. Results and Discussion

a) Unit Root Test

Considering the ADF and PP test statistics at 5% and10% critical values, it is observed that test statistics are greater than the critical values. Thus, the series are said to be stationary at that level. The unit root test shows that the variables- RGDP, GCEXP and GREXP are integrated of order one. They are integrated of the same order; 1(1). The level of their integrations indicates the number of time series have to be differenced before their stationarity is induced. From the tables (see appendix), it was found that both ADF and PP Test with trend and intercept indicated that time series are integrated of the same order. The linear combination of series integrated of the same order are said to be cointegrated.

b) Co-integration Test

The result shows that there is a long run relationship between the RGDP and the explanatory variables; GCEXP and GREXP. The Johansen Cointegration Test is shown in the appendix. The model with lag 1 was chosen with the linear deterministic test assumption. Johansen cointegration test for the series; D(RGDP,1),D(GCEXP,1) and D(GREXP,1).

Under the Johansen Cointegration Test, there is one cointegrated vectors. In Johansen's Method, the trace statistic is used to determine whether cointegrated variables exist. The trace statistics are found as 0.837326, 0.211942 and 0.043031. The critical values of RGDP, GCEXP and GREXP at both 5% level of significance are 29.79, 15.49 and 3.84 respectively. The trace test indicates one cointegrating equation. In other words, the null hypothesis of no cointegration among the variables is rejected. The test result shows the existence of a long-run equilibrium relationship in

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equations at 5% significance level. The normalized cointegrating coefficients for one cointegrating equation given by the long-run relationship is RGDP = 0.6104 GCEXP + 1.316 GREXP.

From the above equation, it is found that ₦1 increase in government capital expenditure (GCEXP), on the average will lead to increase by ₦0.61k in the gross domestic product (RGDP). More so, N1 increase in the government recurrent expenditure (GREXP) on the average, will lead to increase by ₦1.32k in the gross domestic product (RGDP).

The computed coefficient of multiple determination (R^2 = 0.82460) shows that 93.46% of the total variation in Gross Domestic Product (RGDP) is accounted for, by the independent variables; Government Capital Expenditure (GCEXP) and Government Recurrent Expenditure (GREXP) while 6.54% of the total variation is attributable to the influence of other factors which are not included in the regression function. The value of Durbin Watson (DW) is 0.78. Using 5% level of significance, and k^1=2 (two) and N= 31 degrees of freedom, the tabulated lower (dL) and upper limits of Durbin Watson statistics are 1.297 and 1.570 respectively. Since the computed Durbin Watson statistics (0.86) is less than the lower limit (1.297), there is evidence of autocorrelation in the model.

c) Granger Causality Results

In examining the pair-wise (bi-directional) relationship among the variables, 5% level of significance and 2 and 25 degrees of freedom, the f-tabulated value is 3.39. Considering the f-calculated value of GCEXP and RGDP, the p-value is 0.0017 while the p-value for RGDP/GCEXP is 0.0476. in this case, there is one way causation between GCEXP and RGDP. This implies that the causality runs from GCEXP to RGDP and not from RGDP to GCEXP. The same is applicable to GREXP and RGDP. The causality runs from GREXP to RGDP too. This result is in conformity with the Keynesian theory on government expenditure which stipulates that Gross Domestic Product is a function of government expenditure.

In any case, the existence of a long-run cointegrating equilibrium also provides for short-term fluctuations. In order to straighten out or absolve these fluctuations, an attempt was made to apply the Error Correction Mechanism (ECM).

VIII. The VECM Result

As noted, the VECM is meant to tie the short-run dynamics of the cointegrating equations to their long-run static dispositions. In order to absolve the short-run dynamics of the relationships, the Vector Error Correction Mechanism was adopted. Comparing the result of the OLS, government capital expenditure was bearing a negative sign. However, introducing VECM, it became positive. On the hand, government recurrent expenditure was positive while in this model, it became negative. This result implies that there is a change from the short run dynamics to their long run dispositions. In the long run equilibrium, should the disequilibrium is corrected, Real Gross Domestic Product (RGDP) will increase by 78kobo owing to ₦1 increase in Government Capital Expenditure (GCEXP) while N1 increase in Government Recurrent Expenditure (GCEXP) will bring about decrease by 26kobo in RGDP.

The total variation of 96.03% in Gross Domestic Product is accounted for by the changes in Government Capital Expenditure (GCEXP) and Government Recurrent Expenditure (GCEXP). The joint influence of the explanatory variables on the dependent variables is statistically significant.

IX. Summary/ Conclusion

This research work investigates the impact of public spending on economic growth in Nigeria from 1980 to 2011. None of the variables was stationary at zero level. This means they all have unit roots. The three variables became stationary at first difference by ADF and PP application. There exists a long-run equilibrium relationship between government spending and economic growth in Nigeria; The VECM model negates the OLS model which indicates a change from the short run dynamics to their long run dispositions.

The co-integration test employed revealed that there is a long run relationship between the Real Gross Domestic Product (RGDP) and the explanatory variables; Government Capital Expenditure (GCEXP) and Government Recurrent Expenditure (GREXP). The normalized cointegrating coefficients for one cointegrating equation given by the long-run relationship indicated that the constant value is negative which means that the proportion in the real gross domestic product (RGDP) in Nigeria tends to decrease, keeping other variables constant in the long-run. It is found that N1 increase in government capital expenditure (GCEXP), on the average will lead to increase by N0.19k in the gross domestic product (RGDP) while N1 increase in the government recurrent expenditure (GREXP) on the average, will lead to increase by N0.31k in the gross domestic product (RGDP). In the long run equilibrium, capital expenditure will contribute more to the economic growth of Nigeria.

X. Recommendations

Based on the findings, the following recommendations are suggested;

- Government capital spending in industries and agriculture if properly managed will raise the nation's production capacity and employment, which in turn will increase economic growth in Nigeria.

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- Government should increase its expenditure on rural roads and electricity as this will accelerate the productive sectors as well as raise the standard of living of poor citizens in Nigeria.
- Anti-graft or anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), and the Independent Corrupt Practices Commission (ICPC) should be practically independent to enable them to be more forceful in their actions.
- Those who divert and embezzle public funds should be treated as terrorists in Nigeria.

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Appendices

Augmented Dickey Fuller Unit Root Test

Trend and Intercept

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Remarks
RGDP	-9.532332	-3.5742	-3.2217	1(1)	Stationary
GCEXP	-5.208931	-3.5742	-3.2217	1(1)	Stationary
GREXP	-7.020660	-3.5742	-3.2217	1(1)	Stationary

Phillips-Perron Unit Root Test

Trend and Intercept

Series	PP Test Statistic	5% critical values	10% critical values	Order	Remarks
RGDP	-9.532332	-3.5742	-3.2217	1(1)	Stationary
GCEXP	-5.457266	-3.5742	-3.2217	1(1)	Stationary
GREXP	-7.020660	-3.5742	-3.2217	1(1)	Stationary

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob**
None	0.837326	59.72914	29.79	0.0000
At most 1	0.211942	8.524974	15.49	0.4111
At most 2	0.043031	1.245292	3.84	0.2645

Trace test indicates 1 cointegrating equation(s) at 5% significance.
Normalized Cointegrating Coefficients: 1 cointegrating Equation(s)

RGDP	=	GCEXP	GREXP
		0.6104	1.3146

Ordinary Least Square (OLS)
Regression Result of the GCEXP and GREXP on RGDP
RGDP = f (GCEXP, GREXP)
Dependent Variable: RGDP
Method:Least Squares
Sample:1980-2011

No of observations 32

Variable	Coefficient	St.Error	t-Statistic	Prob.
C	222812.5	10993.83	20.26705	0.0000
GCEXP	-0.04377	0.069161	-0.63282	0.5320
GREXP	0.270971	0.039792	6.809680	0.0000

Source : Eviews' Output

R^2 = 0.82460
F- Stat = 201.08
Durbin Watson (0.68)

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Vector Error Correction Mechanism (ECM)

RGDP = f {GCEXP, GREXP}
Dependent Variable:RGDP
Method: Least Squares
Sample:(Adjusted) 1980-2011
No of observation 30 [Afterdjusting Endpoints]

Variable	Coefficient	St.Error	t-Statistic
C	4786.01	0.20249	0.38822
D(GCE(-1))	0.78611	0.22910	0.63850
D(GRE(-1))	-0.26344	0.18322	-1.43785

R^2 = 0.860271
F Statistics = 135.002

Source : E-views 7.1

DATA

YEAR	RGDP (₦'Million)	GCEXP (₦'Million)	GREXP (₦'Million)
1980	31546.8	10,163.30	4,805.20
1981	205222.1	6,567.00	4,846.70
1982	199685.3	6,417.20	5,506.00
1983	185598.1	4,885.70	4,750.80
1984	183563	4,100.10	5,827.50
1985	201036.3	5,464.70	7,576.40
1986	205971.4	8,526.80	7,696.90
1987	204806.5	6,372.50	15,646.20
1988	219875.6	8,340.10	19,409.40
1989	236729.6	15,034.10	25,994.20
1990	267550	24,048.60	36,219.60
1991	265379.1	28,340.90	38,243.50
1992	271365.5	39,763.30	53,034.10
1993	274833.3	97,079.40	136,727.10
1994	275450.6	70,918.30	89,974.90
1995	281407.4	121,138.30	127,629.80
1996	293745.4	212,926.30	124,291.30
1997	302022.5	269,651.70	158,563.50
1998	310890.1	309,015.60	178,097.80
1999	312183.5	498,027.60	449,662.40
2000	329178.7	239,450.90	461,608.50
2001	356994.3	438,696.50	579,329.10
2002	433203.5	321,378.10	696,777.70
2003	477533	241,688.30	984,277.60
2004	527576	351,300.00	1,032,800.00
2005	561931.4	519,500.00	1,223,700.00
2006	595821.6	552,385.80	1,290,201.90
2007	634251.1	759,323.00	1,589,273.70
2008	674889	1,123,456.00	2,117,362.50

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2009	716949.7	1,325,019.40	2,131,906.00
2010	820749.3	1,694,825.60	2,482,617.80
2011	9,33123.2	1,934,524. 20	2.632,876.50

Source : Cbn Statistical Bulletin Volume 22, 2011

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Socio Economic Impact of Small Dams on Local Vicinity: A Case Study of Aza Khel Dam Peshawar

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Keywords : *impact evaluation study, socio-economic conditions, small dams, khyber pakhtunkhwa.*

GJMBR-B Classification : *JEL Code: F52, O10*



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Socio Economic Impact of Small Dams on Local Vicinity: A Case Study of Aza Khel Dam Peshawar

Abdul Wajid [α], Dr. Abid Usman [σ], Muhammad Kashif Khan [ρ] & Amjad Ali Chaudhry [ω]

Abstract - An attempt is made in this study to evaluate the impact of Mattani Aza Khel Dam on the crop revenues, agriculture practices and overall socio-economic conditions of the area. Primary data regarding household characteristics and farm related data were collected though pre-tested interview schedule while secondary data was collected from printed documents such as PC-I, PC-IVs, progress reports, Development Statistics etc. After construction of dam in the study area, the crop revenue has significantly increased. The traditional cropping pattern has been shifted to the market oriented crops while yield of almost every crop has been improved. The number of livestock has also been increased. The water table has improved and wells were recharged as before dam construction, people were facing acute shortages of water for domestic use. This has reduced drudgery on the local inhabitants. Before dam these people had no proper source of income due to which they were primarily engaged in illegal practices, however, after dam they had started a new life as majority of the people has sufficient land for agriculture. Certain issues were observed that were hindering optimal use of dam water. The uneven distribution of water, lack of water user association, lack of agriculture extension support services and credit facilities, improper maintenance of canal were the additional problems for the farmers. However if these problems are removed, more benefits can be taken from the dam water for local farmers and overall socio economic growth of the people.

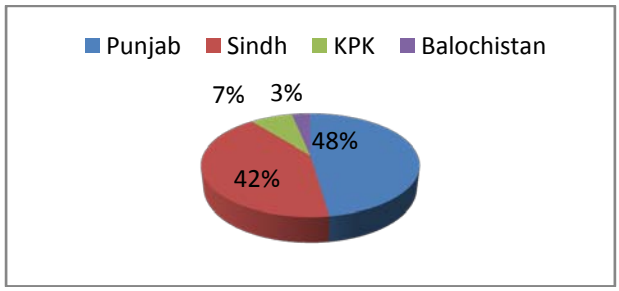
Keywords : impact evaluation study, socio-economic conditions, small dams, khyber pakhtunkhwa.

I. Introduction

The primary inputs for agriculture are water and land. Khyber Pakhtunkhwa (KP) province cultivable area is 2.72 million hectares, out of which only 1.65 million hectares is cultivated while the balance 1.07 million hectares is cultivable waste[1]. KP's total irrigated area is 0.80 million hectares thus 71% of balance cultivable area is arid. These arid areas have no assured water for irrigation, which is the lifeblood input for agriculture. The rainfall is of erratic nature which jeopardizes the investment in rainfed agriculture and hence causes widespread food insecurity in Khyber Pakhtunkhwa. Drought comes after each 3 or 5 years in KP during which these areas are severely affected. An estimated amount of Rs 14 billion were lost due to drought in the year 2000-01 by KP's farmers (KP Agriculture Policy, 2005). On the other side, the rain causes heavy flash floods which destroy crops, irrigation infrastructure, houses. The July 2010 floods have caused damages to the tune of around Rs 185 billion to the province while 1,000 people lost their precious lives. In such situations, farmers normally minimize inputs to reduce risk of loss and mainly depend on off-farm income for their sustenance. (KP Agriculture Policy 2005).

The River Indus is the main source of irrigation water in Pakistan. The water of Indus River has been distributed among the four provinces in Pakistan. The respective share of each province is shown in the following figure.

Figure 1 : 1 % age Provincial Share of Water in River Indus



Source : Water Apportionment Accord 1991

The KP share in the perennial flow of river Indus is 8.78 million acre feet (maf)/117.35 maf which is 7%. (Water Apportionment Accord, 1991) The present irrigation withdrawal is 5.62 to 5.97 MAF (say 6 maf) which shows that province is unable to utilize its due share of almost 2.78 maf. The KP Government has planned a number of schemes to utilize its water, however Federal Government is reluctant in the financing of such schemes. i.e. Chashma Right Bank Canal 1st Lift project costing Rs 62 billion is pending in Federal Government for the last 07 years.

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[1]Cultivable waste comprises that un-cultivated land which is fit for cultivation but was neither cropped during the year nor in the preceding year.

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The KP per capita water availability is around 513.445 cubic meter/capita which is far less than the national and international level i.e. around 1200 & 1000 cubic meter/capita (KP Irrigation Department, 2010). Thus the province is in highly water stress situation. The depletion of ground water is another big issue for the province. A number of various government departments install tube wells throughout the province without any proper planning due to which the province will face acute groundwater shortages. The Irrigation department has initiated complete ban on the installation of tube wells but due to political interference the decision could not be implemented. A study was conducted for ground water in 1988 in the province which needs to be updated. The Irrigation department has proposed a study for updating but the Planning & Development Department is reluctant in its financing. In such like situation there is strong desire to construct small scale reservoir and dams.

A total of 15 numbers small dams have been constructed in the KP province. The basic purpose of these dams is to conserve every drop of available floods and rain water for agriculture. However no evaluation or impact study for these constructed small dams has been carried out. It is not known that whether the precious resources utilized on these dams are fruitful or not. In Punjab Province various impact studies has been carried out for constructed small dams. So there is a strong desire for an impact study of small dam in the Khyber Pakhtunkhwa. An attempt is made in this study to investigate the impact of Mattani Aza Khel dam District Peshawar, on the agriculture production and overall socio economic conditions of the area. This study documents (i) the socio-economic conditions of the farmers, (ii) compare the crop yield, cropping pattern and crop revenues before and after dam construction & (iii) highlight issues and suggest policy interventions.

II. Review of Literature

Bhutta (1999) investigated the impact of small dams in Pothowar plateau. The study revealed that the dam was irrigating 6,000 hectares land against its initial objective of 14,000 hectares land. The larger portion of land was not leveled. The major factor of not achieving the project target was inactive water users association. The other problems highlighted were lack of adequate operation and maintenance activities, uneven water distribution, damaged courses, and unleveled land.

Murray, Sakthivadivel and Amarasinghe (1999) assessed the impact of rehabilitation interventions on the performance Gal Oya Left Bank irrigation system, Sri Lanka. They found that rehabilitation had significantly improved the performance of irrigation system. The irrigated area was increased while the irrigation supply per unit area was decreased. The productivity was highly increased after rehabilitation. They suggested that in addition to the physical infrastructure, the institutional improvement should also be made so that to improve the performance of an irrigation system.

Aga Khan Rural Support Program (2000) studied the impact of 13 small irrigation schemes in Baltistan, Gilgat and Chitral. The internal rate of return of the projects was from 13 to 56 % while cost benefit ratio was from 1.23 to 3.63. A total of 35 % new area was brought under cultivation. The value of land was significantly improved. The raising of livestock was increased due to availability of water. The tree cultivation was started which will improve the soil structure and fertility. The woman workload was increased due to increase in intensity and area of agriculture. The cropping pattern was changed from traditional to high value market crops such as vegetables and fruits.

Saleh and Mondal (2001) evaluated the impact of Bakkhali and Idgaon rubber dam projects, Bangladesh. They examined hydraulic, agricultural and socio-economic factors of the dam in the area through field surveys. They found improved socio-economic indicators of the project and termed the project a viable project. The crop yield and water productivity had improved in both projects however new area irrigated was very less as compare to the actual targets. The actual water availability was much less than the targets as the same were overestimated in both projects during feasibility study stage. The utilization of water in the Bakkhali project was much better than the Idgaon project due to the proper management of irrigation water. Similarly the water supply was sufficient in Bakkali project as compare to Idgaon project.

Pender and Berhanu (2002) investigated the impact of small irrigation schemes in Tigray, Northern Ethiopia. They observed significant improvement on agriculture sector due to these projects. They observed considerable increase in the use of agriculture inputs such as oxens, labor, fertilizer, improved seeds. The crop production had significantly improved. They found that crop production was 18% higher than in rainfed areas. Benin et al (2002) also found similar results in a study in Amhara Region, Ethopia. They observed increased use of agriculture inputs such as fertilizer, chemicals, improved seeds, pesticides, labor after development of small scale irrigation schemes.

Hussain, Hanjra, Thrikawala and Wijeratne (2003) investigated the impact of irrigation investment on poverty reduction. A sample of 858 households was interviewed from Uda Walawe Left Bank Irrigation System, Sri Lanka. Household survey was conducted 5 times during 2000-02 by employing before and after approach. They found that availability of irrigation water had strong effect on poverty reduction and improving welfare of the rural areas. It was observed that crop intensification, land productivity, value of production per hectare and level of crop diversification were on higher

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side in irrigated areas as compare to rainfed areas. At irrigated areas the labor employment was stable due to which it negatively affects chronic poverty.

Chen and Ravallion (2003) studied the impacts of Southwest Poverty Reduction Project implemented in the poor areas of China during 1995-2001. The project covered interventions in agriculture, education, health, off-farm employment, rural infrastructure and enterprise development, and Institution building. They found an average income gain over five years of around 10% of baseline mean income (1995), representing an average return on the project's disbursements of about 9-10%. There was no impact on the consumption poverty using international "$/day" poverty line, however for lower poverty lines, there were indications of significant impacts on consumption poverty. They hold that full impacts of a project can only be calculated after a considerable period is passed by its completion.

Bhattarai & Narayanamoorthy (2003) studied the marginal impact of irrigation and other factors inputs on agriculture productivity in India. They used annual time series data from 1970 to1994 for major 14 states of India. They found that the marginal impact of irrigation on growth of productivity of all inputs is positive and significant with the elasticity of 0.32 while the elasticity of other factors such as fertilizer, High Yielding Variety and road infrastructure is only 0.04 to 0.09. They found strong inverse relationship between poverty and percentage of gross area irrigated. The study reveals that irrigation is strongest factor in reduction in poverty as compare to rural literacy, HYV, fertilizer. While the road infrastructure did not showed any impact on poverty reduction.

Hussain & Hanjra (2004) found higher household income due to higher cropping intensity, higher crop and labor productivity and higher employment in irrigated setting as compare to the rainfed settings. They found strong direct and indirect linkages between irrigation and poverty alleviation. As production and supply shifters Irrigation investment have strong positive effects on economic growth. Irrigation alleviates both permanent and temporary poverty as it is productivity enhancing, growth promoting and poverty reducing. Irrigation benefits land holders in short term while the landless people in long term. They suggested that in order to benefit poor and alleviate poverty, irrigation should be extended along with other policy measures i.e. equitable distribution of land, integrated water resource management, equitable and adequate good quality surface and groundwater, modern production and cultivation technologies, shift to high value market oriented production and opportunities of sale of output at low transaction cost.

Ashraf, Kahlown & Ashfaq (2004) studied the impacts of Khasala, Jawa and Dhok Sanday Mar dams in Punjab. They found that after construction of these dams, the income, land use, crop intensities and crop yield of the farmers have been considerably increased. The cropping pattern has been shifted towards high valued market oriented crops. The water table has improved. The per hectares income in Kharif season ranges $ 833-1000 and Rabi ranges from $ 1000 to 1433 for Khasala and Jawa dams respectively while it is $ 217-617 in Kharif & $ 417 to 617 in Rabi for DS Mar dam. The irrigation methods used were still conventional. They suggested that an integrated program should be developed and implemented in the command area of these dams for the effective utilization of available water and development of irrigation infrastructure. They contended that even more area can be irrigated with the same available water and infrastructure if it is managed properly.

Munawar, Zakir and Muhammad (2004) studied the impact small scale irrigation on the agriculture productivity and poverty level of the farmers in the marginal areas of Punjab, Pakistan. The study covered data of nine tehsils of Pothowar Plateau for 2002-03 period. They found that poverty level is high in rainfed areas as compared to irrigated areas. The poverty head counts were 26% in irrigated and irrigated plus rain-fed areas while it was 37 % in the rainfed areas. The major portion of annual income of poor was from agriculture while for non-poor it was business. Similarly major portion of poor expenditure was on food. The agriculture productivity and profitability of the poor farmers is low as compare to the non-poor farmers, while the cost of production is higher of poor farmers as compare to non-poor farmers. They found strong link in the increase of crop production due to small scale irrigation schemes, which will ultimately decrease poverty in the study area.

Pavlov, Roerink, Hellegers and Popovych (2006) studied the profitability of North Crimea Canal irrigation system in Crimea, Ukraine under market economy. They found that irrigated agriculture is profitable under market economy. The cost of irrigation system can be recovered from the water users. They suggested that irrigation cost can be reduced at farm and distribution level.

Ringler, Rosegrant, Cai and Cline (2006) studied the possible consequences of changes in future water demand for agricultural and ascertain possibilities to provide regular water supplies for irrigation. They discussed that the poor nations will face severe food and water shortages in 2025, which will lead to chronic poverty and malnutrition in these nations. To tackle water scarcity problems, these nations should highly invest in water infrastructure and Institutional reforms should be introduced in water management. With the same policy, water use efficiency of existing system can be improved. An integrated water management approach should be undertaken with specific focus on rain-fed agriculture. The research in agriculture should be encouraged. In irrigation sector, improvement should be initiated at technical, management and institutional

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levels. They propose that for each region, agriculture and water policy should be devised according to its agro-climatic conditions, relative water shortages, level of agricultural growth. At the end they concluded that such policies are difficult to implement as it require financial resources and political will.

Cheema and Bandaragoda (2007) studied the impact of of Mirwal & Shahpur small dams in Punjab, Pakistan. They found that in both dams there was no effective warabandi among the farmers. The existing warabandi was not followed by the farmers. The water conveyance network for both the dam was not properly maintained due to paucity of funds and manpower. The beds of canal were ruined and bushes were grown in cracks which impede water flow. It was observed that most of the areas under the command of these small dams were not leveled. The farmers were facing non-availability of other agriculture inputs such as fertilizer, pesticide, good quality seed etc. At the end they suggested that Government should introduce an effective and justified warabandi system in the area, provide sufficient funds for operation and maintenance of the canal and provide other agriculture inputs at right time and low prices.

Cakmak, Kibaroglu, Kendirli, and Gokalp (2010) studied the performance of transferred irrigation system in Turkey. The data collected for year 2003 was compared with benchmarking indicators. They found that the performance of irrigation schemes had been improved considerably after its transfer to the water user association. The cost of maintenance had been decreased while the revenue from the systems had been increased. The water supply in all the schemes had been improved significantly. Both the financial performance and production performance ratios showed improvement after the transfer of these schemes.

Bantero, Ayana, Awulachew and Seleshi (2010) studied the impact of community run Hare irrigation scheme in Southern Ethiopia. Data were collected through filed surveys and group discussions. They found significant improvement in the overall agriculture production and socio economic conditions of the farmers after the project. The farmers at tail were facing shortages of water as compare to the farmers at head and mid of the canal. In order to use maximum use of available water, they suggested improved institutional and management system of the irrigation system.

Sisay, Katrien, Amare and Tilahun (2011) studied the impact of small-scale irrigation scheme in Blue Nile, Ethiopia. They found positive impact of irrigation scheme on the overall agriculture production, however the application of water was not optimal. The water was not provided to the crops as per requirement due to which huge volume of water were being lost. The high price of pump water compelled water management association to use deficit irrigation and minimize water losses. They suggested night storage mechanisms, optimal irrigation scheduling, and empowerment of farmers for improvement of water productivity.

Owusu, Namara, Kuwornu (2011) studied the impact of irrigation on the social welfare in the rural savannah region of Ghana. Using propensity score matching (PSM) and switching regression techniques it was found that irrigation water availability had positively affected the socio-economic conditions of the people. The net farm income after irrigation water has shown significant increase. They strongly recommended construction of irrigation systems for poverty reduction in both regional and national level.

Bacha, Namara, Bogale and Tesfaye (2011) studied the impact of Indris irrigation system, Ambo district Ethiopia on poverty reduction. Data were collected through field survey from a sample of 222 respondents using with and without project approach. They found significantly higher poverty indicators in without irrigation settings as compare to with irrigation settings. Other than irrigation, the level of household expenditure was also affected by farm size, raising of livestock, land productivity, and family size. They suggested development of irrigation schemes throughout the country for reduction of poverty.

III. Material and Methods

It is an empirical study based on primary data collected from the selected farmers. The Mattani Aza khel dam Peshawar was selected for the study. The dam is located at 35 km southeast of Peshawar city. The catchment area is 49 sq-miles drained by Aza Khel Khawar. The average rainfall of the area ranges from 20 inches to 25 inches. The rain comes mostly during winter and spring i.e. December to April (PC-I). The dam was completed in 2004 with completion cost of Rs 58.206 million. The service area is the village Aza Khel. The total numbers of farmers were around 850. The dam was selected due to its nearest location to the Peshawar City.

A reconnaissance survey was conducted to form scheme typology and get familiarized with the study area. Key activities during reconnaissance were searching for available documents, identifying key informants and first hand information on the dam location, performance, service area etc. Primary data was collected from household survey. An interview schedule/questionnaire was used which was pre-tested and improvements were made in line with objectives of study and ground realities. The household survey collected data regarding personal household information (age, family size, education level, means of income), Farm information (tenural status, farm size, yield, cropping pattern, use of machinery, livestock etc). The farm information was both for before and after dam. Focus group discussions were made with elder

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community, Irrigation department officials and Agriculture department officials. The secondary data includes published documents such as feasibility studies, PC-I, PC-II, KP Development Statistics, KP Annual Development Program, evaluation reports etc. The sources for the secondary data were Irrigation Department, Small Dams Organization, Agriculture Department, District Revenue Offices, Pakistan Council of Research in Water Resources, Peshawar Agriculture University, Peshawar.

The total numbers of farmers were around 850 in the command area of small dam. A sample size of 60 respondents was selected using statistical technique. The farmers were interviewed randomly while 03 different setting (Jirga) were made for group discussions with elders farmers. The paired t-test was applied to test the significance of the data on "before and after" scenario.

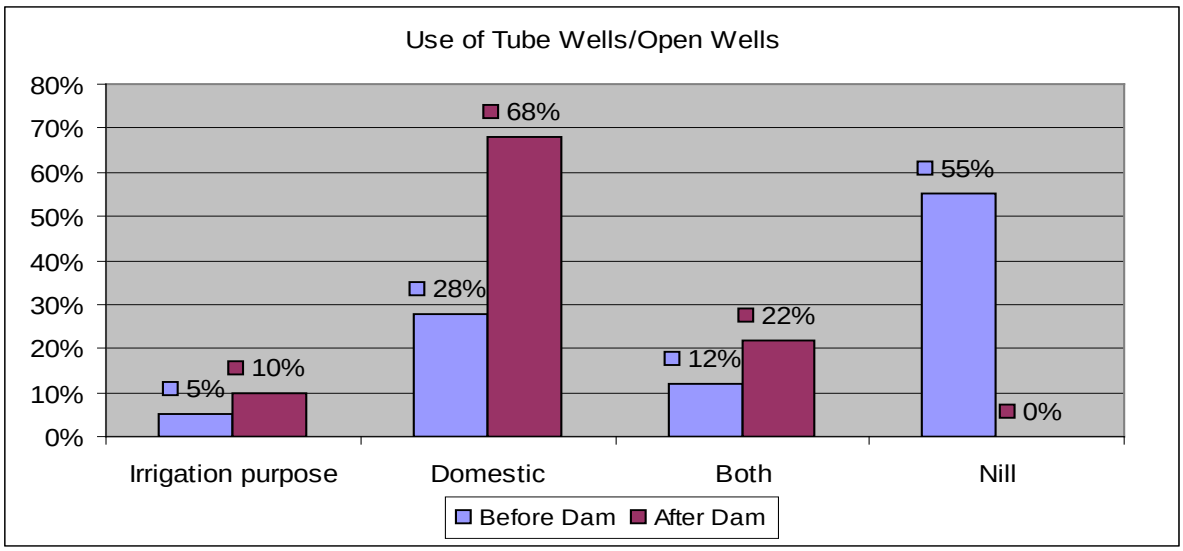
IV. Results and Discussion

a) General Information

In the study area, the average age of farmers was 49.48 years ranging from 17 to 90 years. Seventy percent of the respondents were between the age of 30 and 60 years. The education level was very low in the study area. 62% respondents were illiterate. Out of total 38% literate, 13% respondents had education of primary level, 7% middle, 7% matriculate, 3% intermediate, 8% graduate level and above. There was no tenant in the area as all farmers possess their own land. After dam, some farmers rent in land as their own land was not sufficient for agriculture. Owners were 83 % while 17% were owner-cum-tenant. Majority of the respondents were in small landholding category. 66% of farmers had landholdings less than 5 acres while 34 % between 5 to 9.5 acres. The major 50% of respondent posses land between 2.5 to 5.0 acres. The average family size of respondent in the study area was 13 ranging from 6 to 25. 50 % of respondents were in family size from 11 to 15. Farming was uniform occupation of all the respondents. In addition to farming, 26.66% respondents were doing businesses, 41.66% services while 31.66% were in multiple employment categories.

b) After and Before Dam Comparison

After construction of dam, farmers have got afresh life. Before dam 100% respondents were producing for domestic use while after dam 30% farmers were producing for domestic use, 13% for market purpose while 57% for both domestic use and market purpose. Before dam the ground water was depleted and people were facing acute shortages of water. 55% respondents could not use ground water for any purpose, 5% were for irrigation, 28% were for domestic uses. After dam construction, 68% uses were for domestic purpose, 10% for irrigation purpose, 22% both. The people were happier for dam much for their ground water recharge than to the availability of water for irrigation.



The agriculture extension services were un-available both before and after dam. A slight increase of 13% was observed after dam but the farmers were not happy from their services. No formal credit facility was observed in the sample respondents. Small farmers borrow from big farmers for agriculture and non-agriculture purposes. A slight increase of 7% credit availability was observed after dam construction. Before dam construction, 63% farmers were using fertilizer while after dam 100% farmers were using fertilizer. Similarly before dam, 60% farmers were using chemicals while after dam 100% farmers were using chemicals. Before dam only 2% respondents were using machinery for farming while after dam it improves to 37%. 4 farmers purchased tractors after dam, which they used for their own farming and also rent it out to other farmers. 63% cof respondents were still useing oxen and other conventional farming techniques.

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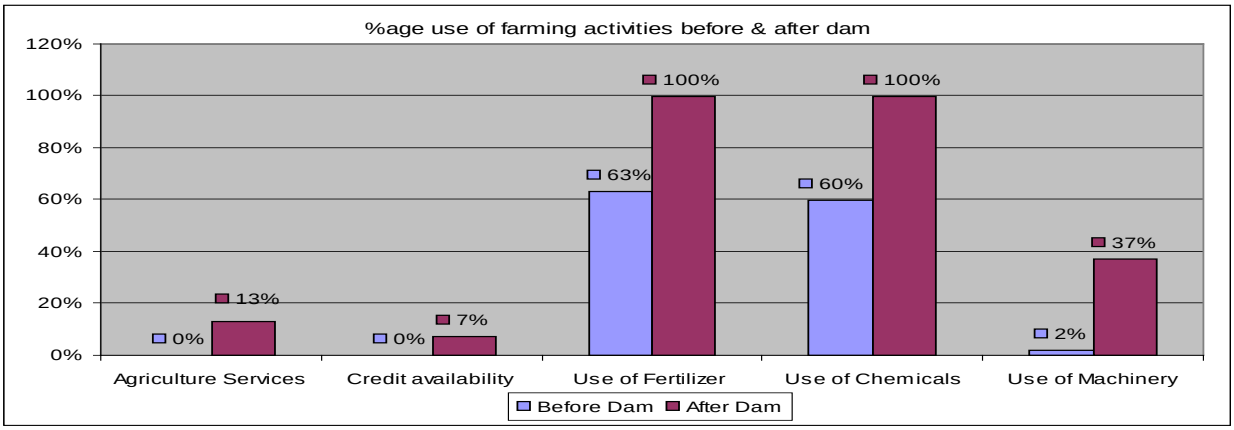
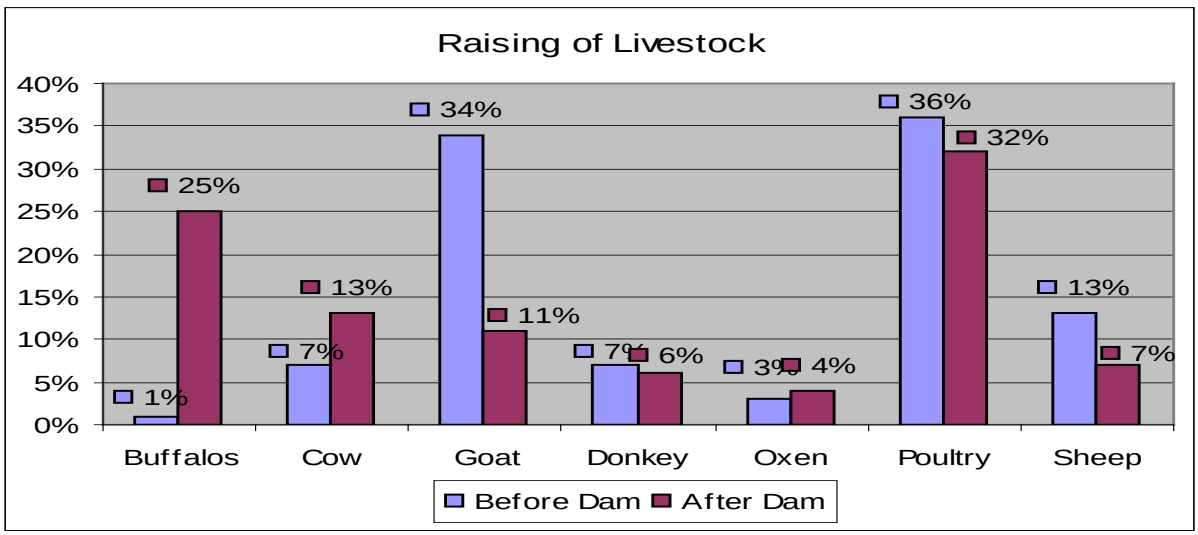


c) Raising of Livestock

The number of live stock had been significantly increased after the dam. Before dam there were 5 buffalos among the respondents while after dam it has been increased to 177. Similarly the number of cows and oxen's were doubled. The number of goats and sheep's were decreased after the dam. The milk was not salable however other milk items were sold. The trading of livestock had also been substantially increased.



d) Cropping Pattern

Cropping pattern is the distribution of land to the different types of crops grown in a given year. With the construction of dam, the cropping pattern of study area has been converted from inferior to superior. There were two cropping seasons i.e. Rabi & Kharif in the study area. Before dam Rabi crops were wheat, gram, oilseeds and Barley while kharif crops were maize, sor/mullets and pulses. After dam Rabi crops were wheat, vegetables such as potato, onion, tomato, peas, reddish, carrot, cabbage & Shaftal while kharif crops were maize, vegetables such as lady finger, tinda, pumkin, bitter gourd, tomato, garlic.

In Rabi season, before dam wheat consists of 86% cultivated area, gram & oilseeds consists 10% while fodders 4%. After dam Wheat was 69% of the croppage area, vegetables 25% and Shaftal 6%. The average farm use in acres during Rabi has been increased from 23 to 34 acres. The yield of wheat was improved from 451.67 kg/acres per acre to 997.22 kg/acre due to the availability of water, which was a 115% increase. The fodder namely barley were changed to the Shaftal. The yield of Barley was 8,000 kg/acre while yield of Shaftal was 12,916 kg/acre. In Kharif, before dam maize was grown on 82% of cropage area while after dam it is around 72%. The average area of maize was 18.86 acre before dam while 15.84 acre after the dam.

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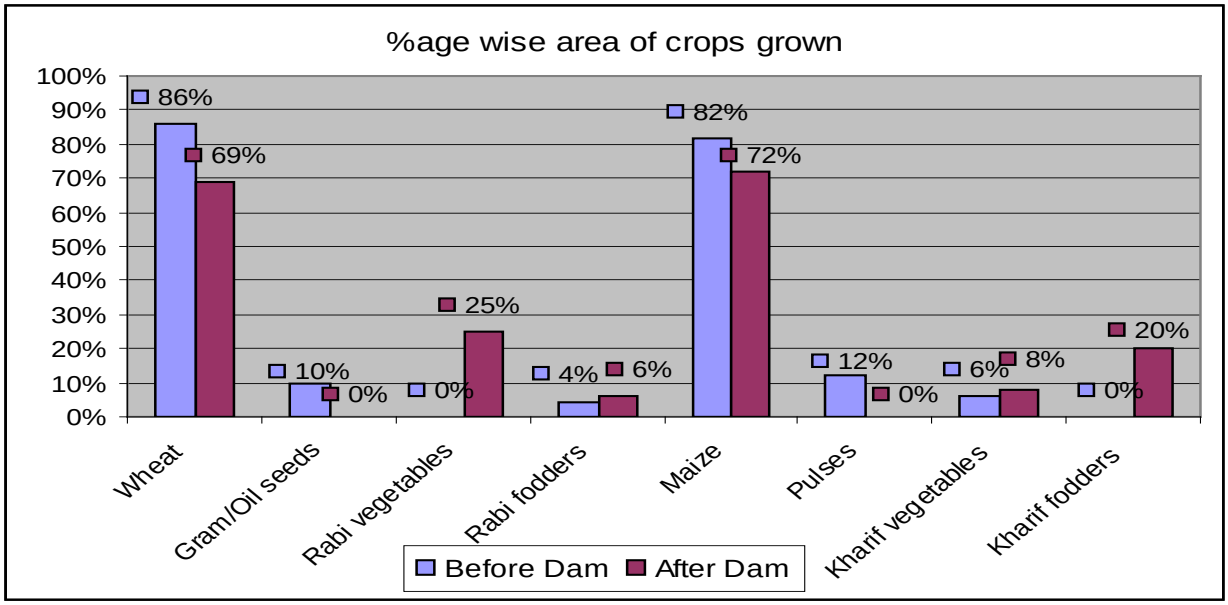
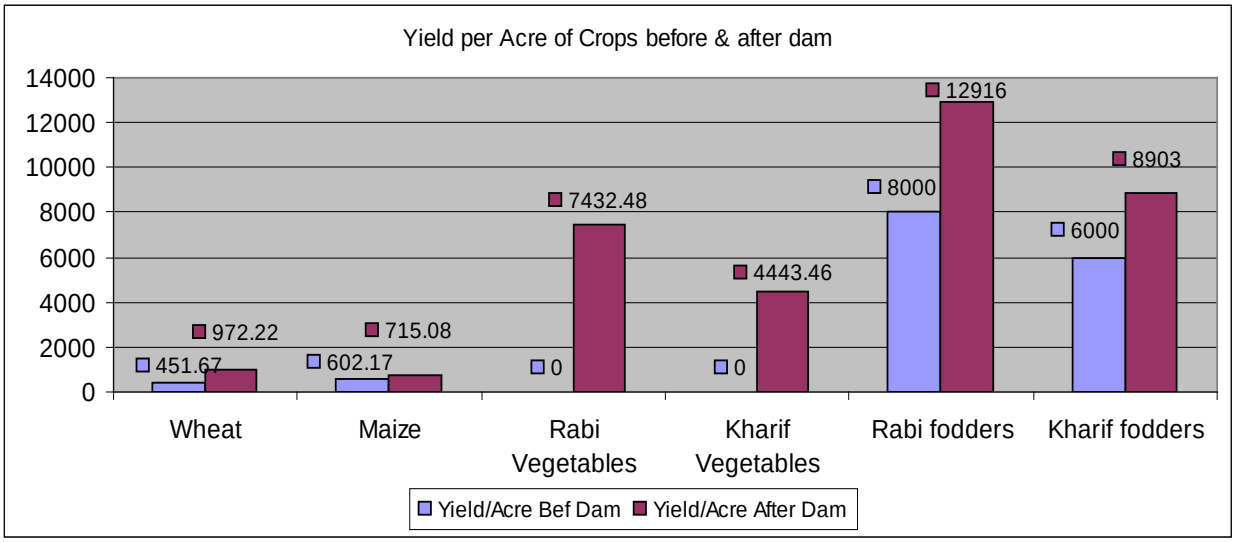


e) Yield

The yield was also improved from 602.17 kg/acre to 715.08 kg/acre, which was 25% increase. In addition to the maize, sor/mullets was around 5% while pulses 7% before dam, while after dam it was not grown. After dam kharif vegetables were grown 20% of the total cropage area. The average farm size of farm during Kharif before and after the dam was almost same i.e 22. The yield of Rabi vegetable was 7432.48 kg/acre while kharif vegetable was 4443.48 kg/acre. Common Kharif fodders were Cheery/jowar both before and after the dam. However its yield was improved from 6000 kg/acre to 8903 kg/acre after the dam, which was 36% increase.



f) Revenues

The paired t-test was applied on the revenues of crop production of individual respondents before and after the dam. The current market prices were used for before and after dam production so that to remove the effect of inflation. The individual farmer average crop revenues was Rs 61,452 before dam while it has improved to Rs 243,373 after construction of dam. The calculated t-test value was found much higher it was concluded that the there is significant increase in the revenues of crop production after the dam.

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Table 4.1 : Pair Wise Comparison of Crops revenues

Pair		Mean	N	T	Df	Sig. (2-tailed)
Rabi	Revenue before Dam	37,330	60	17.162	59	.000
	Revenue after Dam	180,416	60			
Kharif	Revenue before Dam	24,122	60	14.062	59	.000
	Revenue after Dam	62,956	60			
Total	Revenue before Dam	61,452	60	17.045	59	.000
	Revenue after Dam	243,373	60			

V. Conclusion & Recommendations

The traditional cropping pattern has been shifted to the market oriented crops while yield of almost every crop has been improved. The number of livestock has been increased substantially. The water table has improved and wells were recharged as before dam construction people were facing acute shortages of water for domestic use. The crop revenues has been increased significantly. The issues highlighted were uneven distribution of water, lack of water user association, lack of agriculture extension support services and credit facilities, improper maintenance of canal. However if these problems were addressed, more benefits can be reaped from the dam water. The following are recommendations of the study:

- The overall impact of the dam was highly significant on the agriculture improvement in the study area. The small dams are highly desirable and it is strongly recommended that small dams should be constructed throughout the province.
- The water distribution was uneven. The Irrigation department should carry out new warabandi based on the requirements of all the farmers and implement it accordingly.
- The water channels at some reaches were not lined due to which tail farmers were facing water shortages. The whole channel should be lined so water losses can be reduced.
- The farmers were not contacted during Annual operation and maintenance. The farmers were of the opine that they could carryout the operation & maintenance activities by themselves in lesser cost than the Irrigation department.
- The agriculture extension services were not provided in the area. The agriculture department should take immediate steps to provide such services.
- The credit facilities should be made available by the government in the area.
- The other small dams of the Khyber Pakhtunkhwa may be studied for its impact on the farmers.

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22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

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25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.



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28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

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33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

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- Insertion a title at the foot of a page with the subsequent text on the next page
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- Submitting a manuscript with pages out of sequence

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· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

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· Use past tense to describe specific results

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- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
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- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
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- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
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This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
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- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
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- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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