Analyzing Effects Reduce of fertilizer subsidy on beet producers' Welfare Fars Province

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Abstract: The purpose of this study the effects of fertilizer subsidy removal on the welfare of producers of beet in Fars Province are. The research data and information required by statistical yearbook and databases and also completed questionnaires from 65 beet farmer in Marvdasht obtained by Eviews software Excel and were analyzed. The results of this study show that removal of fertilizer subsidies should be gradual because it removed at once as fertilizer subsidies lead to sudden increase production costs and small farmers and novices who do not usually have the financial resources, are strongly affected may lead to even remove them is in production.
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Introduction

Subsidy to agricultural inputs with the aim of reducing cost of production and food security for the population in developing countries always been common. Among the various inputs, Fertilizer in Iran like many countries with highest prevalence was subsidized. So that in 1385, more than 9 / 6 trillion Rials as subsidy allocated to Fertilizer that about 76 percent of the total cost includes the Fertilizer (Supportive Services, 2007). For long periods with the aim of providing subsidy Fertilizer of interest were mentioned, but with the expansion of its distribution problems emerged Fertilizer subsidy was questioned. These problems can include high financial burden for government, creating false comparative advantage in some economic activities, waste of scarce investment resources, reducing environmental degradation and competition named. However, the distribution of subsidized Fertilizer conflict between positive and negative consequences, and there are different theories. (FarajZade and Najafi 2010). Being a fertilizer subsidy ability of the major reasons for this pattern of fertilizer, he said. Sources of supply bottlenecks in domestic production of fertilizers and global oil prices in the past two years, price increases universal inputs and increasing the rent of the global marine transport was the same for the subsidy to such dramatic increased and this, the government subsidy was faced with the problem, so The year 2004 of about 1150 billion Rials subsidy required and not provided in 2005 approved the sum of about two thousand billion Rials with what was requested, was the distance (Supportive Services, 2006).

Without the use of fertilizers, agriculture will not be possible with high efficiency. The use of fertilizer can lower both negative environmental effects to be associated with: the first is that this effect can be reduced or acreage due to low yield per hectare due to the non-application of fertilizers increased the cost per unit area is followed, makes no mentioned product is grown. Second, a wide area with high potential, to produce more and increase productivity, the need to use chemical inputs and therefore one has the most effective ways to motivate more use of fertilizers subsidy to these inputs is (Amoli and et al, 2007). Fars province is one of the poles agricultural countries with good investment and can be programmed as one of the main centers of production and export of agricultural products to act. Beet cultivation in the province in 85-86 18178 ha and production levels in the crop year equal to 528,275.62 tons per hectare is 29061.26 kg. 86-87 in the amount of reason to the 1585 acres under cultivation and production declined against the 47,823.16 tons and Farming in beet production rates are 87-88 under cultivation was 6,141 hectares, equal to 165,161 tons against which the performance of 26,894.81 kg is ha. (Jahad keshavarzi).

Theoretical literature:

Antte and Aitah (1983) using cross sectional data (1977-1976) about 153 farms located in East Egyptian samples and using a cost function to estimate the elasticity of demand Trans log factors of production and test technology structure in rice farming began. The results showed that demand for production factors (eg, fertilizer) to prices of production factors on the black market is sensitive. It also became clear that farmers completely rational act and as we deem necessary, more or less than the quota based on the black market price of fertilizer your intended use must. Ready and Deshpande (1992) to study the combined positive and negative

effects of fertilizer subsidy removal began in India. The findings of this study showed that areas with high growth in the subsidy could be gradually reduced to fertilizer, but in areas with low growth rate of subsidy distribution among the low, subsidized rate increase is necessary. However, these studies implicitly that the distribution of subsidies and government support of Fertilizer emphasized, but some other studies, in total agreement to create the desired outcomes mentioned in the application process fertilizer, market reform and market liberalization suggest Fertilizer have. Kohansal (1993) in their study of the effects of fertilizer subsidy removal in Fars province was investigated. The results showed that input price liberalization policies in agriculture should be done step by step until farmers have enough time to adapt to new conditions and thus have incurred losses to the agricultural sector is reduced. Wagle (1994) attempted to estimate the total demand for fertilizers functions and private investment in agriculture to India. In this study, short-term price elasticity demand and long-term fertilizer 39/0- 97/0- obtained showing that demand for fertilizers in India in the study period price changes, is very sensitive. Low price elasticity demand to expand areas under cultivation and the blue areas covered seeds and species with high yield were attributed (Persian). Eliyasiyan and Hosseini (1996) to study the effects of subsidy removal on the application of agricultural inputs including fertilizers, pesticides, seeds, machinery, water and related consequences on the income of farmers increased exchange rate and therefore the prices paid for inputs have. The results showed that the profitability index of one hectare irrigated wheat crop in 72-71 years after economic liberalization, the equivalent of twice the 71-70 years before the release was. Nikokar (2002) with the effect of removal of subsidies on beet product suggests that removal of fertilizer subsidies should be gradual so the sudden removal because of sudden increase production costs and small-scale farmers who do not usually have the financial reserves , will suffer severely and may even cause the removal of the turntable be produced. Piriaei and Akbari Moghaddam (2005) in a study to investigate the welfare effects of reducing agricultural subsidies in Iran began subsection. Their findings showed that the reduction of subsidies led to subsection welfare of rural and urban households are.

Karimzadegan (2006) with the effects of fertilizer subsidy on consumption of non-optimal in wheat production stated that non-optimal use of fertilizers in wheat production is completely evident. Comparison of production and profits in the current mode with optimal indicate that a return to optimum levels, farmers will earn greater profits and average production will increase.

Research Methodology

Input demand function can be of benefit or cost function, Farmer (agriculture) be extracted, so the input demand function of input prices, product prices and other factors leading to the transfer request input demand function is, is. If the function of extracting a profit on the input demand function is used, tools used for analysis include: the demand inputs of fertilizers and pesticides and the production function operation selected Fars province. Of course, only possible in micro level welfare analysis of selected products among manufacturers is provided. Farm level, using demand function is estimated profit function and then estimates the production of these products, in order to help clarify the inputs of fertilizers and pesticides to produce its effect on revenues, costs and benefits considered Manufacturers this review is in order to achieve production input demand functions, the model provided by Sidhu and Baanante was used (Mousavi and et al 2009). Profit function, we consider the following:

$$\pi = A \prod_{i=1}^{m} P_i^{\alpha_i} \prod_{k=1}^{n} Z_k^{\beta_i}$$

Where:

π : Profit (total revenue minus total cost of production inputs) to help the product price is normal.

P_i: A variable X_i input prices normalized to help Price

α_i : Profit function than the price elasticity of input variable i have.

Z_k : values my input K.

β_i : Income elasticity function to the k value my input.

If the profit function we logarithms, we get:

(2) I have a variable input and contribution to profit in this way we define:

(3)
$$\ln \pi = \ln A + \sum_{i=1}^{m} \alpha_i \ln P_i + \sum_{k=1}^{n} \beta_i \ln Z_K$$

$$s_i = \frac{P_i X_i}{\pi}$$

Considering that the total s_i is equal to one, to obtain input function is sufficient demand for us to demand transparency.

(4) $$s_i = \frac{-P_i X_i}{\pi} = \frac{\partial \ln \pi}{\partial \ln P_i} = \alpha_i$$

Estimating equations with two and four input demand function for the variable i to be obtained as follows:

(5) $$X_i = \frac{\pi}{P_i}\left[\frac{-\partial \ln \pi}{\partial \ln P_i}\right]$$

Profit function now considers the following:

(6) $$\pi = AP_F^{\alpha_1} P_L^{\alpha_2} P_P^{\alpha_3} P_M^{\alpha_4} P_W^{\alpha_5} P_S^{\alpha_6} P_E^{\alpha_7} AC^{\alpha_8}$$

In this function:

π Profit, P_F fertilizer prices, P_L labor prices, P_P price pesticide, P_M machinery prices, P_W water prices, P_S seed prices, P_E product selling prices and AC cultivation (hectares) Host input demand functions extracted.

First, the profit function, take logarithms:

$$\ln\pi = A + \alpha_1 \ln P_F + \alpha_2 \ln P_L + \alpha_3 \ln P_P + \alpha_4 \ln P_M + \alpha_5 \ln P_W + \alpha_6 \ln P_S + \alpha_7 \ln P_E + \alpha_8 \ln AC$$

According to the relation 3, the relationship for each of the four inputs is calculated:

(7) $$S_i = \frac{-P_i X_i}{\pi} = \frac{\partial \ln \pi}{\partial \ln P_i} = \alpha_i$$

Equations with parameters estimated demand function (equation 7) for inputs (fertilizer) can be obtained as follows:

(8) $$X_F = \frac{\pi}{P_F}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

Calculate the demand elasticity of various inputs:

If the logarithms function, 8 we obtained the following relationship:

(9) $$\ln X_F = \ln \pi - \ln P_F + \left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

Top of the relationship between price elasticity of demand for its fertilizer is obtained as follows:

(10) $$\omega_{FF} = \frac{\partial \ln X_F}{\partial \ln P_F} = \frac{\partial \ln \pi}{\partial \ln P_F} - 1 + \frac{\partial \ln}{\partial \ln P_F}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

Likewise, cross gain traction for the same inputs that here only refers to fertilizer and cross elasticity of the above relation is obtained as follows:

(11) $$\omega_{FP} = \frac{\partial \ln X_F}{\partial \ln P_P} = \frac{\partial \ln \pi}{\partial \ln P_P} + \frac{\partial \ln}{\partial \ln P_P}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

(12) $$\omega_{FM} = \frac{\partial \ln X_F}{\partial \ln P_M} = \frac{\partial \ln \pi}{\partial \ln P_M} + \frac{\partial \ln}{\partial \ln P_M}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

(13) $$\omega_{FL} = \frac{\partial \ln X_F}{\partial \ln P_L} = \frac{\partial \ln \pi}{\partial \ln P_L} + \frac{\partial \ln}{\partial \ln P_L}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

(14) $$\omega_{FW} = \frac{\partial \ln X_F}{\partial \ln P_W} = \frac{\partial \ln \pi}{\partial \ln P_W} + \frac{\partial \ln}{\partial \ln P_W}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

(15) $$\omega_{FS} = \frac{\partial \ln X_F}{\partial \ln P_S} = \frac{\partial \ln \pi}{\partial \ln P_S} + \frac{\partial \ln}{\partial \ln P_S}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

(16) $$\omega_{FE} = \frac{\partial \ln X_F}{\partial \ln P_E} = \frac{\partial \ln \pi}{\partial \ln P_E} + \frac{\partial \ln}{\partial \ln P_E}\left[\frac{-\partial \ln \pi}{\partial \ln P_F}\right]$$

And applying tension to obtain the same price for beet: beet production function:

In order to affect productive change in input prices also production function Cobb - Douglas was used. The production function relationship between the product and the expression of specific inputs and the effects of production factors like labor, irrigation and technology on a good product to show that (Mousavi and et al 2009). Production function of Cobb - Douglas in the pattern of this study is as follows:

(17) $$q = AF^{\alpha_1} L^{\alpha_2} P^{\alpha_3} M^{\alpha_4} W^{\alpha_5} S^{\alpha_6}$$

In which the production value of q, A coefficient of fixed amounts to each production elasticity of inputs,

F Fertilizer, L labor, P Sam, M Machinery, W and S water price is the price of seed. In this study, data requirements through interviewing the person and the Yearbook statistics Agriculture Ministry of Agriculture, databases, FAO, Statistical Center of Iran, Central Bank of Iran and Services for support and completion of the questionnaire sample 65-man farmers beet work in crop 87-1388 has been obtained For analysis of EViews and Excel software was used for a hectare of beet product in the table below (Table 1).

Table1. The average amount consumed in a Fertilizer hectare for beet product

Year	Chemical fertilizer									
	phosphate		N		Potash		other		Total	
	amount	Value (kg)	amount	Value (kg)	amount	Value (kg)	amount	Value(kg)	amount	Value(kg)
79-80	206.49	51	388.96	40	18.1	37	19.69	86	633.24	45
80-81	6.272	48	382.24	39	12.65	45	12.2	86	678.98	43
81-82	223.4	55	391.28	50	18.95	50	62.78	267	696.41	71
82-83	269.03	75	391.09	77	21.5	53	9.09	307	717.71	79
83-84	267.97	87	446.04	80	13.93	60	9.98	763	737.92	91
84-85	258.28	69	383.93	65	15.98	54	17.88	378	676.06	75
85-86	220.59	97	603.56	100	105.63	65	41.44	286	971.22	103
86-87	182.6	66	314.09	53	0	0	28.91	91	525.61	60

*Jahad keshavarzi 89

Table2. The average amount spent in institutions for the product of beet acres

Year	seed		animal manure		hoofs					
					herbicides		insecticides		fungicides	
	Amount (kg)	Value (kg)	Amount (ton)	Value (ton)	Amount(kg)	Value(kg)	Amount(kg)	Value(kg)	Amount(kg)	Value (kg)
79-80	16.39	941	0.009	2000	3.962	2483	3.847	2183	0.462	2477
80-81	15.53	2076	0.001	4000	3.076	2242	2.181	3648	0.214	3627
81-82	13.13	1747	0	0	4.273	2239	1.829	1923	0.024	1113
82-83	7.78	5031	0.6	3127	3.91	3103	2.827	3462	0.079	2972
83-84	5.88	22521	0.521	3460	3.088	4113	4.238	3765	0.292	4748
84-85	6.54	13283	0.23	5167	4.07	4966	1.67	50.47	0.32	7625
85-86	4.28	35594	3.682	10561	2.77	5315	2.973	6893	0.104	9023
86-87	21.01	2111	6.37	1250	0.539	5133	0	0	2.44	6134

*Jahad keshavarzi

Table 3. The average price beet

Year	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
Price(kg/r)	25.5	37	52	62	78	97	125	157	175	225	252	303	355	390	420	460	460	620

*Jahad keshavarzi

Conclusion

Table (4) operating profit function for beet product is presented. As this table is also marked signs of all coefficients obtained based on the expected. Toxin variable cost, labor, water and seeds of a significant negative effect of product price on the significant positive benefits have beets and only variables price of fertilizer, machinery and plant level of profits have not had a significant effect. In other According to the information and data obtained are as noticeable to the average amount spent on fertilizer words, the difference between operating profits of only due to all the variables are significant. Mark Price, all negative inputs are obtained. This means that input prices lead to reduced profitability will beet. Also emphasized was the significance level with 10 percent of the variance is not dissonance. Presented is able to clear 68 percent of the changes described in the operating profit to explain. As

stipulated in the variable coefficient has no statistical significance fertilizer therefore the demand sensitivity to price changes will increase costs and will be produced.

Profit function can be seen that the only function of the price of chemical pesticides, the price of labor, water price, and price and sale price beet seed is obtained. As Table (5) is among the inputs used in the production function specified only significant effect of seed production and of course the negative is shown. Positive effect on production of other variables has shown. According to the statistical significance can be said inputs of seed production in the third zone have been used thus increasing the consumption of production inputs is reduced.

Table 4. Beet earnings estimate.

Variable	coefficient	statistics T
Width of source	25.2	2.3
Fertilizer prices	-0.03	-0.21
hoof Price	-0.12	-1.01
Labor cost	-0.17	-1.1
machinery Prices	-0.5	-1.3
Water prices	-0.28	-2.01
Seed prices	-0.66	-1.5
crop Price	2.23	4.01
Cultivation	-0.001	-0.002
statistics	R^2	0.68
	F	4.39

*Research findings

In general, research results indicate that beet production in Fars province, one of the most important agricultural areas is considered and any fluctuation in the production of beet farmer households on welfare affects. Therefore, the results showed in Fars province beet fertilizer subsidy removal due to lack of fertilizer demand sensitivity to price changes that increase profitability and reduce production costs amount to about 22.5 and 16.1 percent respectively are . This means that policies for the optimal price strategy to make adequate intake of this input is not and should complement policies and compensation policies with the input prices (input subsidies) is applied. Finally, the findings summarized recommendations are presented.

1 - Was observed that the reaction against the rise in the utilization of fertilizers is considered very low prices of fertilizers so quickly increase production costs and will need to reduce subsidies should be gradual basis. 2- removal of fertilizer subsidies should be gradual because it removed at once as fertilizer subsidies lead to sudden increase production costs and small farmers and novices who do not usually have the financial resources, are strongly affected may lead to even remove them is in production.

Table5. Results of beet production estimate.

*Research findings

Variable	coefficient	statistics T
Width of source	0.79	3.49
Fertilizer	-2.9	-0.0004
hoof s	0.035	0.253
Labor	0.031	0.007
machinery	0.325	0.03
Water	-0.02	0.011
Seed	3.05	2.37
Statistics	R^2	0.99
	F	2.39

Table 6. Effect of reduced fertilizer subsidies on production costs and operating profits of beet

Reduction of fertilizer subsidy (percent)	15	30	50	removal
Share of fertilizer production costs	11.4	14.3	19.8	25.6
Costs per ha (million Rials)	8.1	8.4	8.9	9.4
increased cost (percent)	7.2	12.4	18.5	22.5
Net income per ha (million Rials)	6.4	6.1	5.9	5.6
Reduced profit (percent)	-2.7	-6.4	-14.6	-16.1

*Research findings

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