

Introduce Appropriate Rotation Taking into Account the Living Conditions and the Level of Farmers Finance using Hierarchical Analysis Process (AHP)

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Research Article

Abstract

Part of the activities that are designed cropping pattern in order to maintain stability, or at least pushing the system towards sustainability is considered. In achieving this objective, reasonable design, optimize the use of inputs and more judicious use of the resources involved. In the design of pattern Have the potential to produce and adapt it to the culture and indigenous knowledge, public policy and market issues will also be evaluated. In order to enhance the credibility of design patterns and these patterns are highly accepted by farmers, addressing the fundamental issues of life of farmers and farmer empowerment is very important. The exact set of design patterns and determine the correct frequency, is the next important steps. Measures should be taken into consideration is totally derived from regional and local issues and customs and living conditions of farmers should be considered. In this paper, cropping patterns through eight criteria that basic standards of living conditions of farmers each have their own separate sub-criteria, using Analytical Hierarchy Process (AHP) is designed.

Keywords: AHP; Agricultural finance; State land area; Market, Indigenous knowledge.

1. Introduction

Zaghe city as one of the main poles is agricultural and irrigated crops in the Loris tan state of Iran. Agriculture dominates the economy of the city and other economic activities in this area have a lesser role. Thus, according to this production in the agricultural sector is one of the main variables of economic development Zaghe. To advance closer to the sustainability of the most basic pieces that the farmers should start this chain. In this approach, taking into account the welfare and empowerment of farmers is very important and is considered important. The attitude to design a suitable model taking into account the financial situation of agricultural land under a measure could arguably the design helps

to be closer to the lives of farmers. In consideration of such cases, even lead to greater acceptance by the agricultural model and provide farmers even saw them.

Analysis of hierarchical process (AHP) is one of the tools for achieving this target. Method (AHP) is a flexible, robust and simple to decide if the criteria are conflicting decisions and make difficult choices between options, the choice is placed [1].

The aim of the present study using the Analytic Hierarchy Process (AHP) to evaluate eight criteria and sub-criteria analysis and pattern selection based on the living conditions of farmers and the situation in the region in terms of both indigenous knowledge and culture of acceptance and the market.

2. Materials and Methods

2.1 Area of study

Zaghe city in Khorramabad, capital of Lore Stan province located 40 km north of the city. This area is located in the country's north-south transit route and strong agricultural activity. The study area is higher than 1845 meters above sea level and the annual precipitation is 550 mm this city. In terms of geographic coordinates, area 70/48 degrees east longitude in degrees north latitude and 50/33 located.

2.2 Case-study approach

AHP is a mathematical synthesis and an algebraic method of deciding the relative scale. This method uses a network system and the use of multiple criteria or determined to rank the importance of various options used to be a complex decision making process [2]. This way of organizing information and apply their judgment and make decisions based on ability, Emotions and logic to offers and the judgments are combined in the form of results that is consistent with internal expectations. The above process to solve complex problems by a hierarchy of criteria and results are judged by extraction helps to advance priority [3].

2.3 Hierarchical tree

Target: The main research question or problem you intend to solve it is said that the goal in this study is the goal: Introduce the best rotation to farmers according to the requirements and criteria in order of preference. Due to the ability of farmers a rotation for each class of them to be introduced. Farmers as decision-makers, different classes make up this assessment. All the information can be obtained through questionnaires filled by the farmers.

Criteria: To ensure standards are said to be objective and constructive criteria. In fact, criteria by which they are measured.

The eight criteria for this study include:

1. Cost
2. Profit
3. Reliance on indigenous knowledge
4. Mechanization
5. Marketplace
6. Financial level of farmer
7. Farmer ownership
8. Terms of farmland

Sub criteria: In order to evaluate criteria and finer details of each measure can be used to process the hierarchy below the set standard. In the present study criteria 6, 7 and 8 for better understanding and more accurate analysis each pack as their own sub criteria.

The level of agricultural finance: is composed of the three sub criteria:

A: Weak financial level

B: The average funding level

C: Strong financial level

Farmer ownership: is composed of two sub-criteria.

A: Leased

B: Owner

Terms of farm land: it is composed of the three sub criteria.

A: Poor conditions

B: The average condition

C: Good condition

Alternative: Alternatives are in order and to target the hierarchical tree And answers among the alternatives outlined goal is achieved. In the present study alternatives set up six rotation.

Pattern A: Alfalfa, potatoes, wheat, canola

Pattern B: Wheat, legumes, beans, wheat

Pattern C: Alfalfa, alfalfa, potatoes, alfalfa

Pattern D: Wheat, beans, potatoes

Pattern E: Wheat, potato, canola

Pattern F: Wheat, alfalfa, potatoes

Above rotation, those that are implemented in the region. The aim of this study, introducing the most appropriate rotation according to different classes of farmers.

The first target level and the next level criteria and sub criteria make up and eventually replace the last level of the hierarchical tree shape.

2.4 The software of AHP

After data collection software to use Expert choice that the application for review and the analysis is based on a hierarchical approach. The necessary information to compare a couple of different criteria to target it will be given to researchers.

3. Results

Studies in many different questionnaires after analyzing different alternatives were seen from an agricultural perspective. Each strengths and weaknesses of alternative agriculture have different views locals showed. According to research data indicated that the implementation of a general pattern in an area just is not right and regardless of the conditions of farmers cannot be expected to a certain pattern or patterns that they are not involved in determining the farmer is fully implemented. However, such a model could be successful in not running.

To determine the correct pattern and rotations in addition to scientific issues and public policy be sure to view their lives as farmers and giving importance to the development of important points, is the smallest member of the series. The financial condition, assets and requirements for agricultural land But the most important element of the reception could be a pattern that selects the farmers', It must therefore be considered in determining crop. To achieve a sustainable pattern of fatigue and approaching the pillars of sustainable development according to the welfare of farmers and farming families is essential.

In the first AHP pairwise comparison of each alternative criteria that are relevant to the charts below and the following Comparisons. Chart prioritize the alternative is clear and understandable (Figures 1-4).

Due to the iconic graph pattern C of income and profits and in terms of domestic adoption Weight gain is high, But it should not be hidden from view



Figure 1. Comparison chart pair alternative measure of cost.

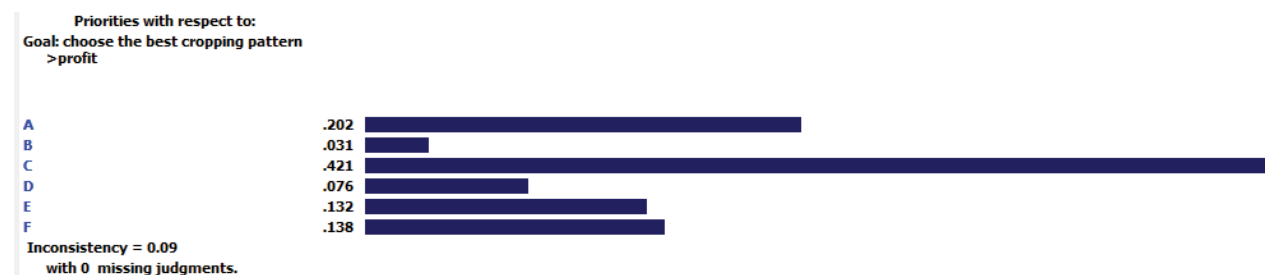


Figure 2. Comparison chart pair alternative measure of profit.

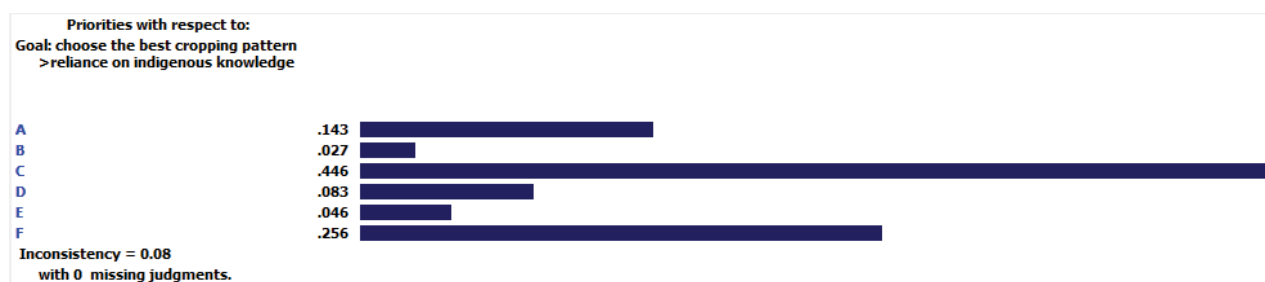


Figure 3. Comparison chart couple options on the measure to reliance on indigenous knowledge.



Figure 4. Comparison chart couple options in the criteria of mechanization.

that mechanization and also has a high cost and If a farmer can earn at this level have the ability to afford the costs involved [4-9].

3.1 Market situation

The market and sell products, Access to market is very important for farmers. So farmers typically prefer rotation such that it is easy for sales and marketing. Access to markets and reduce transport costs and marketable each crop to settle into rotation and cropping pattern is very important. After considering the above-mentioned, Best to accommodate the plants in the rotation is that can supply products to the market in terms of market and farmers are more comfortable.

As Figure 5 shows the results of the evaluation, In terms of market pattern A and pattern E have a weight and other pattern of the mentioned pattern is better than two. So, it can be considered an outline of the measurement market benchmark test the two patterns mentioned how much they are capable of accepting the views of farmers.

In the next three criteria, each of which is composed of the sub criteria, In case any criteria tables of the agricultural population and agricultural land as well as percentages and are available as follows in Table 2.

Based on the above assumptions that 30% of the farmers in the area are financially weak, 45% of average wealth and the rest of Finance had acceptable levels (Table 3).



Figure 5: Comparison chart alternative in the criteria of market.

A	B	C	D	E	F
	5.0	5.0	5.0	1.0	5.0
		1.0	1.0	5.0	1.0
			1.0	5.0	1.0
				5.0	1.0
					5.0
Incon: 0.00					

Table 1. Comparison of alternative in the criteria of market.

	a	b	c
a		4.0	2.0
b			3.0
c			
Incon: 0.10			

Table 2. Shows the agricultural population in terms of criteria of financial.

	1st (L: 1.00) owner
1st (L: 1.00) leased	7.0
owner	Incon: 0.00

Table 3. Agricultural population status of farmer ownership criteria.

	a1	b1	c1
a1		5.0	1.0
b1			5.0
c1			
Incon: 0.00			

Table 4. Shows the situation of the agricultural population in terms of criteria of farmland.

Table 4 shows 20% of tenant farmers in the area were forced to rent land for agriculture and began farming on leased.

Due to the test data analysis, 25% of farmers with a difficult position in terms of agricultural land were minimal, some of them even crossing the road on his land and not and the use of the machine requires the permission of their own land downstream. These groups of farmers much about plants that require high mechanization in cropping pattern are vulnerable. Farmer ownership criteria (Figure 6).

Landless farmers whose land and are forced to rent land three primary pattern was not good and they reach the end goal were patterned after less time. Owner farmers, as well as the diagram above, the opposite are true.

In the case of these farmers who are forced to lease land understand that time is very important for farmers must be known. Farmers can decide on long-term patterns that are owner it took quite decisive for tenant farmers and should be considered in the selection pattern. Annual lease land to farmers who

choose alternatives that do not make sense and is not possible rotation.

Financial level of farmer criteria (Figure 7).

The standard of farmers in poor financial ideas clearly visible and distinguishable difference was. Farmers therefore welcomed the level of his wealth of options with less capital they have. Despite the more profit there was a choice of options, but all farmers taking into account the status of your assets to options that financially afford it. For medium and strong financial levels almost was the same situation and they also charts the following doses are (Figures 8 and 9):

Conditions farm land criteria (Figure 10).

Interestingly, in this part of the review of the farmers who own the land and the conditions were quite inappropriate, very carefully about choosing a pattern and all selected conditions based on the ability to perform mechanization and water supply and even travel with their machines. They believed that even having enough money should also consider land conditions and the conditions of their agricultural land



Figure 6: Comparison chart couple options on the sub criteria leased property.

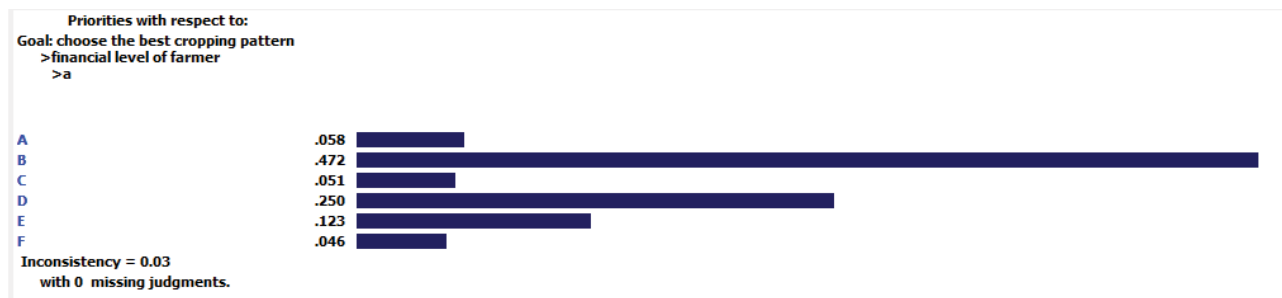


Figure 7: Comparison chart alternative under financially weak sub criteria.



Figure 8: Comparison chart alternative test measures average funding level.

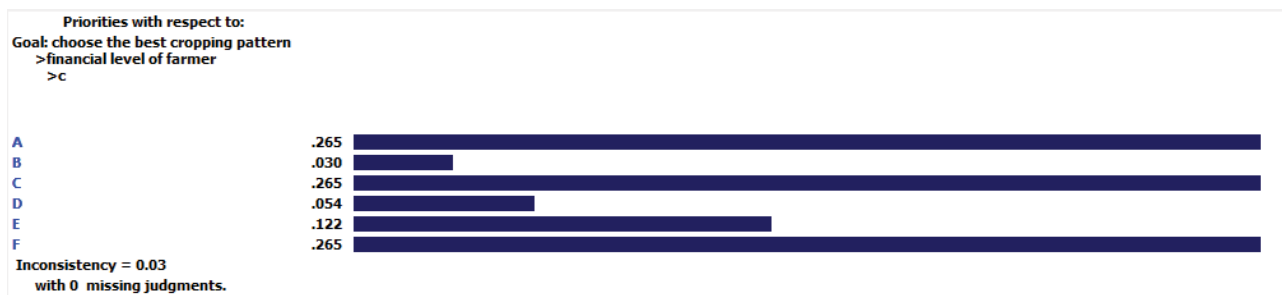


Figure 9: Comparison chart pair of strong financial alternative measure.



Figure 10: Comparison Chart paired alternative in poor conditions sub criteria.

that is the determining factor. Conditions in the graph below (Figures 11 and 12):

3.2 Binary comparison criteria on goal

Finally, after taking into consideration the criteria and sub-criteria paired comparisons, paired comparisons of criteria for the valuation of each criterion from an agricultural perspective on the goal of the research was conducted, that according to the relevant section in the questionnaire, respondents indicated they are absolutely prioritized and is evident in the following graph (Figure 13).

Interestingly, the majority of farmers in view of the financial level and the land conditions were crucial and a farmer plants and pattern of your choice entirely based on the selected conditions (Figure 14).

As Figure 14 shows weight gain in the breakeven point is also relevant to criteria that farmers set and farmers by taking this action to select conditions. We must see that design patterns are introduced to farmers and to what extent they are consistent with these conditions and pattern can be successful certainly that is better aligned with the perspective of a farmer.

4. Discussion

Due to the rotation and patterns of agricultural tax should be designed and be available to farmers the farmers' ability to apply their cost and implementation of rotation patterns correctly. Different rotations each had different characteristics. Some products are profitable even though according to the level of agricultural tax and the land that he may not be applicable. Pattern B with the lowest cost compared to other patterns is recommended for small farmers financially if the pattern C with high profitability for farmers with high financial strength is considered.

Taking into account the financial circumstances of each farmer how much power plants have suggested to him that all the conditions and assets he could both financially and in terms of plant needs is water and mechanization. Plant potatoes for the farmers whose land is not flat or that the initial costs do not have to buy seeds and mechanization although it is profitable and useful, but for this level of farmers is feasible, so this period for this category of farmers should be doomed to failure. This is in contrast to those of flat land and high financial strength marked. Plants those are less profitable for the farmers should be in rotation.



Figure 11: Comparison chart alternative sub-criteria test items the average condition

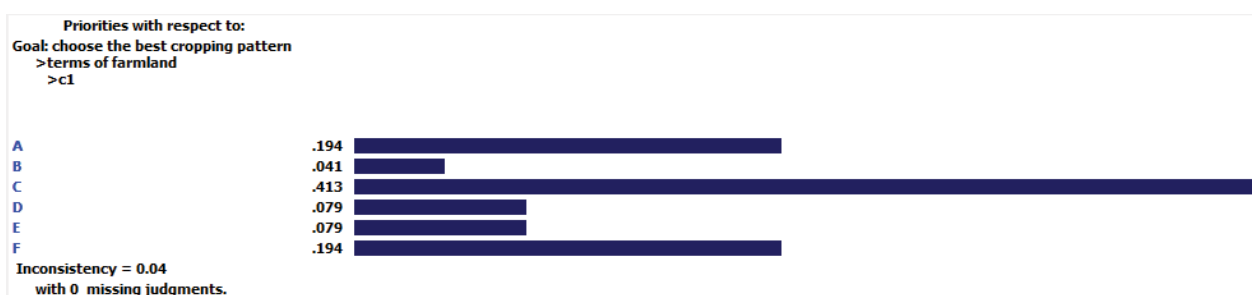


Figure 12: Comparison chart alternatives sub-criteria test items good condition.



Figure 13: Comparison chart couple criteria on goal.

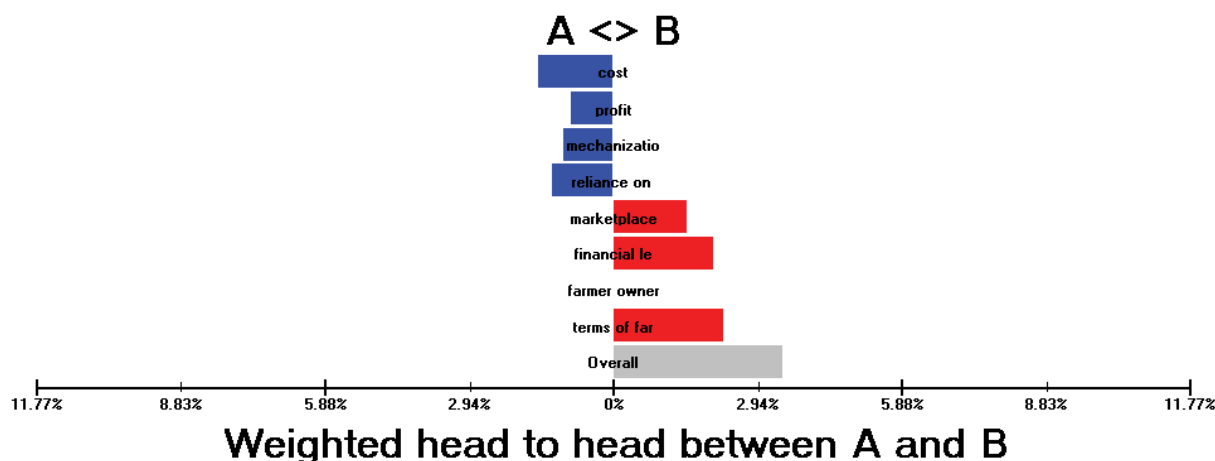


Figure 14: Weight gain graph head-to-head criteria.

The next important thing is agricultural property. Farmers who leased their land for a long rotation of time will not, if the owners can be long rotations on land use and prohibiting there is no time for this category of farmers. For Leased farmers patterns D, C and F is recommended that you have less time.

There mechanization of agricultural finance in the region and be prepared to equipment and costs in the design rotation is very important. The market and sell products, proximity and access to the market are absolutely crucial. Rotations offered to farmers for sales and marketing should create problems for them. Market access and reduce the cost of transport is very important for the farmer.

Combine of cereals with slight variations in the study area were used for canola so farmers as a bothersome issue for harvest it looked to, so the pattern of A and

E for farming mechanization criteria was unacceptable. One of the things that cause weight gain was lower than the market criteria patterns A and E in the presence of canola in the rotation. As a freshman canola plant due to lack of market access and the lack of indigenous knowledge in the area of the lower weight and farmers about crop rotation with canola were in their place were regarded with reluctance and patterns B, C, D and F are acceptable and acceptability to farmers have more flexibility.

In the circumstances of farmland, each farmer light of the situation on the land had decided patterns. There were farmers whose lands were mountainous and steep terrain to move machinery and mechanization was problematic. This category of farmers on potato and alfalfa despite high profits, no firm decision and best practices for this category of farmers pattern B is proposed that the commute is less machines.

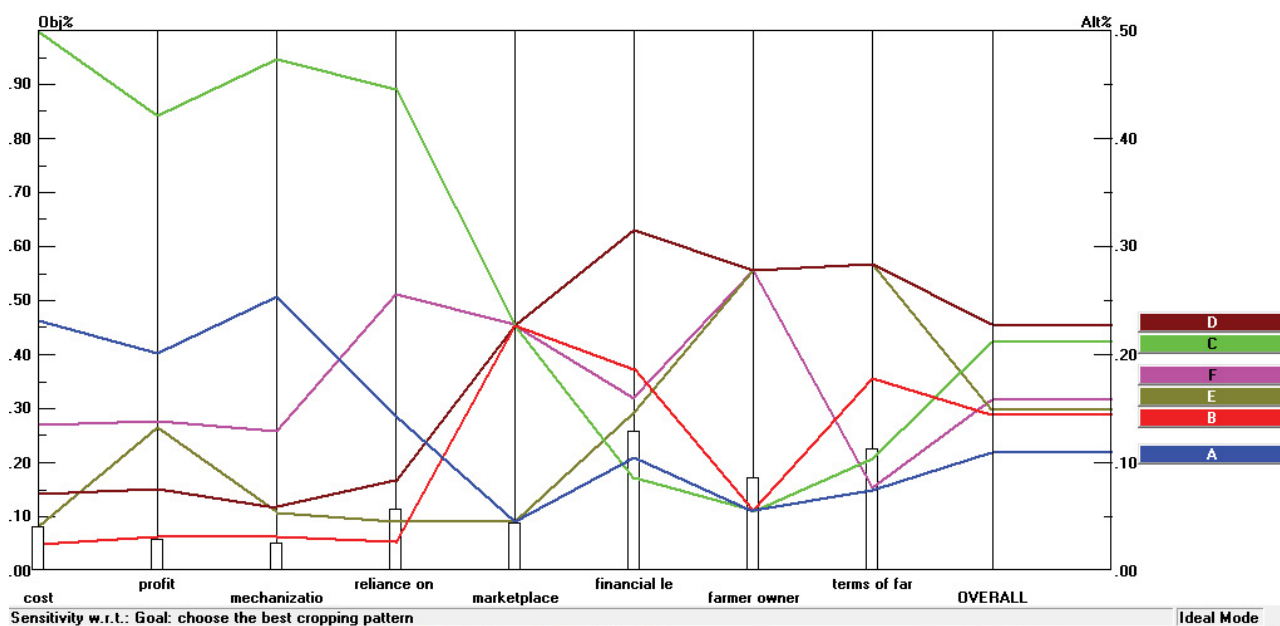


Figure 15: shows the outline of an alternative in criteria and criteria in goal.

Thus, taking into account the views of farmers can be different patterns for a region considered and provide a pattern for the region and it will be waiting for its successful implementation failure. So farmers do not trust the government organs but the numbers that really are not able to implement rotations considered are causing disturbances in the agricultural area. Such as the leasing of land to non-indigenous farmers and Water efficiency is much lower plants like watermelons that take place in the study area. Outline alternative in criteria and criteria in goal at visible and understandable is as follows (Figure 15).

Agriculture Organization can be used to enter the canola in the local that not unacceptable in the region, using specialized personnel at its disposal and land in their possession to the cultivation of canola and by importing equipment and mechanization in the area and boost the local market this product reliability to attract farmers and this plant with more confidence cropping pattern and rotation of the region.

5. Conclusion

As the first level of the great chain of agriculture world farmers venerable and any decision in this area must be done with consideration of the conditions of this class and sustainable development in agriculture without considering the welfare of farmers and farming families is not possible.

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