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Economic evaluation (quantitative) for Mung bean (*Vigna radiata*) production in the Kamin Region, Sadat Shahr, Fars province

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ABSTRACT

Although one of the biggest disadvantages of an economic evaluation, is volatility of price and instability of economic conditions, But for land use planning, economic considerations play a key role in land use and making decision. Cost is an important factor that encourage farmers to grow special crop. Thus, in addition to the qualitative and quantitative evaluation, Land Suitability can be based on net or gross profit per unit area of land to be assessed in economic terms. The economic evaluation is based on net income or gross income from the land. The purpose of this study was to assess the economic evaluation for part of Saadat Shahr (Kamin region) for Mung bean (Vigna radiata). 8 drilled profiles in order to see the profiles were chosen and after collecting data on real output, the variable cost of producing the product and the critical values and estimated gross profit are calculated and land suitability classes were determined. The results showed that one unit has a moderate suitability (S_2) and two units have suitable classes (S_1) from separate units.

Keywords: Mung bean (*Vigna radiata*), Kamin region, Land Suitability, Economic evaluation, Fars province

INTRODUCTION

In quantitative evaluation, economic analysis plays major roles in land suitability classification. Boundary between N_1 and S_3 classes specified in the quantitative assessment based on economic analysis. Because at this point, product growth or physical characteristics of the land are rarely change suddenly and mostly economic condition, controls appropriate or inappropriate land use [1]. One of the criteria for quantitative land classification in some areas is critical production. Critical production is obtained from the results of the economic analysis and the determination of total variable costs and the price of an output unit [2]. In Economic suitability evaluation, Economic criteria is the most important and most fundamental factor in land suitability. The effect of the physical qualities of the land with regard to the price of inputs and outputs, come in the form of monetary measures [3]

Economic evaluation techniques in a closed area with different investment methods conditions, are applicable. It also has a wide range of accuracy. Mehnatkesh described classes qualitative, quantitative and economic land suitability for major crops of Shahrekord included Wheat, Alfalfa, Potatoes and Sugar beet the irrigated and concluded that the cultivation of potatoes in all units studied are more profitable than Wheat and Alfalfa [4]. Jalalian et al [5] during studies in Mehran Plain, Illam province evaluated the qualitative and quantitative and economic land suitability for Wheat, Corn and Sesame expressed quality evaluations. Result showed that most units are classified moderately suitable land for products and limitation of the physical properties of the Soil. Qualitative and Quantitative comparison of classes of wheat and maize showed that quantitative classes are a grade equal to or higher than the quality of classes which gives products from high level of management. While, quantitative classes, of sesame are lower than qualitative classes due to poor management in the cultivation of this product. The economic suitability of the results showed that profitable crop has been Wheat and crop rotation of Wheat and Sesame in cultivated units is more profitable than rotation with Wheat and Corn [5] Johnson et al [6] studied ALES computer model based on the FAO framework for quantitative and economic land suitability [6] Some people accurately apply more general considerations. In condition of project evaluation, if initial investment for land development is not done, gross profit is best known technique for economic Evaluation of Lands [7] Van Ranst et al [8] determined the quantitative impact of land qualities on rubber production grown on a wide range of soils under different climate conditions in Thailand. They used fuzzy set theory to evaluate land qualities in a land suitability

index which was used to predict relative Yield by means of multiple regression on various land qualities. Braimoh et al [9] applied fuzzy set and interpolation techniques for land suitability evaluation for maize. Land suitability indices were computed at points and then spatially interpolated. It was found that the interpolated land suitability was closely related to maize yield at the village level. In order to manage land resources properly, land suitability assessment is often conducted to determine which type of land use is most appropriate for a particular location [10]. Land suitability analysis is a method of land evaluation, which allows identifying the main limiting factors of a particular crop production [11]. At the same time it enables decision makers to develop a crop management system for increasing land productivity [12]

Van Walsum et al [13] developed a bio economic model for spatial planning of integrated land and water management and demonstrate the potential of the model for revealing and quantifying conflicts and interaction between regional objectives.

The mung bean (Vigna radiata), alternatively known as the moong bean, green grams a plant species in the legume family. The mung bean is mainly cultivated in India, China and Southeast Asia. It is used as an ingredient in both savory and sweet dishes. Mung bean are germinated by leaving them in water for four hours of daytime light and spending the rest of the day in the dark. Mung bean sprouts can be grown under artificial light for four hours over the period of a week. They are usually simply called "bean sprouts". However, when bean sprouts are called for in recipes, it generally refers to mung bean or soybean sprouts. Mung bean sprouts are stir-fried as a Chinese vegetable accompaniment to a meal, usually with garlic, ginger, spring onions, or pieces of salted dried fish to add flavour. Uncooked bean sprouts are used in filling for Vietnamese spring rolls, as well as a garnish for phở. They are a major ingredient in a variety of Malaysian and Peranakan cuisine, including char kway teow, hokkien mee, mee rebus, and pasembor. In Korea, slightly cooked mung bean sprouts, called sukjunamul , are often served as a side dish. They are blanched (placed into boiling water for less than a minute), immediately cooled in cold water, and mixed with sesame oil, garlic, salt, and often other ingredients. In the Philippines, mung bean sprouts are made into lumpia rolls called lumpiang togue. In Indonesia the food are often used as fillings like Tahu Isi (stuffed tofu) and complimentary ingredient in many cookings such as rawon and soto.

The mung bean was domesticated in Persia (Iran), where its progenitor (Vigna radiata subspecies sublobata) occurs wild [14]. Archaeology has turned up carbonized mung beans on many sites in India [15].

Areas with early finds include the eastern zone of the Harappan civilization in Punjab and Haryana, where finds date back about 4500 years, and South India in the modern state of Karnataka where finds date back more than 4000 years. Some scholars therefore infer two separate domestications in the northwest and south of India. In South India there is evidence for evolution of larger-seeded mung beans 3500 to 3000 years ago. By about 3500 years ago mung beans were widely cultivated throughout India. Cultivated mung beans later spread from India to China and Southeast Asia. Archaeobotanical research at the site of Khao Sam Kaeo in southern Thailand indicates that mung beans had arrived in Thailand by at least 2200 years ago [16] (Finds on Pemba Island indicate that during the era of Swahili trade, in the 9th or 10th century, mung beans also came to be cultivated in Africa [17].

MATERIALS AND METHODS

This study has been done for Kamin region, Fars province, Iran. About Kamin rehion, Sadat shahr we can say The region of Saadat Shahr with the area of approximately 14260 hectares is limited to About 80 km northeast of Shiraz between 52 degrees and 51 minutes to 53 degrees 13 minutes east longitude and 30 degrees north latitude 30 degrees 9 minutes north of the mountain gorge in the mountains and forests of East arsanjan of south to the mountains of West Mount Sivand. The average height plain from sea level is 1770 meters.

8 control profiles were chosen between dug-out profiles. The study area is shown in Figure 1.

The first, observation production (actual production in tons per hectare), which actually represents the performance of the product in different areas of the region was determined through consultation with farmers. The economic studies to determine the variable cost of Mung bean (*Vigna radiata*) production in the region was done. To set the Mung bean (*Vigna radiata*), variable costs questionnaire was prepared. It includes information such as the cost of plowing, disc, spraying, fertilizer and land preparation which after consulting with local farmers for Mung bean (*Vigna radiata*) was completed.

Some suitability classes are determined by the amount of gross profit. It was determined the maximum gross area for each type of efficiency and Based on the maximum and amount of help given in Table 1, the band of suitability classes of economically was determined.

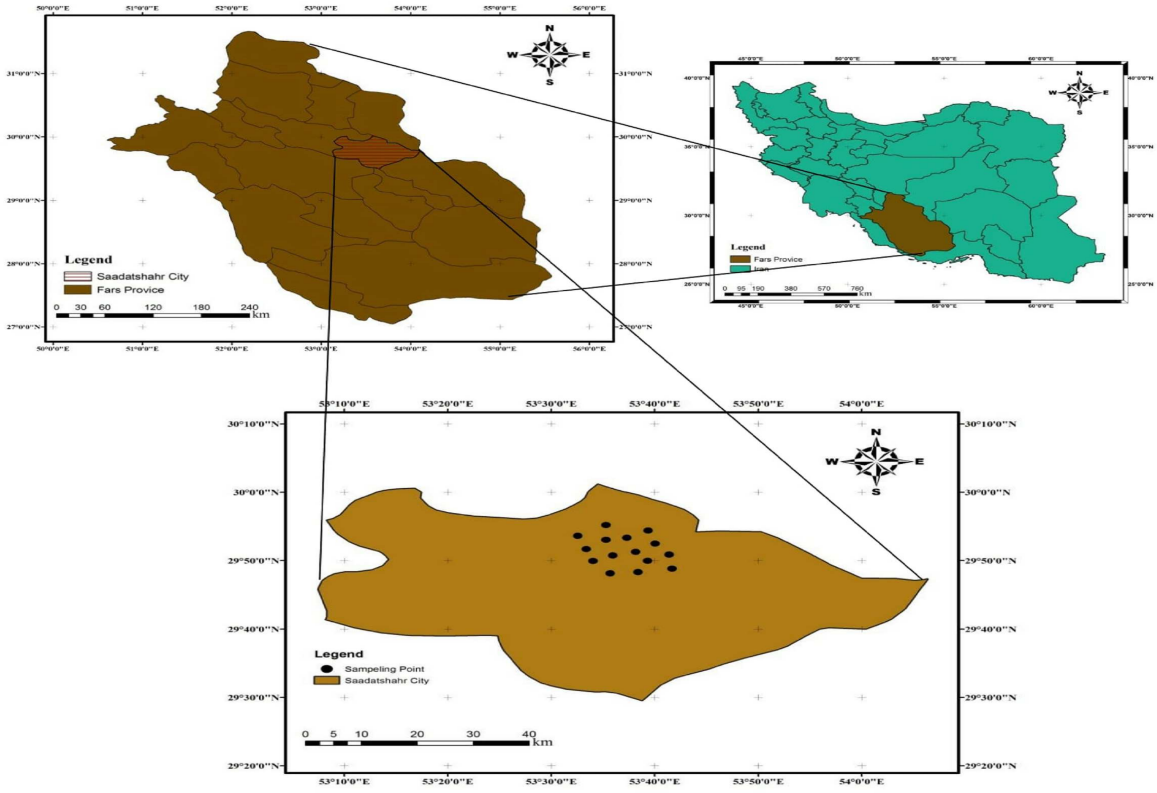

Figure1- Geographical Location of the Study Area

Table 1. Land index values for land suitability classes [18]

Suitability class	Land index
Very Suitable(S_1)	Lands harvesting index>75
Moderate Suitable(S_2)	Lands harvesting index 50-75
Marginal Suitable(S_3)	Lands harvesting index 25-50
Inappropriate in the current situation(N_1)	Lands harvesting index 12.5-25
Permanent Inappropriate(N_2)	Lands harvesting index<12.5

Equation 1- Gross income: The amount production × Price per unit of production
Equation 2- Gross profit: Gross income × Total variable costs

Bound of land suitability classes were determined based on gross profit (Table2).

The results of the economic assessment study area (Table 2) showed that the suitability of land 1.1 and 3.1 units are S1 and the suitability of land with 2.1 is S_2.

RESULTS AND CONCLUSION

Table2. Boundary of financial suitability classes for Mung bean (*Vigna radiata*) in the study area

Gross profit (RLS /ha)				Kind of product
N	S_3	S_2	S_1	
<0	0 -18000000	18000000-31500000	>31500000	**Mung bean (*Vigna radiata*)**

Table 3. Gross profit (RLS per hectare) and economic suitability of different land classes

suitability Classes	Gross profit(RLS /ha)	Land Unit
S_1	34250000	1.1
S_2	22450000	1.2
S_1	32280000	1.3

Generally Mung bean (*Vigna radiata*) in today's world and especially in Iran country has found a special and Invaluable place. And since the Fars Province is one of the most important province for cultivation of Mung bean (*Vigna radiata*) in the country. We should be able to obtain Extensive and detailed study to make valuable effort by Existing methods such as crop breeding to increase the quality and quantity of the product. Always remember that this must be the least damage to the environment and to maximize the use of sustainable agriculture. Management, land quality, on time spraying and above all, varieties can better control Mung bean (*Vigna radiata*) yield in the region. Givi with studies of land suitability evaluation in Falavarjan area, worked on economic suitability of the land for planting crops in the area. Gross profit criterion in this study were evaluated. The results showed that Management level and especially the area of land plots has Effective role in terms of profitability and the economic suitability the lands of the region. He also showed that the higher management level, the more economic profitability of land [19].

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