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DETERMINATION OF RELATIVE ADVANTAGE OF PRODUCING HYDRO CANOLA IN KHUZESTAN PROVINCE 2012-2013

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ABSTRACT

In this study, the relative advantage of hydro canola in Khuzestan province in the agricultural year of 2012-2013 by using the indicators of domestic resources' cost, social net profit and the ratio of cost to the social profit has been analyzed. The statistics and information needed for this study have been collected from the organization of Agricultural Crusade in the province of Khuzestan that and the foreign Trade calendar. The results of the study indicated that Khuzestan has a relative advantage in the production of hydro canola. Therefore, it is especially important the production of this product will be protected.

Keywords*: Cost of Domestic Resources, the Ratio of Cost to the Social Profit, Relative Advantage, Hydro Canola*

INTRODUCTION

The relative advantage is the central point in business and the indicator of the profit as a result of business in its route. Paying attention to the relative advantage in production activities is one of the most important aspects of planning. Relative advantage becomes meaningful when the international trade happens competitively and freely. In this case, trade and production of products having relative merit will be welcomed more and the producers will have more motivation for the production of such products (crops), (Shafiee and Yazdani, 2010).

Considering the population rise in the last 3 decades, self – efficiency has become a top priority for the Agricultural programs ant the Ministry of Agricultural Crusade. Considering the limitation of production factors, in order to use these factors to the best for our abilities for the purpose of the highest rate of production, the expansion of the land under cultivation and the increase of production in different areas should be done based on relative merit. If thee are plenty of factors for production in a region and it can produce the crop and offer it in the market with a cost lower than other areas of production, that area has, then, priority over other production of that crop. Relative merit is related to the availability of the producing resources and factors, the method of production, the technological progress, force skills and the efficiency of (Shafiee and yazdani, 2010). In the area of analyzing the relative merit, so far, some studies have taken place both in and out of the country. The measurement of the relative merit, for the first time, was done in 1963 by Bruno in 2010. He used the domestic resoures to analyze the relative merit in the clot her industry, assessment f projects and analysis of the cost of social and economic benefits of Substitute policies of imports and the encouragement of exports in the occupied Palestine. After Bruno, (Gonzales *et al.*, 1993), (Mestro, 1995), (Fung, 2004), (Utkulu and seymen, 2004), (Marrewijk, 2005), (Haithan, 2007), (Navarro *et al.,* 2010), (Nicolini, 2011) studied the relative merit of some of the industrial and or agricultural crops of different countries.

In the domestic studies division, (Salami and Pishbahar, 2001) studied the changes in the relative merit's pattern in Iran's agricultural crops. And concluded that Iran has relative merit in the production of most crops. (Najafi and Mirzaee, 2003) studied the relative merit of agricultural products in Fars province. The results of their studies showed that wheat and barley dry farms, sugar cane, sunflower based on the value of foreign exchange of foreign exchange do not have relative merit and tomatoes, cucumbers, potatoes and water lentil possess the highest relative merit**.** (Malekdar, 2005) studied water the production of canola in the province of Mazandaran was economical or not. The calculation of relative merit\s indicator using the political Matrix Analysis (PAM) indicated the existence of relative merit in the production of

Research Article

canola and the useful interventions of the government in the field of and products. Canola is an oil related vegetable whose seed has 40-45 per cent oil and 25-35 per cent protein. Canola oil because of proper mixture of acids in its fat that are not sat ratable and the percentage of acids saturated in fat such as olives, is one of the best cooking oils. The protein in canola is also used in nutrition for the cattle (Emadzadeh *et al.,* 2010).

Because of an increase in the land for cultivation of canola in recent years in Khuzestan province, the relative merit of producing this oil-base seed has been studied.

MATERIALS AND METHODS

Multiple theories exist about the relative merit with a long history. The theory of merit was first brought up by David Ricardo and, then, relative followed up and perfected by other economists. Adam Smith known as the father of economics believed that a country will specialize in the production of a product only if she has an absolute merit in the production of that product and based on this theory, countries will have trades with one another. If a country compared to other countries has the absolute superiority in the production of all kinds of goods, will there be trades taking place between countries? This is a question for which Adam smith's absolute merit theory did not have an answer for (Fotoohi, 2007).

David Ricardo believed that even when a country has absolute merit in the production of all goods compared to other countries, there is still a possibility that she will benefit from international trade. Hecksher- Ohlin criticized Ricardo's Theory and stated that every country exports goods whose production factors are plenty and using them leads to producing goods cheaply and the same countries import those goods whose production factors are plenty and using them leads to producing goods cheaply and the and using them will be costly (Fotoohi, 2007). There are plenty of theories about relative merit offered by economists, but from the application point of view and based on statically and experimental information, they are not easily measurable as far as relative merit is concerned (Fotoohi, 2007) for this purpose, different methods have been offered and used by researchers of economics which will be discussed.

Cost of Domestic Resources: this index measures the ratio of domestic resources compared to the shadow prices with the difference in incomes and the cost of tradable goods based on the shadow prices. DRC scale is attained this way:

$$DRC = \frac{\Sigma bokp^sk}{p^so - \Sigma aojp^sj} \qquad (1)$$

P^so: The shadow price of output; p_js the shadow price of tradable input j; ps_k the shadow price of untradeable input k' aoj the necessary amount of jm input for the production of one output unit; bok the necessary amount of km input for the production of on output unit o.

If DRC is <1, the net gained money will be higher then the shadow cost of domestic inputs, then production domestically will be cheaper that imports. In this case there will be money saving or the production of the product will have relative merit. If DRC is >1, the net gained foreign exchange will be less than the shadow cost of domestic inputs of producing that product. And in this case, that product will be more economical than producing it domestically. In this case, there is no foreign exchange saving or the production lack relative merit (Saee, 2001).

In the third situation, when the possibility of DRC with one, the situation is neutral and the net gained foreign exchange in this situation is equal to the shadow cost of domestic inputs and it depends on the policies of planners and politicians who will have to import goods to meet the domestic demands. It is even possible under the existence of long- term strategic exporting conditions, there will be recommendations for the production or export in order to have access to or maintain the market of the product at the international level (Saee, 2011).

2. Social net profitability: this index is the result of deducting shadow expenses of shadow income and it shows whether there is profitability or not. According to the equation if NSP=o, the production activity at

Research Article

each point is going to break even. If NSP is>o, the production activity has relative merit and if NSP is<o, the production activity will not have relative merit (Emad *et al.,* 2010).

$$NSPS_o = \left(P_o^s - \Sigma aojp_j^s - \Sigma bokpk^s \right) \qquad (2)$$

The Ratio of Cost to Social Benefits: This index is the result of dividing shadow costs over the shadow income. Activities whose SCB is between zero and one are profitable activities. That help the economic growth. SCB can not be less than Zero. The SCB can also be shown the following way (Saee, 2011).

$$SCB \ \Sigma \ bokp^s k + aoip \ j^s \qquad (3)$$

The costs of producing the goods based on the inputs that were used for the production can be divided into two groups:

Tradable inputs including chemical fertilizer, poison, seeds and untradeable inputs including work force, land, water and a Bart of machineries.

Chemical Fertilizer Cost: Chemical fertilizer is completely tradable. A portion of the country's consumed chemical fertilizer is provided by domestic resources. Another portion is imported whose cost insurance freight is the basis of shadow price (Emadzadeh *et al.,* 2010).

Shadow Price of Poison:
The most important poison used for agricultural products are weed killers, fungicide and pesticide. Their cost insurance freight has become the basis of shadow price (Emadzadeh *et al.,* 2010).

Seeds; Shadow Price: To attain this price, the average price per weight of a few major countries was considered (Emadzadeh *et al.,* 2010).

Land's Shadow Price: To calculate the land's shadow price, the mean of the land's rent rate as the shadow price with the application of 85% co efficiency was used.

Shadow Price of Water
Determination of water's shadow price is different in different places. In places where there is plenty of water and water irrigation for farm lands is from spring water, river, etc., the shadow price will be based on highest total cost of water which might include the cost of the right for water, its saving and transfer with a 45% efficiency of irrigation. Also, in some areas underground water is used. The highest final cost of water includes the cost of digging a well, production, transfer, saving, and irrigation with an efficiency of 45%. In the second method to determine the shadow price of the water, 85% of the cost of renting water in the area has been considered as the shadow expense. In the third method, to determine the shadow price of water, the final highest value of the water used in different products will be considered as the shadow price of water in that region. Also, we can also use mathematical planning method to find out the price of the input in different areas. However, these methods need data and to attain the production function of any of these products in the region (Mohammadi *et al.,* 2012). In this study, by using the second method and considering the studies conducted by the Ministry of the shadow price of water input became clear.

The Shadow Price of Work Force
As far wok force is concerned because of the lack of subsidy in the agricultural segment since it is not considered to be a skilled profession, the market is competitive, and the shadow price will be equal to the mean of the market price (to prevent all types of statistical errors) (Mohammadi *et al.,* 2012).

Shadow Price of Machinery Equipment
There are two types of shadow prices for farming machineries. The cost of machineries will be calculated in two ways; it means that 36% of the expenses will be the cost of equipment considered as untradeable input and 64% as tradable. There fore, in this research, also, this method is used.

Income Based on Shadow Price
To gain shadow income in one hectare, the dollar value of one kilogram of crops in the world market with the shadow rate of foreign exchange will be calculated. Then the performance of the crops per kilogram will be multiplied by rial price in order to get the shadow income for the crops in one hectare (Mohammadi *et al.,* 2012).

Research Article

The Shadow Price of Foreign Exchange:

The shadow price of foreign exchange, when it comes to the determination of rates supported by the government is important in the calculation of relative merit. In fact, this rate is the basis of reaching the acceptable shadow price for tradable products and inputs. To determine the rate of shadow foreign exchanges, the method of absolute purchasing power will be used.

$$\text{Rate of shadow foreign exchange} = \frac{P_{IG}}{PDG} \qquad (4)$$

PIG: The price of one ounce gold in the domestic market (in Rial)

PDG: the Price of one ounce gold in the international market (in dollar)

To determine the relative merit of canola using the three mentioned indexes, we should calculate the cost of production and the income of each product. In should be reminded that the data and information needed for this study have been received from Iran's Statistical Center and the Agricultural Crusade organization in Khuzestan province.

RESULTS AND DISCUSSION

Results

Considering the formula mentioned in the method of research, the shadow rate of foreign exchange based on the method of equal purchasing power will be calculated as:

Shadow Rate of Foreign Exchange= 41032641/138105=297.111

Inputs that are tradable and will be used in the production of crops are all types of chemical fertilizers, and all kinds of poison and seeds.

Chart 1: The shadow price of Tradable Inputs

Input	Shadow price (in Rial)
Phosphate	1146, 6
Potassium	11910., 302
Urea	12474, 63
Weed killer	329389,64
Insecticide	367110,54
Seeds	12147,914
Machineries (Farming)	840960

Source: Findings of the Research

In chart (1) and (2), the shadow price of tradable and untradeable are shown and the method of calculating the shadow price of tradable inputs is shown in the section related to the method of research.

Chart 2: The shadow price of untradeable inputs

Untradeable inputs	Shadow price (in rial)
Land: 85% is the rent of the land (The cost of renting one hectare of land)	6.800.000
Water: 85% is for irrigation (The cost of irrigation per hectare)	1.275.000
Work force: Average cost of wages per worker in one hectare	250.000
Machineries: 36% for using machineries (Total number of hours spent for using machineries in one hectare)	473040

Source: Findings of the Research

Research Article

The results of calculating the relative merit in three methods shown in chart 3:

Chart 3: Relative Merit of Hydro canola

Index	2012-2013
DRC	0.38
NSP	1395337
SCB	0.67

The price index for domestic resources has been calculated as 38% and its being smaller than one indicates that the relative merit of the product is high. In other words for each 100 Rials in savings as a result of not importing hydro canola, 38 Rials have been paid for expenses. The index for social net profitability was 13935337 and its being positive indicates the existence of relative merit in the production of the crops. The index of the ratio of cost to the social benefit was 67% and this shows the existence of relative merit in the production of crops. The top- mentioned results are in harmony with Malakdar *et al.,* about hydro canola in Mazandaran province for the agricultural years of (2004-2005), but they are in contradiction with Emadzadeh *et al.,* Studies about hydro canola in Chahar Mahal Bakhtiyari.

Conclusion Recommendation:
In the current study, we analyzed the relative merit of producing hydro canola in Khuzestan province in the agricultural year of 2012-2013. In the first stage, the shadow price of inputs used in the production of the crop in mind and also the shadow price of the crop were calculated. Based on the results of relative merit, hydro canola has relative merit, and it is recommended that since the province has the relative dependable ability for the production of this crop with a lower cost compared to the international prices, the replacement of imports in the long run, requires planning in the world market. Therefore, planning for the best exploitation of this merit and improvement of the current situation is important and by conducting regional planning and compiling a national and international marketing system, this goal can be achieved.

REFERENCES
Bruno M (1963). Domestic Resource cost and effective Protection: Clarification and Synthesis. *Journal of Political Economy* **80** 33-16.
Emadzadeh M and Sayadi HR (2010). Canola relative advantage in Chaharmahal bakhtyari province. *Science and Development Journal* **32** 128 - 146.
Fotoohi H (2007). Determine tea relative advantage in Gilan province. *Research and Economic Policy Journal* **44** 101-120.
Fung G (2004). The average and marginal Domestic Resource cost of foreign exchange. *Oxford Economic Papers* **47** 675-663.
Funing ZXZ and Lonbo F (2001). An approach to Alternative Measure comparative Advantage in Chinas Grain Sector. *45th Annual conference of Agricultural and resource Economics. January 22-25, 2001, South Australia.*
Gonzales A, Hasyno F and Perez ND (1993). Economic incentive and comparative advantage in Indonesian food crop production, Research Report. International Food and policy Research Institute, Washington Dc.
Haitham A (2007). Syrian Olive oil comparative Advantage Paper Prepared for presentation at the 1 Mediterranean Conference of agro-food social Scientists. *103 rd EAAE Seminar, Adding value to the Argo-food Supply Chain in the Future Euromediterranean Space. Barcelona, Spain.*
Malekdar M (2005). Economical survey of Canola production in Mazandaran province. MSc thesis, Zabol University.
Marrewijk CV and Hinloopeen J (2005). Empirical Relevance of the Hillman condition for Revealed Comparative Advantage: 10 stylized Facts Working paper Department of economic University of Amsterdam and Tinbergen Institute.

Research Article

Master WA and Winter Nelson A (1995). Measuring te comparative advantage of agricultural activities: Domestic Resource cost and social cost benefit ratio. *American Journal of Agricultural Economics* **77** 250- 243.

Mohammadi H, Kykhah A, Dehbashi V and Khalkobi A (2012). sugar beet production relative advantage. *Journal of Sugar Beet* 181-93.

Najafi B and Mirzaee A (2003). Agriculture relative crop advantage in Fars province. *Commercial Research Journal* **26** 35-50.

Navarro A, Losada F, Ruzo E and Diez J (2010). Implications of perceived competitive advantage, adaptation of marketing tactics and export commitment on export performance. *Journal of World Business* **45** 49-58.

Nicolini M (2011). On the evolution of institutional comparative. *Structural Change and Economic Dynamics* **22** 162-172.

Saee M (2001). Survey of orange relative advantage in Jeroft and Iran export. *Commercial Research Journal* 5126-39

Salami H and Pishbahar E (2001). Relative advantage change in Iran. *Economic and Development Journal* **34** 67-99.

Shafiee L and Yazdani S (2010). Cereal relative advantage in Kerman province. *Economic and Development Journal* **4** 440-447.

Utkulu Utku and Dilek Seymen (2004). Revealed comparative Advantage and competitiveness: Evidence for Turkey vis-à-vis the Eu/15 To be presented at the European trade study Group. *6th Annual Conference, ETSG2004, Nottingham, September 2004.*