Optimizing Patterns for Cultivating Agricultural Products toward Sustainable Development (Case Study: Sahl-Abad Plain)

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Extended Abstract

1. INTRODUCTION

Studying the reasons that pave the way for development in advanced countries shows that the origin of development in most of these countries is their overproduction in agriculture section and its dynamic in the first stage of development that is a basis for developments. In other words, agriculture has a fundamental role in development of countries. So, for comprehensive and sustainable development, least developed countries (LDCs) need to organize their agriculture section and follow sustainable development in agriculture. However, for most of people living in these villages in this plain, farming is an economic activity, so restrictions for access to water resources in agricultural section and other types of consumptions are the most challenges for sustainable development and especially in agriculture section. By using goal programming, in this study we tried to present an optimized pattern for cultivation in Sahl-Abad plain, emphasizing on economic productivity and efficiency in water consumption to help sustainable development in agriculture of this region.

2. THEORETICAL FRAMEWORK

Sustainable development is the result of maximizing the productivity of agricultural section's capacities (such as human and natural) and minimizing destructive consequences in environment. Because of deep connection between agricultural section and environmental capabilities, reaching to this important matter needs implementation of policies and programs that are suitable for (human and natural) environment and acceptable by farmer's societies. Preparing and compiling a suitable pattern for cultivation in different regions, is one of the applied policies for improving economic role in agriculture section and decreasing its ecological pressures toward sustainable development. In this modern world, needs have changed and meeting these needs would require enough incomes for farmers. Accordingly, there is a necessity to form production systems and new patterns for cultivation to meet these needs and improve the level of income which is the result of working in agricultural section. In economic literature, new patterns for cultivation are known as "Optimized Patterns for Cultivation" and by applying them, many of problems related to agricultural, farming productions have been eliminated and productivity of production agents have been maximized.

3. METHODOLOGY

This study is a practical research. Data were collected by documentary research and fieldwork. In fieldwork method, we used instruments such as questionnaires prepared by the researcher, interview with important knowledgeable people and observation. Studied sample size includes all the inhabited villages in Sahl-Abad plain in Nehbandan (92 villages). According to the nationwide census of 2006, a total of 1565 households were living in the villages of this plain. Among these villages in Sahl-Abad plain, villages with more than 20 households were selected as sample villages which were 28 villages. The number of households was determined by Cochran's Sample Size Formula in which they were selected and questioned randomly.

4. DISCUSSION

To logically organize the pattern of cultivation in Sahl-Abad plain, by cluster analysis the studied producers were classified into three groups The first group has the most frequency of producers, 195 people and the average size of farm for these producers has been estimated 4.2 hectare The
second group includes 41 producers and the average size of farm for them has been estimated 19.2 hectare. The third group or great producers includes 14 producers and the average size of farm has been 56.6 hectare.

Analysis of current pattern shows that agricultural products such as wheat, malt, alfalfa, maize (corn or forage corn) are cultivated by all three groups. In first group all the agricultural products are cultivated. In second group, just millet cultivation is not included. Combination of cultivating in third group includes cultivating products such as wheat, malt, alfalfa, maize (corn and forage corn) and millet.

Result showed that current cultivation in Sahl-Abad plain and also disordered pattern of goal programming in studied producer's groups were different. Therefore, in small producers' groups, if the producer wants to act in economic structure of goal programming (with maximum efficiency and minimum water consumption) according to determined goals, the pattern should be organized in cultivating products such as alfalfa, cotton, maize (corn and forage corn) which are affordable. But if producer wants to achieve environmental goals (minimizing consumption of chemical fertilizers, minimizing consumption of chemical pesticides and minimizing the usage of machineries), the current pattern should be eliminated and products such as wheat, forage corn and cotton should be replaced.

The average producers (second group) in the studied region should eliminate products such as malt, cotton, corn and instead they should increase the size of farming products such as wheat, alfalfa and forage corn. To achieve the aims of environmental structure, these producers should apply optimized pattern for cultivation of wheat and forage corn and they should increase the size of farming these two products. Instead, to organize the pattern for cultivation, they should eliminate products such as malt, cotton and corn from cultivation circle because they are not affordable environmentally.

The third group, in other words great producers, should increase the size of farming alfalfa and wheat to achieve their economic structure aims. Size of farming millet should decrease and cultivating products such as malt and maize (corn and forage corn) should be eliminated completely. To achieve the aims of environmental structure, the combination of pattern should include cultivating products such as millet, wheat and malt, and more than decreasing the farm size for producing alfalfa, cultivating maize (corn or forage corn) should be eliminated from pattern of cultivation. According to total of these three groups it can be understood that millet product is not affordable in Sahl-Abad plain.

5. CONCLUSION

The results show that millet product in current pattern is not economically or environmentally affordable. Economic goals in this context have priority to environmental goals too. The optimized pattern which is presented in both structures of goal programming and also in all groups leads to decrease in consumption of measures of production limiting agents.

Keywords: Sustainable agricultural development, optimized pattern for cultivation, goal programming, Sahl-Abad plain

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