Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.6, No.18, 2015

Time Series Analysis of the Impact of Rising Prices of Inorganic Fertilizers on Field Crops Production: A Case Study of Pakistan

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Abstract:
In this study, we have analyzed the impact of rising prices of inorganic fertilizers on field crops production in Pakistan by using time series 1986 to 2012. Ordinary Least Square method was used to investigate model parameters. The empirical results showed that when price of fertilizer such as Urea, DAP, SSP and SOP increase 1 percent, production of Sugarcane, Maize and Rice were decrease at 91.146,1.943 and 4.443 tonnes respectively. The prices of major fertilizer products during the last five years are increasing. Now, as price increasing, the less used of fertilizers. Therefore, the agricultural productivity is low due to low use of inputs. The main increase was in the DAP price due to a high price on the international market. Now prices of major fertilizers, are Urea, 1700 DAP 4000, NP 2600, and SOP 3700, SSP 1200 per 50Kg bag respectively. Therefore, our study suggest that Government of Pakistan should support small farmers through credit schemes on affordable interest rate and subsidize on agricultural inputs such as fertilizers, seeds and pesticide. It will help in raising farm productivity.
Keywords: Agriculture, Price of Fertilizers, Crop production

1. Introduction

Agriculture is the most important sector of the developing countries like Pakistan. It is the single largest sector in Pakistan. This sector contributes 20.9 percent to the GDP and provides employment to 43.5 percent of the country's labour force. Basically Pakistan is an agricultural country with the world's sixth largest population. The current population of Pakistan is more than 199 million which is growing at the rate of almost 1.49 percent. The majority of population almost 68% lives in rural areas and mostly rural population is engaged in agricultural activities. (Economic Survey of Pakistan, 2014-15) .Fertilizers is major agricultural inputs which yield high and quick returns. As an expensive input its balanced use enhances yield from 30 to 50 percent in different crop production. Nutrient wise one kg of fertilizer produces about 8 kg of cereals (wheat, maize and rice), 2.5 kg of cotton and 114 kg of stripped sugarcane. Almost 100% soil in Pakistan is deficient in nitrogen; 80 to 90 percent is deficient in phosphorus and 30 percent in potassium. However, balanced fertilization is defined as the rational use of fertilizers and other inputs for best possible supply of all essential nutrients for maximum crop yield. Fertilizers are not cheap and therefore, it is essential that they should be efficiently and effectively used to produce maximum output so that farmers get the best results from their expenses. Fertilizers are used when the soil fails to supply the basic nutrients required for adequate growth. According to a (NFDC;1999) report, balanced use of fertilizers increased the yield of wheat by 77%, sugar cane by 100%, rice by 25-100% and cotton by 400%. The use of fertilizer in Pakistan has been increased during last five decades. The government of Pakistan recognized the importance of fertilizer as a major input in 1952 and first introduced it in 1953/54, when it sold 72000 tons. The focus was on introducing and encouraging the use of fertilizers through simple fertilizer trial and demonstration on farmers' fields. First prices were fixed by the government since then the use of fertilizer has been very rapidly increased. The government of Pakistan imposed a 15 percent GST (general sales tax) on all fertilizers in 2001, thus prices increased. However, in 2013-14average retail sale prices of major fertilizers, Urea and DAP are 3,640.0and 1,827.0 per 50Kg bag respectively. The supply sources of fertilizer in Pakistan are domestic production and imports. Those manufactured locally include Urea, Calcium Ammonium Nitrate (CAN), Ammonium Sulphate (AS), Single Super Phosphate (SSP) and Nitrophos (NP). All other fertilizers are imported. The average farm size in Pakistan is too small. Farmers have become so dependent on fertilizers for their crop production that they have been left with no other choice without the balance use of fertilizer. With increasing prices the farmers cannot afford to purchase these inputs. Therefore farmers move to the banks or to other financial institutions to get loans to purchase inputs. Most of the poor farmers get loans from landlords, input dealer, commission agent and shopkeeper who charge high interest rate.

The main objective of this study is to evaluate impact of rising prices of inorganic fertilizer on field crops production in Pakistan and to find out the alternative ways of the input induced by rising prices, and further more sustainable productivity in agriculture. However, this study consists of various sections. This section is about the study introduction. Section two consists on review of literature. Section three consists of methodology and data source. Section four consists of results and discussion. Finally section five consists of conclusion and policy recommendation.

2. Literature review

A few studies have been documented regarding the impact of rising prices of fertilizers on crops production in Pakistan over the years.

Wanyama *et al (*2009). Have analyzed that increasing agricultural productivity in the Sub Saharan Africa especially in Nigeria is an urgent necessity; and one of the fundamental ways of improving agricultural productivity can be achieved through use of inputs such as seed, fertilizer, pesticide and introduction of modern agricultural technologies.

Chianu and Tsujii (2004) have tried to found that in Nigeria the probability of adoption of fertilizer increases with increase targeting of farmers from guinea savanna zone, younger farmers, better educated farmers and farmers who diversified into many crops.

Kelly (2006) have analyzed that factors affecting demand of fertilizer in sub Saharan Africa and the researcher investigated that price of fertilizer, output price of crops, and prices of other inputs that substitute for fertilizer are factors that affect fertilizer demand in the region.

Fufu *et al.,* (2006) tried to found that on determinants of fertilizer use on maize farms in Eastern Ethiopia. They found that age, farmer's perception of price change, and rainfall expectation are significant factors that affect fertilizer use among maize farmers.

Amanze *et al.,* (2010) in Nigeria also investigated that output of crop, level of education, farm size and price of fertilizer were important factors influencing farmers' use of fertilizer in arable crop production while gender, age and household size were not.

Tomich *et Al.* (1995) state that the role of fertilizers for increased agricultural production in developing country is well established. Some argue that fertilizer was as important as seed in the Green Revolution contributing as much as 50% of the yield growth in Asia.

Hopper and FAO (1993, 1998). State that one-third of the cereal production worldwide is due to the use of inputs such as improved seed and fertilizer and related factors of production.

Dickson, (2004) have tried to explore in order to increase agricultural productively in Nigeria. The researcher state that Nigeria agriculture sector needs to embrace science based technology and use of inputs such as fertilizer, high yield seed varieties and pesticide. Since, Land expansion is limited, without agricultural modern technologies and inputs, agricultural production will decrease.

DFIS, (2001) according of this paper series showed that the an economic of developing countries are depends on agriculture sector. However, there is strong relationship between agricultural productivity and poverty reduction.

Bum, (2002) have tried to found that Malawi's experience. Malawi's most of dependent on tobacco for export has been a cause for concern. The Government of Malawi's is promoting increased in use of fertilizer to make foods crops and other crops for export earnings.

Alam and Khan, (1999). State that fertilizer is a key player to enhance crop production by upgrading soil fertility. It also serves as a key for securing the food requirements of a country. None of the country has been able to boost agricultural productivity without making expansion in the use of chemical industry. Balanced fertilization refers to application of essential nutrients of plant, chiefly the major nutrients-Nitrogen (N), Phosphorous (P) and Potassium (K) in optimal quantities through accurate method and application time in precise proportion.

Afzal and Ahmad, (2009).have observed that balanced fertilization leads to enhance the yield of crops, quality of crops and farm income. Further it serves as a remedy to correct soil nutrient deficiencies and helps in maintaining the soil fertility. But it can also be observed that in-spite of increased use of fertilizers overtime in Pakistan; productivity of crops could not be increased.

According to Quddus et al, (2008). The use of commercial fertilizers in Pakistan was initiated in 1952-53, and its consumption was only 1,000 nutrient tonnes of N whereas phosphorus was introduced in 1959-60 with an initial off-take of 100 nutrient tonnes. Potash fertilizer usage was started in 1966-67 with a volume of about 120 nutrient tones

Meanwhile Govt. of Punjab (2011).These trends of fertilizer usage gave emphasis to the significance and function of fertilizer in the national economy. Currently, the consumption of fertilizer in Punjab province was about 3054 thousand N/Tones in the year 2010-11.

Rashid, Afzal and Ahmad (1994, 2009). State that at present fertilizer usage in the country is imbalanced. There is a rapid increase in the consumption of nitrogenous (N) fertilizer than those of phosphate (P_2O_5) and potash (K_2O) fertilizers during the last 4 decades, thus leading to severe imbalance between N, P and K nutrients

Solaiman and Ahmad (2006) have observed that rapid rise in nitrogen consumption can be ascribed to a range of economic and technical factors. Urea which is the chief source of nitrogen is cheaper, provides rapid crop response and locally accessible. In contrast, phosphate and potash fertilizers are pricey and imported from other countries

3. Methodology and Data Source

In this study, time series data was use to evaluate impact of rising prices of inorganic fertilizers on fields crops production in Pakistan for the period of 1986-2012 and to find out the alternative ways of the input induced by rising prices, and further more sustainable productivity in agriculture. Time series data was taken from Economic survey of Pakistan (2011-12). On other hand, we have selected five types of fertilizers which including Urea, DAP NP, SOP and SSP (Single Super Phosphate) were explanatory variables and crops such as wheat, cotton, rice sugarcane, Maize were dependent variables.

3.1 Framework of analysis

In this study, time series data was used to evaluate the impact of rising prices of inorganic fertilizers on field crops production in Pakistan. Regression analysis and elasticity function has performed to get desired result from the study. The model can be specified as follows:

$\ln y^{i}_{t} = \beta_0 + \beta_1 \ln_{UREAt} + \beta_2 \ln NP_t + \beta_3 \ln SSP_t + \beta_4 \ln DAP_t + \beta_5 \ln SOP_t + \varepsilon_t$

Y is production of crops, its unit is tones / hectare and t denote year, and i denote type of crops, likes i={ Wheat, Rice, Maize, Sugarcane, Cotton} .ε_t= error term.

$$\text{Elasticity}_t = \frac{dy}{dx} = \frac{Y_t - Y_t - 1}{X_t - X_t - 1}$$

When elasticity of X^t increases [1] % how much per cent will change inyt.

Area under each crops $a_1+a_2+a_3+a_4+a_5=A$

A denoted area of each crops a_1 wheat, a_2 rice, a_3 maize, a_4 sugarcane and a_5 cotton

$$\frac{a_1}{A}P_W + \frac{a_2}{A}P_r + \frac{a_3}{A}P_m + \frac{a_4}{A}P_s + \frac{a_5}{A}P_c = Averageproductionweighted$$

4. Results and Discussion

The table 1 shows the empirical results. Urea, NP (Nitrophos), SSP (Single Super Phosphate), DAP (Di-Ammonium phosphate) and SOP (Sulphate of Potash) were taken as explanatory variables from fertilizers, whereas five different major crops such as wheat, cotton, rice sugarcane and maize were taken as dependent variables from crops. Regression analysis was conducted to determine the relationship of rising prices of inorganic fertilizer on crops production in Pakistan. In our sample, the mean price of Urea was 414 Rs and the mean value of rice and maize crops were 4443, 1943 tons respectively, however the empirical results showed that when the prices of Urea increase1 percent caused to the production of rice and maize decrease by 4.443 tons and 1.943 tons. Whereas, with 1 per cent increase in the price of Urea there was no significant findings recorded on wheat, cotton and sugarcane crops production. The1percent increase in the price of NP also had no significant effect on these crops production. Moreover, the mean price of DAP was 925 Rs and the mean value of sugarcanewas 45573 tons, so the empirical results indicated that when the price of DAP increase 1 percent the sugarcane production decrease by 91.146 tons. By contrast robust findings were recorded for SSP and SOP fertilizers the mean price of SSP and SOP were Rs 308 and Rs 814 and the mean value of wheat rice and cotton were 18,379, 4,443 and 1,771 tonnes respectively. However, the price of SSP and SOP has significantly affected on wheat, rice and cotton crops production. When the price of SOP fertilizer increased by 1 percent; the wheat, rice and cotton crops production increased by 36.758, 13.329, 3.542 tons respectively. Furthermore, with a percent increase in price of SOP, both rice and maize each of crop production was significantly increased by 4.443, 1.943 tons respectively.

Figure 1 Average production weighted

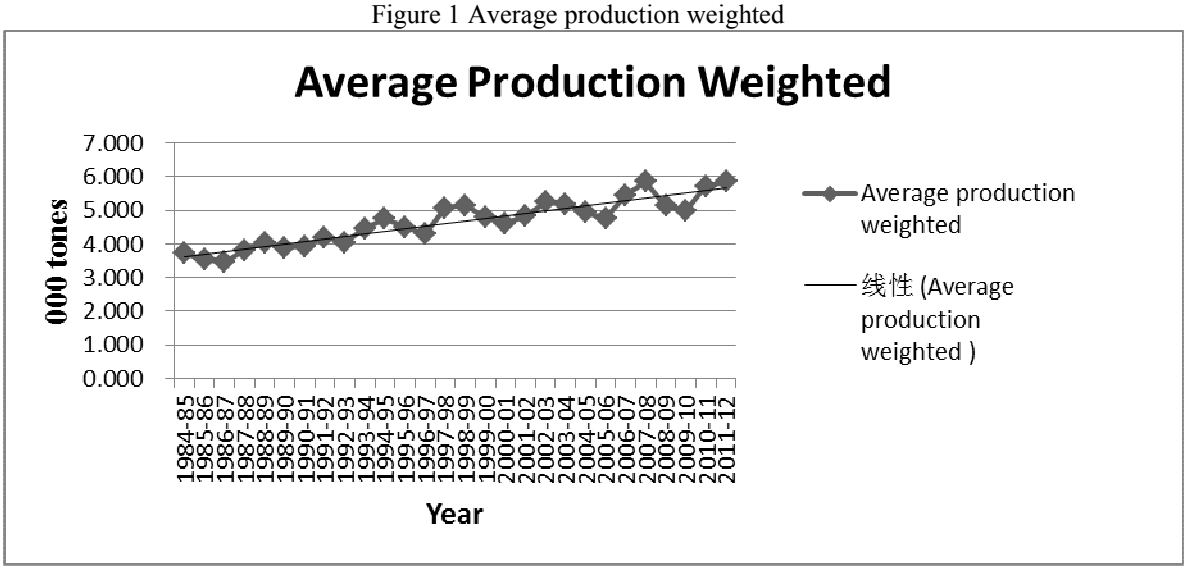
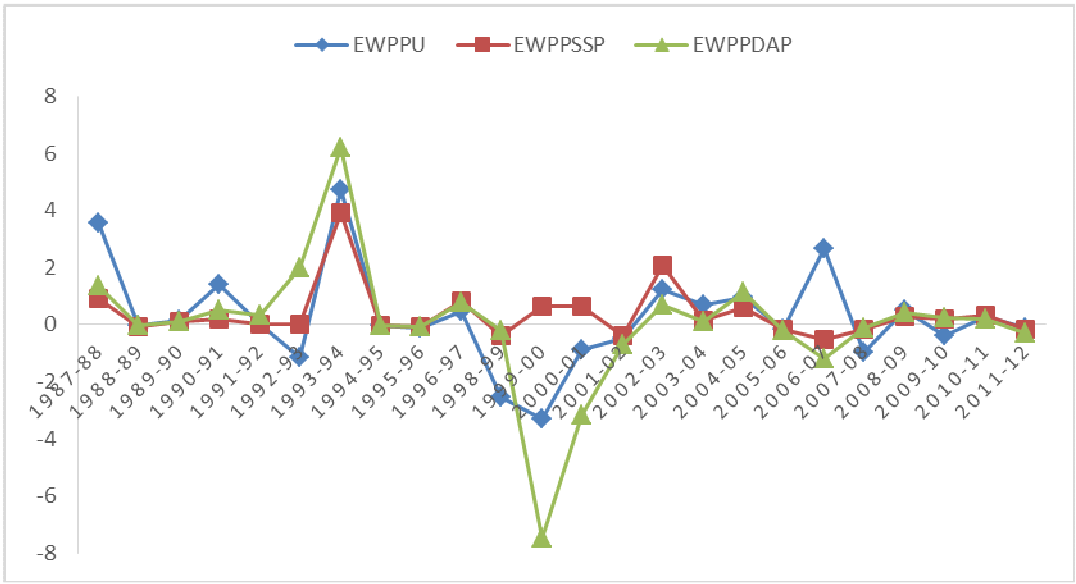
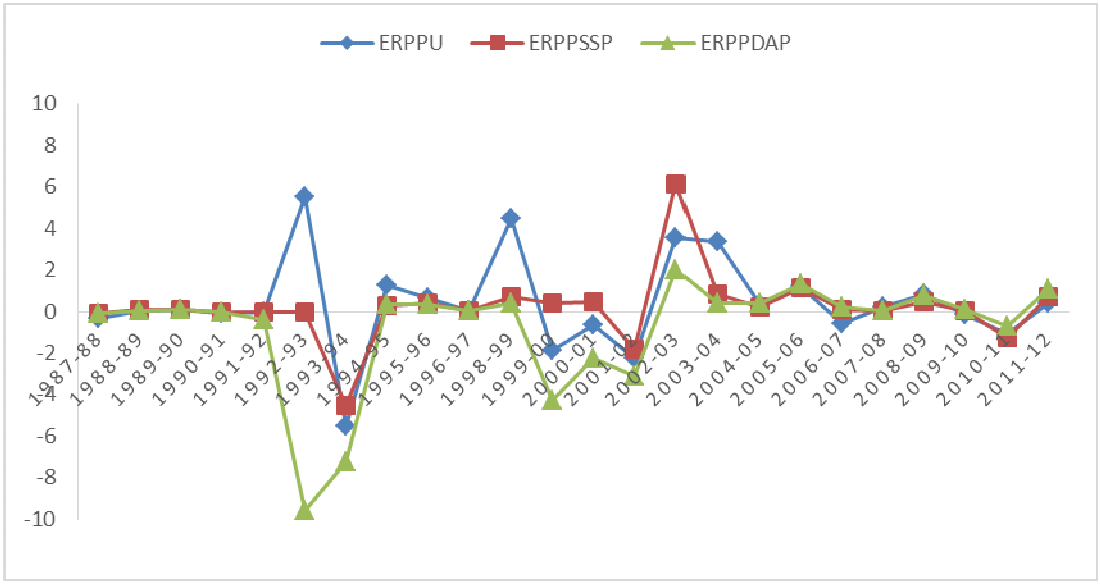


Figure 1 showed fluctuating trend of average production weighted in the years of 1986-2012. The figures 1 elucidate that average production weighted in 2007-08 the max value of average production weighted of all crops was 5.851 tons recorded. While during 1986-87the minimum value of average weighted production of all crops was 3.453 tons. From the time perspective, although the average production weighted was fluctuate and the whole trend was increased.



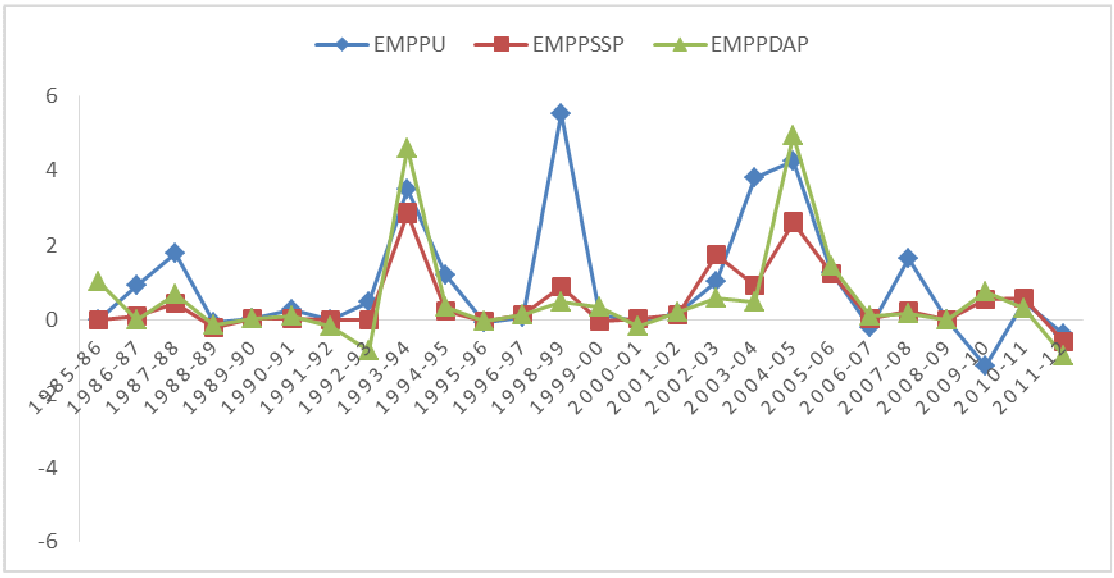
Note: EWPPU: Elasticity of Wheat production and Price f Urea
EWPPSSP: Elasticity of Wheat production and Price of SSP
EWPPDAP: Elasticity of Wheat production and Price of DAP

Figure 2 showed fluctuating trend of wheat production in the years of 1986-2012. The curve elucidate that the elasticity in wheat production declined at most by 3.285% with respect to one percent increase in urea price in 1999-00.However, wheat production was declined at least 0.047 %in 1994-95.Moreover, as the price of SSP was increased by 1 % the elasticity in wheat production decreased at most 0.529 %during 1994-95.Whereas, in 1994-95 with increasing price of SSP by one percent, the elasticity in wheat production declined at least 0.010%. While, in 1999-00 price of DAP was increased by 1% the elasticity in wheat production was declined at most by 7.497%. Moreover, in 1994-95 price of DAP increased by 1%, the elasticity in wheat production was decreased at least by 0.014%.



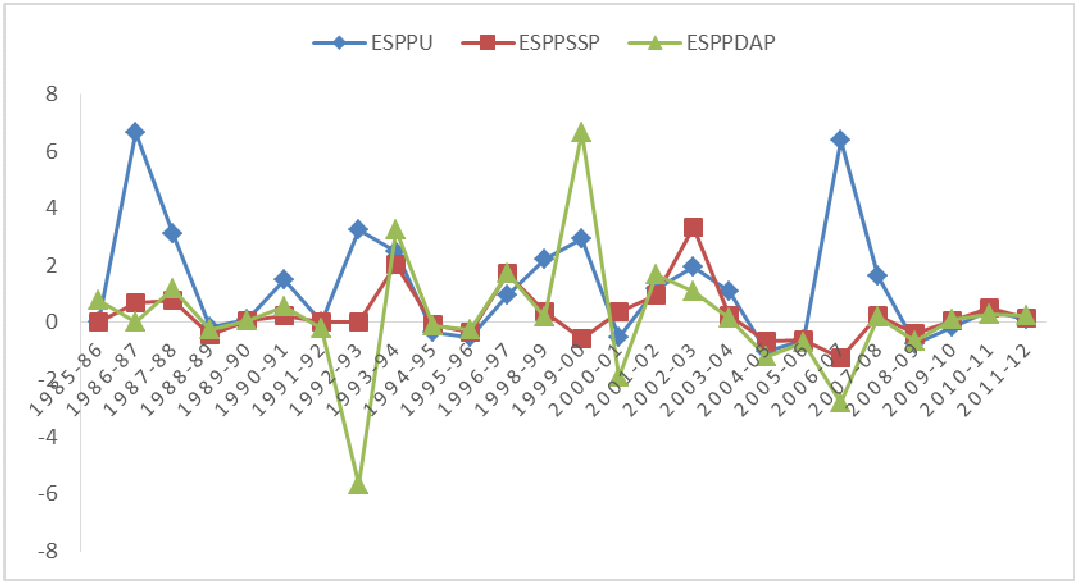
Note: ERPPU: Elasticity of rice production and Price f Urea
ERPPSSP: Elasticity of rice production and Price of SSP
ERPPDAP: Elasticity of rice production and Price of DAP

Figure 3 showed fluctuating trend of Rice production in the years of 1986-2012. The curves illuminate rice production declined at most by 5.514 % with respect to 1% increase in urea price in 1993-94. Moreover, in 1990-91 price of urea was increased by 1% the elasticity in rice production declined at least 0.102%.Whereas, in 1993-94 price of SSP was increased by 1% the elasticity in rice production declined at most 4.556%.While, during 1990-91 price of SSP was increased by 1% the elasticity of rice production decreased at least 0.015%.Moreever, price of DAP increased by 1 % in 1992-93. The elasticity of rice production declined at most 9.591%. Whereas in 2010-11 price of DAP increased respect to 1% the elasticity in rice production declined at least 0.07%.



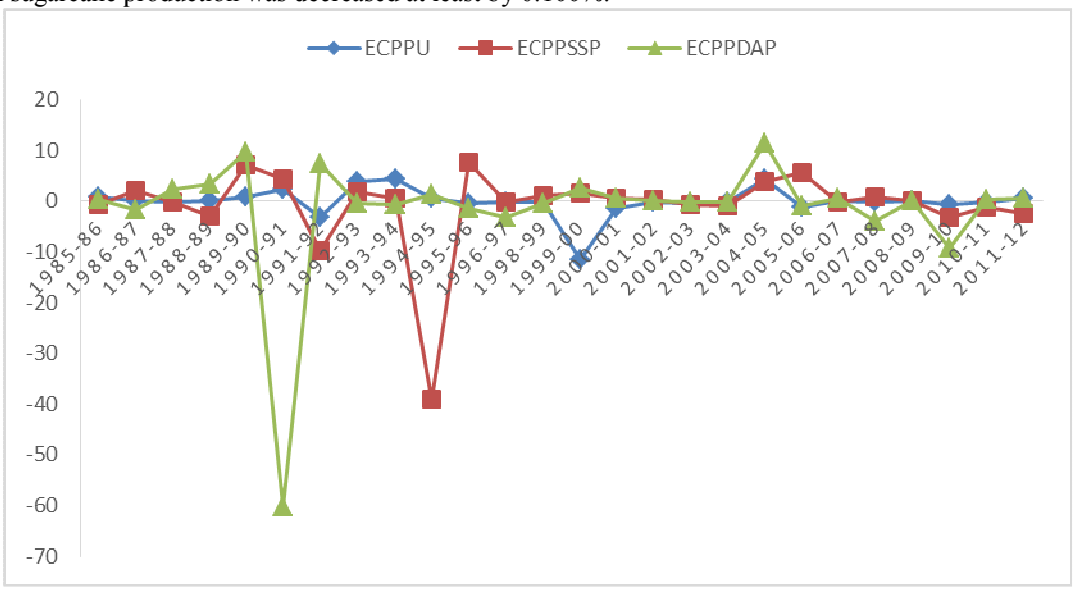
Note: EMPPU: Elasticity of maize production and Price f Urea
EMPPSSP: Elasticity of maize production and Price of SSP
EMPPDAP: Elasticity of maize production and Price of DAP

Figure 4 showed fluctuating trend of maize production in the years of 1986-2012. The curve elucidate that the elasticity in maize production declined at most by 1.251% with respect to one percent increase in urea price in 2009-10.However, maize production was declined at least 0.011 % in 2008-09.Moreover, as the price of SSP was increased by 1 % the elasticity in maize production decreased at most 0.604 %during 2011-12.Whereas, in 2008-09 with increasing price of SSP by one percent, the elasticity in maize production declined at least 0.006%. While, in 2011-12 price of DAP was increased by 1% the elasticity in maize production was declined at most by 0.971%. Moreover, in 2008-09 price of DAP increased by 1%, the elasticity in maize production was decreased at least by 0.0010%.



Note: ESPPU: Elasticity of sugarcane production and Price f Urea
ESPPSSP: Elasticity of sugarcane production and Price of SSP
ESPPDAP: Elasticity of sugarcane production and Price of DAP

Figure 5 showed fluctuating trend of sugarcane production in the years of 1986 -2012. The curve illuminate that the elasticity in sugarcane production declined at most by 1.035% with respect to one percent increase in urea price in 2004-05.Moreever, sugarcane production declined at least 0.180%in 1988-89.However, as the price of SSP was increased by 1 % the elasticity in sugarcane production decreased at most 1.258 %during 2006-07.Whereas, in 1994-95 with increasing price of SSP by one percent, the elasticity in sugarcane production declined at least 0.073%. While, in 1992-93 price of DAP was increased by 1% the elasticity in sugarcane production was declined at most by 5.689%. Moreover, in 1994-95 price of DAP increased by 1%, the elasticity in sugarcane production was decreased at least by 0.100%.



Note: ECPPU: Elasticity of cotton production and Price f Urea
ECPPSSP: Elasticity of cotton production and Price of SSP
ECPPDAP: Elasticity of cotton production and Price of DAP

Figure 6 showed fluctuating trend of cotton production in the years of 1986 -2012. The curve elucidate that the elasticity in cotton production decreased at most by 11.593 with respect to 1% increase in urea price in 1999-00.However, cotton production was decreased at least 0.083 % in 2003-04 .Moreover, as the price of SSP was increased by 1 % the elasticity in cotton production declined at most 39.085 %during 1994-95.Moreever, in 2006-07 with increasing price of SSP by 1%, the elasticity in cotton production declined at least 0.129%. While, in 1990-91 price of DAP was increased by 1% the elasticity in cotton production was declined at most by

60.204%. Moreover, during 2003-04 price of DAP increased by 1%, the elasticity in cotton production was decreased at least by 0.196%.From our analysis it is shown that when prices of fertilizer increased rapidly, production of all crops also declined.

5.1 Conclusion and Policy implication

Using the time series data from the period of 1986-2012, we have analyzed the impact of rising prices of inorganic fertilizers on field crops production crops in Pakistan. It is proved that fertilizer use, yield higher productivity and a part of the gains in productivity is attributed to the more balanced and efficient use of fertilizers. We have taken the time series data, which shows that the agricultural production is highly dependent on fertilizer use and the balanced use of fertilizer depends on its prices. The empirical results showed that when the prices of agricultural inputs such as Urea, DAP, SSP and SOP increased and production of crops declined because our farmers cannot afford to purchase these inputs at high price. The prices of major fertilizer products during the last five years are increasing. The main increase was in the Urea and DAP price due to a high price on the international market. Therefore farmers had limited access to sufficient fertilizer in order to increase crop productivity. The fertilizers prices are strongly linked with energy and natural gas availability in the country and its prices have been increased in recent years, because of the huge pressure on gas consumption and shortage of energy sources. This upward trend is likely to continue steadily in the future. At the same time, the use of fertilizer is critical in agricultural development and is likely to become even more critical in the future. As a result, the cost of production will increase because the fertilizer becomes expensive due to increase in prices. Consequently, farmers will look for alternative and cheaper in appropriate sources of fertilizer such as SSP and SOP. From our analysis it is shown that the prices of fertilizer substantially increased in recent years. Fertilizer prices and crops production are inversely related. From these results it seems that fertilizer facilitates the agricultural development by increasing crops productivity.

5.2 Policy Implication

The increasing shortage of natural gas, oil and energy sources has raised the prices of fertilizer, by negatively affecting domestic fertilizer production, which further increased fertilizer imports in Pakistan. Therefore, chemical fertilizers which are very expensive, should be used judiciously

Multiple cropping patterns should be promoted by the inclusion of legumes with cereals more likely other developing countries such as China, Thailand, Malaysia and some African countries to maintain soil health with safer environment, and improve productivity in long terms by reducing the demand for fertilizers.

Due to the unavailability of Agricultural credit on flexible terms and conditions, mostly small farmers purchase fertilizer from black market and from landlords, input dealer, shopkeeper at the high rate of interest. This further increases their cost of production without increasing their net return from farms. Therefore all commercial banks, Micro finance institutions should supply short- term, medium term and long - term Agricultural Credit at flexible terms and conditions; so the farmers can purchase the appropriate fertilizer to increase crop productivity.

Financial institutions should provide up to-date information through electronic media (Television and Radio) and print media (Newspaper, magazines and pamphlets) about agricultural credit in rural areas awareness in the farmers community so they have an easy access to the best financial services.

The government of Pakistan also needs to control the soaring prices of fertilizers. In contrast it will have a serious impact on agriculture sector in the decades to come; consequently crop production will be declined further in the future agricultural.

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Appendix

Table 1: Impacts of Fertilizer's rising prices on Field Crops（Empirical Results）

Variables	Wheat	Rice	Maize	Sugarcane	Cotton
Urea	-0.001	-0.001**	-0.002**	-0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
NP	0.001	0.001	0.002	0.003	-0.001
	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)
SSP	0.002*	0.003***	0.001	0.001	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
DAP	-0.001	-0.001	-0.002	-0.002*	-0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
SOP	0.000	0.001**	0.001**	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	9.646***	8.215***	7.334***	10.500***	7.310***
	(0.078)	(0.044)	(0.111)	(0.092)	(0.070)
Observations	28	28	28	28	28
R-squared	0.742	0.833	0.804	0.506	0.563

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2: Fertilizer consumption (kg ha^{-1}) in developed, developing and African countries from 2002 to 2012

Country name	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Germany	220	220	215	209	194	222	160	181	212	191	199
France	211	223	212	192	190	209	153	121	151	141	137
Japan	334	335	354	348	333	350	278	239	260	268	259
United Kingdom	319	314	287	273	254	254	208	240	252	239	234
Italy	171	178	181	172	177	190	143	120	123	134	151
Netherlands	429	438	357	338	353	302	268	238	293	247	310
China	383	383	358	427	468	479	533	602	580	558	648
Indonesia	124	131	131	144	158	181	185	182	182	198	195
India	100	105	115	128	136	143	153	167	179	178	164
Korea, Rep.	412	469	525	643	470	511	441	332	336	335	481
Pakistan	141	146	158	175	178	170	172	208	198	186	167
Malaysia	1177	1304	1628	1457	1662	1837	2027	1517	2197	2063	1571
Turkey	73	84	86	87	92	90	72	105	96	103	106
Thailand	111	149	132	113	117	125	131	122	162	162	153
Bangladesh	189	160	171	198	193	184	200	189	213	271	279
Algeria	10	6	25	7	13	15	9	14	19	17	22
Benin	16	1	0	0	0	0	0	7	9	5	19
Cambodia	6	4	5	8	8	9	7	10	12	15	17
Ethiopia	17	6	10	11	11	16	17	18	22	21	24
Ghana	4	7	13	6	20	18	15	19	19	13	35
Kenya	27	33	28	34	33	36	33	32	30	45	44
Maldives	6	8	10	30	118	87	22	89	82	123	138
Mongolia	6	6	8	5	9	9	8	12	18	23	25
Nigeria	5	6	5	7	10	4	6	5	6	4	5
Sudan	3	3	5	3	3	4	4	8	11	9	11
Togo	5	7	3	10	5	6	0	6	9	10	5
Tanzania	4	4	5	6	5	5	5	8	7	8	4
Uganda	1	2	1	1	1	1	3	2	2	2	2
Zimbabwe	36	40	23	22	32	27	22	29	34	29	29

Source: Food and Agriculture Organization, electronic file and website. (World Bank Indicators)

Table 3: Production of major crops (Tones) and Prices of fertilizers

Year	Wheat	Rice	Maize	Sugarcane	Cotton	Urea	NP	SSP	DAP	SOP
1985-86	13,923	2,919	1,009	27,856	1,208	128	110	40	133	40
1986-87	12,016	3,486	1,111	29,926	1,309	128	110	40	146	50
1987-88	12,675	3,241	1,127	33,029	1,468	130	110	46	146	50
1988-89	14,419	3,200	1,204	36,976	1,426	135	119	53	161	60
1989-90	14,316	3,220	1,179	35,494	1,456	165	137	58	185	72
1990-91	14,565	3,261	1,185	35,989	1,637	185	150	68	217	107
1991-92	15,684	3,243	1,203	38,865	2,181	195	173	93	249	150
1992-93	16,157	3,116	1,184	38,059	1,540	195	173	93	272	150
1993-94	15,213	3,995	1,213	44,427	1,368	205	196	93	264	195
1994-95	17,002	3,447	1,318	47,168	1,479	210.1	202.6	95.8	269	195
1995-96	16,907	3,967	1,504	45,230	1,802	235	250	150	379	195
1996-97	16,651	4,305	1,491	41,998	1,594	267	320	183	479	331
1997-98	18,694	4,333	1,517	53,104	1,562	340	384	211	553	532
1998-99	17,858	4,674	1,665	55,191	1,495	346	457	234	665	541
1999-00	21,079	5,156	1,652	46,333	1,912	327	464	298	649	543
2000-01	19,024	4,803	1,643	43,606	1,825	363	468	253	669	682
2001-02	18,227	3,882	1,664	48,042	1,805	394	519	280	710	765
2002-03	19,183	4,479	1,737	52,056	1,737	411	539	287	765	780
2003-04	19,500	4,848	1,897	53,419	1,709	421	622	316	913	809
2004-05	21,612	5,025	2,797	47,244	2,426	468	704	373	1,001.00	996
2005-06	21,277	5,547	3,110	44,666	2,214	509	710	407	1,079.00	1,170.00
2006-07	23,295	5,438	3,088	54,742	2,187	527	670	334	993	985
2007-08	20,959	5,563	3,605	63,920	1,982	581	1,294.00	560	1,931.00	1,495.00
2008-09	24,033	6,952	3,593	50,045	2,010	751	1,700.00	874	2,578.00	2,175.00
2009-10	23,311	6,883	3,262	49,373	2,197	806.3	1,456.70	724.5	2,267.20	2,300.30
2010-11	25,214	4,823	3,707	55,309	1,966	1,035.00	2,108.00	896	3,236.00	2,807.00
2011-12	23,437	6,160	2,797	58,396	2,310	1,718.00	2,691.00	1,260.00	4,054.00	3,797.00

Source: Economic Survey (GOP, 2012-13)

Table 4: Imported fertilizers during 1889-90 – 201011

Year	Urea	DAP	Total product imported (tones)
1989-90	3710	529	
1990-91	541	499	1040
1991-92	570	554	1124
1992-93	525	755	1280
1993-94	206	1162	1368
1994-95	0	480	480
1995-96	389	598	987
1996-97	704	828	1532
1997-98	264	904	1168
1998-99	574	774	1348
1999-00	114	819	933
2000-01	86	373	459
2001-02	0	919	919
2002-03	0	1124	1124
2003-04	0	1046	1046
2004-05	307	811	1118
2005-06	825	1171	1996
2006-07	281	935	1216
2007-08	181	1072	1253
2008-09	905	206.7	1111.7
2009-10	1525	1080	2605
2010-11	**635**	**492**	**1127**

Source: National fertilizer development centre (NFDC), Islamabad Record of National Fertilizer Development Centre, Planning and Development Division, Islamabad Federal Bureau of Statistics, Karachi Census of Agriculture,

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