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Design of strategic model of agriculture products of Bijar County by hybrid SWOT-ANP model

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ABSTRACT

In this study, strategic model of agricultural products from a section of Bijar County by hybrid SWOT-ANP model has been studied. However, over past years, in spite of efforts for boosting the production, self-reliance, processing and exportation of agricultural products, this section has not still played its real role in the country economy. Managerial weakness in planning and supply chain of agricultural products and intervening of brokers and dealers in this area can be considered as an essential problem in this part of economy, and one should seek an appropriate solution for tackling it. In this paper, ANP method and Super-decision software are used for prioritizations. At the end, through interviewing with 7 experts, pairwise comparisons have been done for 7 clusters and geometrical average of values of comparisons were considered as final score of each one of comparisons. Results showed that making agricultural industry purposeful in fertile regions of the county has been placed at first priority, identifying strategic products and investing on them in second priority, and attracting collaboration of farmers to grow products resistant to water shortage conditions and operationalizing plans related to fostering underground water sources has been placed in third priority.

KEY WORDS: STRATEGIC MODEL, AGRICULTURAL PRODUCTS, HYBRID SWOT-ANP MODEL

INTRODUCTION

Agriculture development and in particular focus on stallholder farmers in rural regions definitely should be the greatest mission of academic and research centers in general, and agricultural faculties and promotion and study centers in particular. Current trend of universities and research centers, however, shows that gap between these sections with agricultural sector not only fails to be filled, but also one can see this gap is further enlarg-

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ing and this is the worst damage to agriculture. That is to say, although there has been an increase in population of graduates of agricultural study as well as in setting forth scientific papers and knowledge when compared to past years, and this trend was featured by steep acceleration, however, high rate on unemployment of agricultural context from one side, and inefficiency of agricultural operational section and drastically low productivity in this area from other side suggests the lack of firm relation and lack of overlapping and synergy between activities of scholar section with production section. Therefore, it is needed to establish a fundamental change in this area.

In this paper, we intend to examine this problem through a systematic and comprehensive attitude. Systematic attitude suggests that for agricultural development, improvement of farming products and selecting a suitable pattern for relation between various sections of system, firstly it is needed to be aware of status of organizations, opportunities and threats and their strengths and weaknesses and take into account many factors and criteria, therefore, presenting a pattern and strategy is a multi-criteria decision making which should evaluate many complicated factors (Zack, 1999). Strategic management includes decision taking and integrated activities for developing and implementing effective strategies, control and evaluating their outcomes. Strategic management represents a process through which organizations analyze their internal and external environment and understand it. In addition, they establish their strategic path; create some strategies which assist them in attaining to their objectives. They put these strategies into action; all of these measures are an effort for satisfying stakeholders (Erabi 1995).

Agriculture and production section serve as operational section in the forefront of management and knowledge transfer process. Success or failure of this section indicates the degree of efficiency and effectiveness of agricultural knowledge and technology system of a country. Considering the relevance of this section, the importance and history and role of agricultural development and its bearing on other social indexes are discussed in this paper separately. The origin and basics of economy globalization is definitely global trade, meanwhile trading various commercial products and reviewing the global transactions for farming crops is one of the major debates of international community, (Jalaei et al 2015).

According published statistic of UN, 62 % of world population is consisted of rural people and this proportion reaches to 76% in Asia and Africa. Furthermore, in 1972, roughly 700 million people in the world were victim of absolute poverty of which 85% lived in rural regions. In Iran also, near 29% of country population live in villages whose activity is mostly farming (FAO 1988). In this paper, through a full-fledged approached, firstly one reviews factors affecting the design of strategic model of agricultural products section. Then, strengths and weaknesses and threats in agricultural technological system are examined, and strategies of establishing efficient relation between these sections are discussed based on SWOT technic. Considering the studies of researcher, it has been specified that in all conducted study, there is no study conducted regarding design of strategic model for agricultural products section in Kurdistan province. Therefore, this paper, with an approach distinctive from other studies seeks to design a strategic model of agricultural products section in Bijar County.

PROBLEM STATEMENT

Agriculture is one of the most important influential sectors in economy of any country that plays a leading role in political and economic independence. Existence of abundant natural resources and special climate position changes Iran into a country with four seasons. However, over past years, in spite of efforts for boosting the producing, self-reliance, processing and exporting agricultural products, yet this sector fails to fulfill its role in country economy. Managerial weakness in planning and agricultural products supply chain and intervening of mediators and dealers in this field can be considered as main problems in this part of economy and for solving it one should seek an appropriate solution. Rural development strategies are based on seven determined objectives including: agricultural production growth, better use of rare resources, optimal use of capital, establishing professional opportunities, redistribution of income, enhancing life level and involvement of rural population in social affairs (Zamanipour, 2008).

Unfortunately, a lot of less developed countries fail to pay necessary and sufficient attention to agricultural section for attaining to rapid development and as much as possible they turn toward rapid industrialization. Requirement of industrialization of fundamental sections is justifiable in these countries; however, this point that essential industry can't be made and developed without basis is less addressed by these countries. In capitalistic developed countries shift from traditional economy to monetary economy was coupled with technical development and enhancement of productivity of agricultural sector. Thus, not only a part of agricultural workforce is released and directed toward industry part, but also agricultural surplus set the stage for industrialization. This change has not taken place in undeveloped countries; therefore, modern economy section has been incorporated in our country without relating to traditional economy section. It continued its activity without

having organic relation with activities of that section. In traditional section that is mostly agricultural, compaction of population and remoteness from success path caused reducing in productivity and by shrinking agriculture, a lot of workforce are pushed aside of the field and farming labor changed into latent unemployed with no purchase power. Competition of imported industrial products gradually pushed local craftsmen aside and hindered the formation of local industry.

Surplus of workers of agricultural section with no purchase power provided a great mass of cheap workforce and this itself paved the way for admittance of foreign capital in countries and their activity in sections which call for cheap labor, and most of these activities are in exporting section of raw material. Therefore, it seems to be rational that in such countries the development plans should be devised in such manner that development of agricultural section would be placed in priority with regard to other parts and further attention and emphasis should be paid to this area (Todaro, 1986).

Bearing in mind the problems of agricultural section, the sustainable development is a highly significant and essential discussion, because regional difference calls for desirable planning considering the existing potentials, and this calls for professional measurement and assessment. Each region has its own powers and scarcities when it comes to agriculture, thus identifying and analyzing them assist in sustainable development of agriculture so that available sources would be used in a desirable and suitable manner. Thus, using models related to identifying agricultural strengths in each region prevents the problems (Falsoleiman and Sadeqi 2013).

METHODOLOGY

This paper is practical in terms of objective and is done by descriptive and exploratory. In this study, the setting of study is agricultural entity (Jahad-e Keshavarzi) and Bijar county Payam-e Nur University. In this study, statistical population is consisted of all of professors and experts of university and stakeholders of this scientific field, staff of agricultural Jihad, agricultural Jihad promotion and development section experts, professors and students of Bijar country agricultural faculties N=80. Sampling method: in this study sampling method was not used and census was used instead. This study seeks to examine and identity the strategies for establishing the relation between agricultural products sector and designing a strategic model for this section. Study method is descriptive and has a survey. Step 1: The study examined the design of strategic model of agricultural products section in the country through a

systematic review. Step 2: In the second step, researcher fulfilled some guided interviews for competing information obtained from studying documents and literature review for detecting the factors affecting the establishing relation between designs of strategic model with agricultural products section. Step 3: In third step, the researcher tried to find through interviews the strengths and weaknesses and opportunities and threats based on influential factors. Step 4: in fourth step, researcher specified the ranking of factors by a questionnaire and uses Super-decision software and ANP method for determining the priorities. Geometrical averages of values of scales taken as final score of each one of scales. Strategies opportunity have been specified using obtained coefficient for each one of them. Step 5: In the last step, we have specified the main strategies through establishing SWOT matrix.

Data analysis: In this study considering the subject and studied variables, two types of information were used. Secondary data: thus, in this study secondary data were collected from various sources through library study. Primary data: in qualitative studies, interview was the best tool for collecting real primary data because in this study identifying opportunities and threats of establishing relation between design of strategic model and agricultural products sectors from one side, and identifying basic strategies for fostering this relation from other side was the matter of interest.

Interview with experts was used as main tool of collecting data. Interview in qualitative studies was done with certain order, firstly researcher posed the main questions of study and required information using directive methods were collected from each one of interviewees. Number of required interviews in this method depended on obtaining the repetition of answers by interviewee, that is, the independent interview was continued as long as answers of interviewees were almost identical with predicted ones. As in this study the SWOT technic was used for analyzing the related matrixes, two questionnaires were used for ranking factors and determining factors coefficient which their content bases and results have obtained from interviews.

Data were collected from various samples, then the analysis was carried out, and at last, data were analyzed based on the reference framework, similarly a case study is done based on type of study, data are analyzed using theoretical deduction strategy and pattern matching method. Obtained data were categorized by Swot technic in four groups, namely strength, weakness, opportunity and threats and they are ranked based on priority. Determining the coefficient of factors was done based on ANP technic and finally, researcher devised the effective strategy.

Results: Considering the weaknesses, strength, opportunities, threats, this table was prepared. Strengths, weaknesses, opportunities and threats

variable	description
S_1	Presence of expert and specialized staff for management of agricultural section
S_2	Collaboration of agricultural research center regarding quantitative and qualitative enhancement of agricultural products and identifying strategic products
W_1	Low quality of agricultural products due to lack of collaboration between farmers and agricultural Jihad
W_2	Lack of sufficient information of farmers of species resistant against water shortage and selecting species appropriate to water resources
O_1	Political willpower for improving agricultural status and leading role of agriculture system in defining resistive economy
O_2	Political willpower for improving agricultural status and leading role of agriculture system in defining resistive economy
O_3	Existence of fertile lands and appropriate climate conditions in province, county and rural district
T_1	Smallholder farmers and smallness of farms and uneconomical feature of activities
T_2	Lack of proportion between objectives of higher education system and agricultural production system
T_3	Lack of enough credit for study and development section for operationalizing the new methods of agriculture
T_4	Lack of collaboration and negligence of people toward water shortage

4–2 pairwise comparison between clusters

After conducting comparison between one cluster strategies, pairwise comparisons were conducted between clusters for weighting each one of clusters. It is shown in table 2.

As it can be seen the greatest coefficient is related to strategic group and then, . The inconsistency index was 0.03 and this value is within allowable range less than 0.1 indicating the reliability of comparisons.

4–3 Calculating Super–matrices

Weightless super-matrix: Weightless super-matrix is obtained by combining the pairwise comparisons matrixes between elements in clusters.

Table 2: pairwise comparison between clusters

Strategies group	Strategy title	importance coefficient
	S_1O_1	0.068
	S_2O_1	0.520
O1 group strategies	W_1O_1	0.157
	W_2O_1	0.253
O1 group accumulative co-efficient		1
	S_1O_2	0.280
	S_2O_2	0.319
O2 group strategies	W_1O_2	0.228
	W_2O_2	0.173
O2 group accumulative coefficient		1
	S_1O_3	0.070
	S_2O_3	0.492
O3 group strategies	W_1O_3	0.259
	W_2O_3	0.141
O3 group accumulative coefficient		1
	S_1T_1	0.134
	S_2T_1	0.059
T1 group strategies	W_1T_1	0.260
	W_2T_1	0548
T1 group accumulative coefficient		1
	S_1T_2	0.302
	S_2T_2	0.385
T2 group strategies	W_1T_2	0.183
	W_2T_2	0.130
T2 group accumulative coefficient		1
	S_1T_3	0.247
	S_2T_3	0.530
T3 group strategies	W_1T_3	0.074
	W_2T_3	0.156
T3 group accumulative coefficients		1
	S_1T_4	0.130
	S_2T_4	0.264
T4 group strategies	W_1T_4	0.071
	W_2T_4	0.534
T4 group accumulative coefficients		1

In table 4, the obtained weightless super-matrix is shown

Five high priorities of strategies

5-4 significant advantage of prioritizing by ANP

One can prioritize the strategies of agriculture of Bijar County by conflating ANP model and SWOT analysis.

In this study, strengths, weaknesses, opportunities and threats of agriculture industry of Bijar County have been combined together by SWOT matrix and 28 strategies are designed. Presented strategies have been prioritized by network analysis process. In addition to determining strategies prioritization, importance coefficient of each one of strategies have been specified and this is the significant advantage of prioritization through ANP model, because in addition to deciding nominal priority, their importance are set forth in scale too. Therefore according to findings of study one can note the hybrid
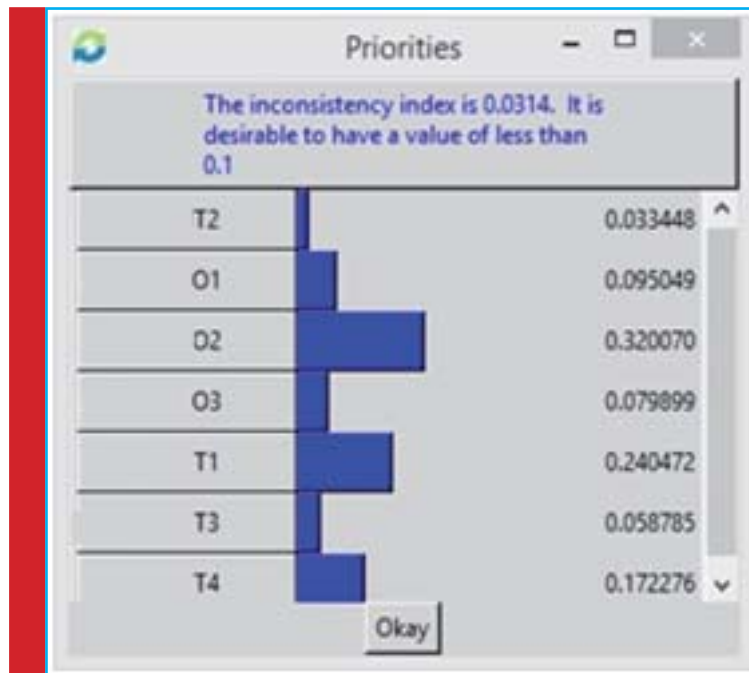
FIGURE 1. Weight coefficient (priority) strategic clusters.

Order of priority	Strategy hybrid parameters	Strategy description
First priority	W_2T_1	Diversifying support tools for supporting producers of agricultural products Diversifying support tools for supporting producers of agricultural products specially for farming species suitable to counties with water shortage conditions.
Second priority	S_2O_2	. Making the agriculture industry purposeful in county fertile regions by identifying strategic crops and investment on them
Third priority	W_2T_4	Attracting the collaboration of farmers in farming resistant products in water shortage conditions and operationalizing the plans related to strengthening the underground water sources.
Fourth priority	S_1O_2	Upgrading the amount of productivity of region fertile lands by adopting specialized plans of experts of agriculture.
Fifth priority	W_1O_2	Encouraging farmers to collaborate with agriculture ministry and increasing productivity coefficient of region farms by selecting and encouraging eminent farmers.

SWOT-ANP model has high efficiency in prioritization of strategies of agriculture industry of Bijar County.

CONCLUSION

Using SWOT matrix, strengths, weaknesses, opportunities and threats have been identified that included two strengths, two weaknesses, three opportunities and four threats. Results suggest more importance of threats when compared with opportunities and equality of strengths and weaknesses in agriculture industry of Bijar County.

Using SWOT-ANP hybrid model, strategies required for using opportunities of agricultural section of the region have been designed, and their priorities have been obtained. For each one of three obtained opportunities, four strategies have been determined, so in sum 12 strategies are available that for using opportunities of the region they are as follows:

1. For better using first opportunity, the best strategy is S_2O_1 that serves as a cornerstone for establishing a dynamic interaction between research centers and agricultural Jihad of Bijar County for guiding and enhancing the county agriculture according to policies of resistive economy.

2. For using second opportunity the best strategy is W_2O_2 that serves as technical preparation and

appropriate supporting of country agriculture for maximum use of fertile lands of Bijar country.

3. For using third opportunity, the best strategy is S_2O_3 that it is supporting to establishing and promoting processing and complementary industries and maintaining farming products of country with collaboration of research centers and agricultural Jihad.

The strength in prioritization by above model is that it is not mere nominal priority, rather the achieved priorities are scale-based which offer importance coefficient of each one of strategies and this gives rise to proper judgment, and rational decision-making.

Using SWOT-ANP hybrid model, strategies required for avoiding threats of agriculture section of the region are devised and their priorities also are obtained. For each one of these 4 threats, 4 strategies are specified, so in sum, there are 16 strategies for avoiding the threats of the region as follows:

1. For avoiding the first threat, the best strategy is W2T1 that is diversifying the support tools for supporting producers of agricultural products especially for farming species appropriate to county water shortage conditions.

2. For dodging the second threat, the best strategy is W_2T_4 is attracting collaboration of farmers to farming crops resistant to water shortage conditions and operationalizing plans related to fostering underground water sources.

3. For dodging third threat the best strategy is S_2T_3 suggesting the use of knowledge and experience of research centers for increasing the attraction of credits of farming strategic crops.

4. For avoiding the fourth threat, the best strategy is S_2T_2 suggesting upgrading the knowledge and skill of graduates of agricultural field by investing in the context of technical complementary educations and making their specialty practical before working in industry.

Using SWOT-ANP hybrid model, we have designed and prioritized strategies that are specified in table 5 in chapter 4.

5 top priority of strategies in table 5 are as follows:

Order of priority	Strategy hybrid parameters	Strategy description
First priority	W_2T_1	Diversifying support tools for supporting producers of agricultural products. Diversifying support tools for supporting producers of agricultural products specially for farming species suitable to counties with water shortage conditions.
Second priority	S_2O_2	.Making the agriculture industry purposeful in county fertile regions by identifying strategic crops and investment on them
Third priority	W_2T4	Attracting the collaboration of farmers in farming resistant products in water shortage conditions and operationalizing the plans related to strengthening the underground water sources.
Fourth priority	S_1O_2	Upgrading the amount of productivity of region fertile lands by adopting specialized plans of experts of agriculture.
Fifth priority	W_1O_2	Encouraging farmers to collaborate with agriculture ministry and increasing productivity coefficient of region farms by selecting and encouraging eminent farmers.

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