AN EMPIRICAL ANALYSIS OF EXPORTS OF PULSES: A CASE STUDY OF PAKISTAN

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ABSTRACT

Pakistan is an agricultural country and Pulses as being a part of its sub sectors, contributes a significant part in countries economy although its part is very little but their significance level is not limited because pulses are encountered as the most significant food item specially for poor's and it is inexpensive source of protein as compared to other protein substitutes but throughout the world pulses are encountered as inferior diet among all other nutritional items. This study focuses on exports of pulses to explore the pulses development within country. The study is based on secondary data collected through the official documents of Bureau of Statistics, TDAP, crop reporting and many others. The trend analysis covers the period of 1995-2013 includes the charts and pie diagrams and pulses exports were measured through OLS techniques. By the trend analysis it is come to know that pulses exports showed a decreasing pattern up to 2013, however 2005-2006 proved as a boosting period in pulses exports history. Additionally, it was found that Prices of pulses effects the pulses exports negatively, per capita also affects the exports adversely; however yield, FDI, ODA and Gross savings effects the pulses exports positively.

Keywords: Pulses, exports, FDI, ODA, Gross savings and barriers to export

INTRODUCTION

Pakistan as being an agricultural country, is divided into various categories in which Pulses are one of its subdivided parts, it belongs to legume species known as 'leguminosae' and preferred by humans as one of key sources to obtain proteins. "Pulse" is originated from a Latin word 'pultis' (Pultis referred to a thick soup), within pulses Carbohydrates are found in pulses at highest level i.e. > 60% and lipids are found at low level. Pulses are the most ancient, significant and cheapest food for all warm countries. The major exports of Pakistan include the rice, cotton, fruits & vegetables. Pulses are less included in exports category due to its low rate of exporting as compare to exports of other agricultural crops. Even pulses export starts from 2002 and now it seems to be declining. However global trade of pulse shows increasing trend up to 2010. The share of developed countries to worldwide pulses exports was found for about 65%. In which major portion of exports have been contributed by Canada, Myanmar, USA,

Australia and China. Whereas India occupies the top ranking in imports of pulses, and along with India, Bangladesh, Pakistan, Egypt and China contributed around 62% of pulses imports (PK Joshi, *et.al.,*).

List of Exports of Pulses by Pakistan

Pakistan Exports variety of pulses to various countries: The list of exporting pulses along with their exporting countries was collected from Trade Development Authority of Pakistan. Following are the pulses exporting from Pakistan along with their H.S code. H.S code is basically an internationally system of standards in which names and numbers of commodities are internally accepted in a uniform form in order to categorize trade products.

H.S.#	COMODITY BY COUNTRIES
07131000	Peas Dried Shelled
07132000	Chick Peas Dried Shelled(Gram)
07132010	Gram Dry Whole
07132020	Gram Split
07132090	Chick Peas Dried Shelled
07133100	Beans of Species Vigna Mungo
07133990	Other Beans
07134010	Lentils, Dry Whole
07134020	Lentils, Split
07139010	Gram Dry Whole
07139020	Black Metpe Dry Whole Kg
07139090	Other Dried Leguminous Vegetable

Source: Trade Development Authority, G.O.R. Colony, Hyderabad.

Purpose of the Study/Gap

The study aims to explore the scope of pulses in Pakistan by reviewing the trends of pulses' exports of different types of pulses produced within Pakistan. In Pakistan and throughout world various studies have been conducted on determinants of exports performance but not specifically for pulses, that gap is found therefore this study used to determine major factors that effects the export performance that are decreasing the exporting capability and potential of pulses industry.

RESEARCH OBJECTIVES

1. To discover the trends of pulses that determines the exports of pulses from Pakistan (covers the period of 2002-2013).

2. To determine the highest exporting type of pulse among others, most frequently chosen country and boosting period in pulses exports history.
3. To identify the factors that effects the pulses export and level of significance of identified factors with exports of pulses.
4. To explore the impact i.e. either positive or negative of identified factors on pulses exports.

RESEARCH HYPOTHESIS

H_1 = pulses export is predicted by yield, prices, per capita, production, FDI, ODA, gross savings.
H_{1a} = yield is positively significant to pulses exports.
H_{1b} = Prices are negatively significant to pulses exports.
H_{1c} = Per capita net availability is negatively significant to pulses exports.
H_{1d} = Pulses Production is negatively significant to exports of pulses.
H_{1e} = FDI is positively significant to pulses exports.
H_{1f} = ODA is positively significant to pulses exports.
H_{1g} = Gross Savings is positively significant to pulses exports.

RESEARCH METHODOLOGIES

The study aimed to explore the pulses trend and exports of pulses industry, this section tells about the methods and techniques used to obtain desired objectives. The study is based on secondary data collection. In order to outsight the trends a secondary data related to pulses export data is collected from "Trade development authority of Pakistan (GoP) Ministry of Pakistan" whereas ODA, FDI, Gross savings data is collected form online websites of world development indicators (world Bank). The trend is analyzed through clustered column charts, line & symbol charts and pie charts, made on MS EXCEL, SPSS and EVIEWS whereas pulses export is analyzed through econometric model and tested by OLS estimations.

RESEARCH LIMITATIONS

Secondary data limits the potential of the study because Pakistan is facing serious problem of marinating data appropriately. Gathering data from Government office was found very difficult because of pulses as being the part of minor crops, its scope was found very limited and this limited nature of pulses created difficulty in obtaining data on all relevant variables, therefore some variables are taken as whole instead of taken as specifically for pulses.

LITERATURE REVIEW

Pulses are most essential protein and considered as main survival food for poor people throughout the world. Within Pakistan among the all types of

pulse, gram is considered as the key winter leguminous food and major summer legume is mung, along with the most area i.e. about 76% of the total area under pulses is occupied by Gram and 13% of total area occupied by mung (Anonymous, 2010). One more study identified that major pulses grown in Pakistan are Black gram, mung bean, lentil, and mash and shortage of technologies for pulses made their cultivation unsuitable in farming systems Mubarak Ali.et.al in the study states that Pulses consumption are taken as double as it is cooked alone as well as with other proteins. In fact, Daal is an immoral diet eaten with chapatti (Mubarak Ali, *et.al.*).

The pulses cultivation can be sketched back thousands of years on the other hand consumption of pulses have been seen as gentle but sound decline used to happen in both advanced and developing countries whereas in numerous countries, the population is growing day by day at the rate which go more than agricultural yield, i.e. so it is impossible to overwhelmed the improved demand. According to study conducted by Hassan Ali, Pulse are said to be an important object of diet within Pakistan due to their higher level of protein availability and cheapest source of protein among the all food items. Instead of this benefit the average consumption of pulses found to decline from 1960s to 1970s i.e. 0.67 to 0.63 ounces as study directed through CSO (Central Statistical Office), GOP under Annual Household Income and Expenditure Survey and used by researcher in the study, researcher mention the minimum level of average consumption of pulses should be 2 ounces and the normal consumption level has shown a constantly downward trend which may last in the future. Moreover, on the estimated requirement of pulses for 1972-73 was found at 13.24 lakh tons for West Pakistan based on required nutritional standard and as associated to the current supplies, the total needs for West Pakistan are higher by 285 per cent, which means that these are completely accessible for consumption (Hassan Ali, 2016).

According to Chaudhry, *et.al.,* the imports within Pakistan was increased so that the gap of demand and supply would be filled. (Chaudhry, *et.al*.). Then in one more recent study by Saima rani.et.al the demand and supply projections were discussed. According to their findings, the policy environment and consumers' preferences determines the demand and supply but very often it is determined that how the pulses production and consumption are affected by these factors. It is due to the negligence of policy makers on the one hand, and knowledge gap is on the other and lead to poor section of the society suffers from heavy pressure of prices of pulses (Saima Rani, *et.al.*). According to resolution of the study by Abiodun was to produce an opportunity in order to identify the mistakes with agriculture sector and offers new interventions for far needed change. As portion of involvement, numerous countries was forbidden exports and along with tariff

discounts at foods imported. The import contributions in relation to export limitations seemed to be harmful for importing partners and expose incorrect motivations to farmers by just dropping down their prospective market size (Abiodun Elijah Obayelu).

In this regard some more studies identified that tariff reduction can cause the increase in exports performance but in Pakistan it is considered as hard pills for further decline in tariff, whereas tariff decline would rise the country's exports potential and diversification through which offsetting of revenue losses becomes possible. The trade limitations can lead to limit the export competitiveness in this regard the study by Zulfiqar Bashir, *et.al.,* indicates the results and concluded that the trade limitations can cause the protective and uncertain effects on agriculture sectors infect this exports disparity with frankness played a vital part to the enactment of agricultural export (Zulfiqar Bashir, *et.al.*). Alberto Valdés in policy paper showed that the exports policy of Pakistan imposes some restrictions to trade among which the most key implication was bans over some important food items .however exports are not subject to be taxed with some regulatory duties. During 2008 most of the regulatory duties were introduced and tariff freedoms effects agriculture sector. Thus overall agriculture sector's growth has been declined. Pakistan's agricultural trade liberalization ensured the tariff construction and eliminated all assessable restrictions, dropped tariff rates, trading monopolies was also ended state by 2003 (Alberto Valdés).

Karachi Chamber of Commerce & Industry published one research paper and declares that exports are the main defensible and reliable source of foreign exchange. Export performs as key indicator of GDP contribution in this regard Pakistan Exports enactment seemed to as uninspiring due to various reasons and needs to be focused. According to their findings there are several factors influencing exports including Production related factors, regulatory policies and environment, marketing and channeling issues and location or destination. Inappropriate utilization of obtainable sources including Labour force considered as one of the main reason behind production related issues are human resource and rewarded as Pakistan's strength. Within labor force survey of 2012-13, it is mentioned that about 43.7% of Pakistan's population is related to agriculture, whereas manufacturing sector includes the usage of human resource for about 14.06% and remaining 14.39% are used within the trade and services of wholesale and retail markets. Moreover, Devaluation of Pak Rupee is also taken as reason behind exports lacking in which the leading determinant is the exchange rate. As supported by, earlier conducted studies show that about 1% depreciation within ER (exchange rate) increases in the capacity of exports to about 0.39% (Chamber of Commerce Research Report).

In more recent study by Pakistan Institute of Development Economics, factors effecting exports are discussed among them Obtain ability of inexpensive fuel is the most recent issue and eventually boost up the exports. Then Quality certification and devotion to labour force also regarded as problem for exporters. Although exports at the macro level are influenced by the factors that are international and domestic as well. The international factors are FDI, REER, GDP, Taxes, industrialization, communication facilities, savings, official development assistance and labour force are incorporated as domestic factors. The role of FDI in exports development has been already discussed by economic literature. One study found a positive relation of FDI towards exports development and states that multinational companies are the major reason behind the exports development

Hoekman and Djankov (1997) also support that relation and then higher savings also results in advanced volume for exports that reflects the positive impact on exports. To facilitate growth and rise infrastructure, official development assistance is the key factor. So therefore this variable was expected to have a positive impact on export growth (PIODE University Campus).

VARIABLES SUMMARY

Variables in study used to adopt and based on combined information gathered from various previous articles and by reviewing literature main important variables are: Prices of various pulses including Mung, gram, mash, maize, Total and per acre production, yield of pulses and lagged yield, FDI ODA, GROSS SAVINGS, Labor force.

FRAMEWORK FOR RESEARCH

Empirical Model to Test the Export Dependency on Other in Dependent Variables

After trend the second objective was to determine the elements having impact on exports by specifying their predicting nature towards exports and in this regard econometric model have been used and tested through OLS Estimates.

Simple Equation: The functional form of equation used in model is as follow:

EXPORTSt = ƒ (YIELDt, PRICESt, PERCAPITAt, PRODUCTIONt, ODAt, FDIt, GROSS SAVINGSt) …… …… …… … …… …… …… ……. (1)

Linear Regression Equation: The above equation describes the factors impacting pulses export in order to analyze the real measured impact of the independent variables on export s of the pulses, following regression equation have been used and estimated on SPSS as OLS estimates.

EXPORTSt = a + b1 (YIELDt,) + b2 (PRICESt) + b3 (PERCAPITAt,) + b4 (PRODUCTIONt,) + b5 (ODAt) + b6 (FDIt,) + b7 (GROSS SAVINGSt) +μ…… (2)

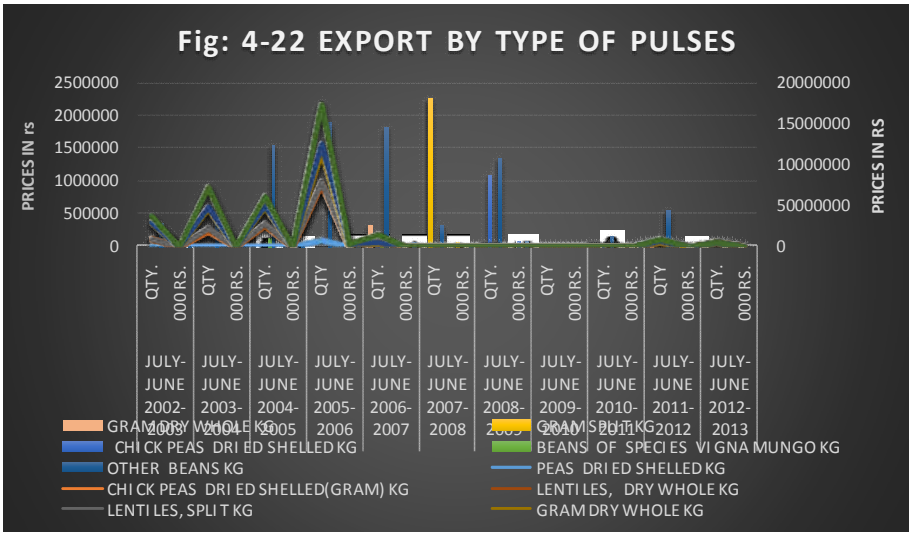
Whereas, the period of time represented by t, EXPORTS is dependent variable represents the total exports of all pulses.

As Independent variables are concerned:

- YIELD is taken as total yield of all pulses in kg per hector
- PRICES of all pulses represents the Average annual prices of 4 cities of Pakistan
- PERCAPITA represents the per capita net availability of all pulses.
- PRODUCTION represents the total production in 000 tons of all pulses
- ODA represents the official development assistance as a GNI %
- FDI represents the foreign direct investment taken as % of GDP
- GROSS SAVINGS represents the gross domestic savings as a percentage of GDP.

As exports of pulses are influenced by both sectors domestic as well as international factors, therefore variables from both sectors have been selected and used in "LINEAR EQUATION". Exports barriers and determinants to exports. Previous studies found a steady decline in pulses area and production in Pakistan, however yield appeared as increasing. Yield is basically referred to as output per unit and pulses yield was found in KG per hectors. As for as prices are concerned, pulses prices were found to fluctuate consistently and great difference found among city wise prices. 4 cities are selected as sample that represents the whole Pakistan as population. therefore, these factors are taken as independent variables in order to know

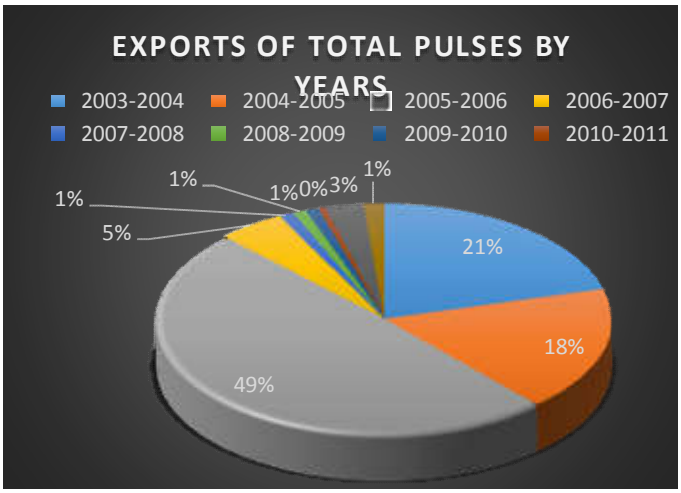
that either decline of that factors impacts the declining exports of pulses or not. FDI, ODA and gross savings were taken as whole instead of specifically on pulses. Many previous studies found positive impact of FDI on exports of all Pakistan, ODA proved to be beneficial for improving exports infrastructure and gross savings also positively impacts the exports therefore these macro variables were adopted to specify the export performance at micro level i-e specifically for pulses.



RESEARCH ANALYSIS

Trend of Total Pulses Exports: The trend of total exports facing downward turn up to 2013 infect from 2007-2010 its decrease reaches to 0 level and again start in 2011. The trend line of total exports also explains the declining pattern up to 2013.

Trend of Exports of Pulses by Types The export of pulses appeared to have a very declining pattern at the end followed by little ups, in which Gram dry whole and split found to have a growth in 2006-2007 and 2007-2008 but after this period their part of being exporting goes to decline up to 2013. Chickpeas found to export in 2008-2009 after this period no growth was found in their exports up to 2013, exports of beans of species vigna mungo has also been grown in 1 period i-e 2004-05 whereas exports of other beans were reached at their peak point within the period of 2005-6 but then its growth used to decline up to 2013. Then exports of other remaining pulses like Peas dried shelled, Chick peas dried, Lentils dried, Lentils Split, Gram Dry Whole, Black Metpe Dry Whole and other dried leguminous were having their growth during the period of 2005-2006. After this period their exports have been decreasing but continued up to 2013.

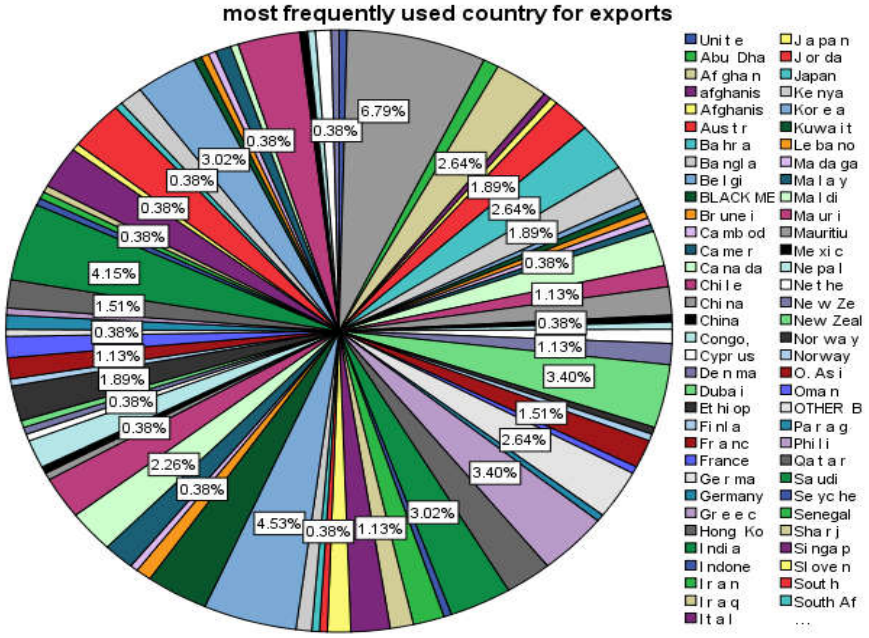


Percentages of Exports by Pulses Types: The above graph shows that the highest ratio of exporting pulse is by chick peas dried shelled for about 31%, then by other dried leguminous vegetables for about 28%, gram dry whole contributes 25 % in exports of pulses and after is 7 % is contributed by peas dried and shelled, however remaining other beans, lentil split and black Metpe dry whole is concerned each of them contributes about 2% then chick peas, lentil dry, gram split, gram dry whole, comprises their part in pulses exports up to 1% from each of them and finally 0% is contributed by beans of species vigna mungo, it does not mean that beans of species vigna mungo has no part in exports of pulses but 0% means that it contributes a little part in total exports in comparison of other pulses.

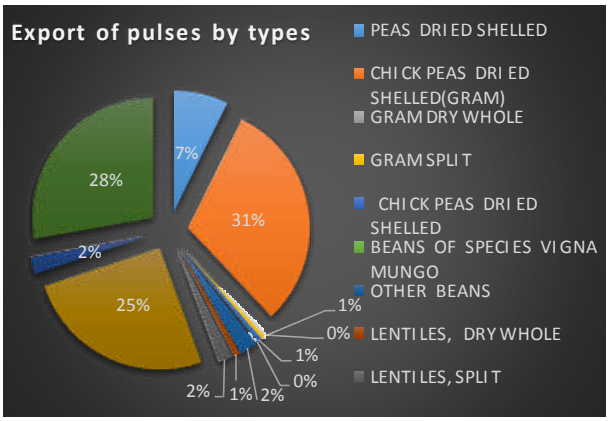
Percentage of Pulses Exports by Years: The above graph shows that the highest ratio of exports were taken place at the period of 2005-06 i-e about 49% of total 11 years exports then 18% of this period is covered by

2004-05 years' export, 21% of total time periods export is contributed by 2003-04 and thereby remaining years exports contributes a little part within this 11 years' export. This graph also indicates that pulses exports were higher in 2005-2006 which then declines by steady downward up to 2013.

Most Frequently Used Countries to Export Pulses: The above chart clearly identifies that pulses exports are not limited to some countries and only Kenya and United Arab Emirates represents the highest ration among the above countries i-e about 6% which indicates that Kenya and United Arab Emirates are most frequently chosen countries by Pakistan to export pulses. Then Korea and Saudi Arabia secure second largest portion within chart i.e. about 4.5% and 4.2%. Whereas Germany, Afghanistan, Bahrain Hong Kong and many others secure third greatest ration in frequently chosen countries and remaining other countries comprises about 1% and 2% among all selected countries. The graph specifies that Pakistan exports its pulses to a variety of countries and no regular pattern has been seen in pulses exports history.



Analysis of Pulses Export: This section includes the analyses of pulses exports to describe the effects of various factors on the pulse exports and to explore the positive or negative impact of independent variables on the pulses export.



H_1 = pulses export is predicted by yield, prices, percapita, production, FDI, ODA, gross savings.
EXPORTSt = a + b1 (YIELDt,) + b2 (PRICESt) + b3 (PERCAPITAt,) + b4 (PRODUCTIONt,) + b5 (ODAt) + b6 (FDIt,) + b7 (GROSS SAVINGSt)

RESULTS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.943[a]	.889	.867	100562887.5447	.889	41.005	7	36	.000	.766

a. Predictors: (Constant), GSAVINGS, ODA, PRODUCTION, FDI, PERCAPITA, YIELD, PRICES
b. Dependent Variable: EXPORTS

In the above model summary the R-square represents the goodness of fit i.e. about .889, which means that the explanatory variable/independent variables explains the pulses exports as dependent by 88% along with the very closer adjusted R-square to its corresponding R-square. The closeness of Adjusted R-Square represents the good indication for the model and describes the best fit among the model. However, the DW i.e. .766 is lower than 1.56 as it represents the average positive autocorrelation among the residuals, which is common in time series data and acceptable in cases like this study where data availability of data was difficult and problematic.

This autocorrelation leads to the dependency of time on previous period and reflects the idea that the historical values predict the future values.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	290274172868 6906900.000	7	414677389812 415300.000	41.005	.000[b]
	Residual	364064196647 641470.000	36	101128943513 23370.000		
	Total	326680592533 4548500.000	43			

a. Dependent Variable: EXPORTS
b. Predictors: (Constant), GSAVINGS, ODA, PRODUCTION, FDI, PERCAPITA, YIELD, PRICES

The ANOVAa table specify the significance level of the model i-e 0.000 which less than alpha value, represents the acceptance of hypothesis suggesting that the pulses exports is predicted by yield, prices, production, per capita, FDI, ODA and gross savings. The f value is also greater than 4, indicates that model is useful for prediction.

This hypothesis proving supports the statement that selected independent variables are best predictors of pulses export and thereby any increase or decrease of such variables impose influence on pulses exports.

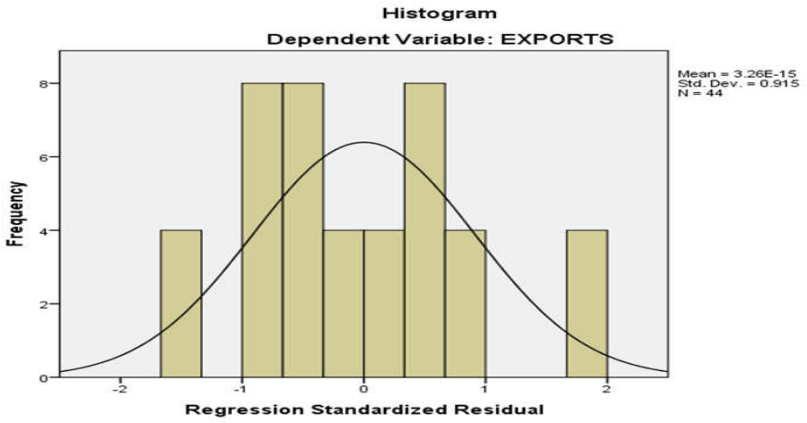
Coefficients[a]

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-776249320.669	653661036.327		-1.188	.002		
	YIELD	1639415.657	179740.588	1.165	9.121	.000	.190	5.272
	PRICES	-333143.130	46215.622	-1.098	-7.208	.000	.133	7.497
	PERCAPITA	-142180132.608	26822909.642	-.589	-5.301	.000	.251	3.984
	PRODUCTION	-8126.871	571.834	-1.406	-14.212	.000	.316	3.161
	ODA	1730198392.654	303288910.078	.462	5.705	.000	.472	2.118
	FDI	535517994.357	127597388.379	.557	4.197	.000	.176	5.697
	GSAVINGS	176373381.440	60619496.858	.511	2.910	.006	.100	9.978

a. Dependent Variable: EXPORTS (Source: This Study)

The above coefficients table summarizes the intensity to which each independent variable effects the pulses exports and the significance of all variables to describe the model specification.

- The probability value 0.000 which is less than 0.05 and t statistics 9.121 greater than 1.96 of YIELD represents the significance of that independent variable within model and suggest that corresponding hypothesis of Yield positively significant to exports is accepted and it positively impacts the pulses export and shows that any increase in yield of pulses would increase the pulses exports.
- Pulse Prices is having the probability value for about 0.000 which is less than 0.05 alpha and t statistics is about -333143.130 greater than 1.96 . The p value and t value represents that the pulses prices are significant and suggest that corresponding hypothesis of Prices negatively significant to exports is accepted but negativity of t value and coefficient beta explains the negative impact of prices on pulses exports. Meaning that any increase in pulses prices would significantly decreases the pulses exports.
- The per capita net availability of all pulses is having the 0.000 probability value along with t value -5.301 grater then 1.96 and explains the significance of the per capita and therefore the corresponding hypothesis of Per capita negatively significant is accepted. The impact of per capita is negative on pulses exports as shown by negativity of coefficient beta of that variable. It reflects that the increase in per capita of pulses would substantially decrease its exports.
- Production of pulses also represents the significant values in p 0.000 and t -14.212 values and suggest that corresponding hypothesis of production negatively significant to exports is accepted. Its coefficient beta shows the negative relation which concludes that potential increase in production would decrease its export. However logically it sounds like inappropriate.
- ODA as macro factor also to have significant value according to rule, its p value 0.000 is less and t 5.705 value is greater to their corresponding value and suggests that corresponding hypothesis of ODA positively significant to exports is accepted. Increase in ODA would significantly increases pulse exports potential by improving exports infrastructure.
- FDI as one of economic indicator not only effects the macro level exports but also effects specifically and hypothesis of FDI positively significant to exports is proved in this case as its p 0.000 and t 4.197 value shows significance. The positivity of coefficient beta represents the positive impact of FDI on pulses exports. FDI expansion would also results in pulses export expansion.



- Gross savings not only logically supports the exports but have proven significant by 0.000 p value and 2.910 t value so that Hypothesis of Gross Savings positively significant to exports is accepted and reflects the positive impact on pulses exports. As the savings increases it lead to increase in pulses exports too.

The above graph shows the normal distribution of residuals as it is one of the linear regression assumption and OLS estimation results in normally distribution of residuals in this case and represents the best fit of model.

CONCLUSION

Pulses are most indispensable food diet for both richest as well as poorest families not only in Pakistan but throughout the world because of their unmated health benefits along with pulses nature as being a cheapest source of obtaining protein made them edible among the all food items but instead of these comprehensive benefits, pulses are still considered as inferior food item and remain neglected by policy makers. Due to negligence and some other reasons, pulses are facing downward trend in many areas. The study also found declining patterns and repetition of trend patterns, very little increase patters were appeared. Export of pulses measures was taken and found that export of total pulses has been declined up to 2013 only the period during 2004-2006, appeared as boosting period for exports and by the time it seemed to reduce up to 2013. Among the all pulses Chickpeas commonly named as Gram was exported most i.e. about 31% of total pulses exports. Kenya and United Arab Emirates are most frequently chosen countries by Pakistan to export pulses and no regular pattern was found in selecting countries to export pulses. In the last exports of pulses were measured to find out factors that predicts the actual exports and it was found that Yield of pulses, Per capita net availability of pulses, Prices, Production, FDI, ODA

and Gross savings are the best predictors of pulses exports, all these factors are statistically significant and having some sort of positive, negative influence on pulses exports. Prices impacts the Exports negatively and by the rise in pulses prices, its exports used to decline over some degree. Similarly, per capita availability and production is also found to have a negative impact on pulses exports. However, Yield, FDI, ODA and Gross savings effects the exports positively.

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