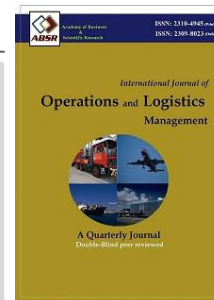




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## Presenting a Strategic Plan of Integrated Water Resources Management by using SWOT in Bushehr Province

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*Arid and semi-arid lands are faced with water stress. In turn of the millennium, many semi-arid and arid regions of the world, including Iran are facing water problems. Shortage of water resources and the mismatch between needs and available resources, the global management of water systems has encountered serious challenges. One of the successful solutions to problems in many parts of the world, experience, participation of water users and other stakeholders in water resource management, which has become imperative. Strategies require a realistic understanding of the surrounding environment. Outside, joined the opportunities available to companies and organizations, and also in the direction they make threats. In this study, in order to derive strategies for in management of water resources, SWOT strategy formulation technique which is used by internal and external factors affecting watershed groups, mining strategy and quantitative Strategic Planning Matrix using the group selects strategies. For this reason, the weaknesses, strengths, opportunities and threats of the use of experts and experts in the field of water and a review of studies in the field and brainstorming and group decision-making and the extraction rate and rank the importance of each of the factors in evaluation matrix were determined. According to the results, the strengths and overcome their weaknesses and water resources with more threats than opportunities facing. The Strategies Group WT (defensive strategy) selected in this way were identified as strategies to implement them, possibility of achieving the goals and vision of providing water.*

**Keywords:** water resources management, strategic analysis, Bushehr province

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## INTRODUCTION

Occurrence of water management may be time to start living humans and agriculture is linked by the river. Bushehr province has a warm and dry climate, structure of the Achaemenid and Sassanid blue traces represent the people and government of the water. So that available resources are not only supplying the needs of the present generation, but also for the future generations will not remain. One of the requirements of today's water sector, in close coordination between the different sectors of water use such as agriculture, industry, etc. optimize the use of available water resources. Water is one of the biggest challenges of this century that could be the source of many of the developments. Reducing the supply and the demand in the world has undoubtedly led to vacuum creating crisis. This imbalance in the local, regional, national or global dimension is inhibited only by the set of management guidelines. The human need to create a series of coordinated measures to develop sustainable admitted to create a balance between sources and uses of water (Khan, Voss, Yu, & Michael, 2014). Complex decisions multilateral coordination, interaction and balance between costs and resources to create components and the corresponding changes of direction, makes clear the need for management and planning. However, evidence suggests that 98% of waste water through human resources and mismanagement of water resources and the correct pattern of consumption is caused according to the normal position Bushehr province management of water resources is very important (Comair et al., 2014). Strategic approach in the management of water resources, based on the total views, policies, structures and systems are effective in this context, the possibilities of sudden occurrence of a crisis and prevent future and contributes to the sustainable development of resources. Strategic management is the strategic approach put forward step. A strategic approach to its meaning, is to build on positive factors in order to be able to confront and eliminate the negative factors are (Davari, 2004).

One of the important steps in the implementation of strategies for water resources, it is set and setting, methods and models are there for this

purpose, each of these models Havb concept of special insights and techniques and follow specific instructions. Among them, the matrix SWOT strengths, weaknesses, opportunities and threats assessment system, it is more common and more popular (Setbrok Hill, 1997). This is a new tool for performance analysis and strategy formulation, design and evaluation strategies are used (Nelson, 2001). Berneroidr (2002) believes that strategic planning is necessary to develop a final strategy, all agents as part of a strategic planning process to be considered in the context of a SWOT analysis. SWOT method to check all internal and external factors affecting the basin strategies tailored to the region and contribute to the sustainable development of water resources in the region will extract. Among the applications of this technique in the field of water resources management can be done by Galkv - Ayala et al (2011) noted which utilizes the SWOT method to derive strategies in integrated management of water resources in Mozambique has the results of this study indicate the need for strategic management by a combination of factors is involved in the opportunities and threats SWOT group (Rehana & Mujumdar, 2014). Due to the application of SWOT strategy formulation in water resources management can provide acceptable results, in this research the strategic management of water resources Bushehr province that always faces a shortage of water resources, using this method to derive strategies is proportional to the area. In this regard, the method of brainstorming is a group decision-making procedure and to achieve the vision of the area has been derived factors SWOT matrix and then index and rank the importance of these factors. Quantitative Strategic Planning Matrix strategies using the best-known group and strategies will be extracted (Koch, Vögele, Kaltofen, Grossmann, & Grünewald, 2014).

## GENERAL CHARACTERISTICS OF THE STUDY AREA

Bushehr in southern Iran, and between 27 degrees and 14 minutes north width 6 minutes and 50 degrees 52 degrees 58 minutes east longitude from

Greenwich is a half day. Bushehr province with an area of about 4.1 square kilometers 5/23167 percent of the total area devoted to his country and in this respect is the seventeenth provinces. Census 2011 population is 1,032,949, respectively. The northern province of Khuzestan province and graduated and Boyer Ahmad, south of the Persian Gulf and part of the province, east of the province west and the Persian Gulf is limited. Bushehr province Persian Gulf with over 600 km of the border is blue and the importance of strategic, economic and tourism is noticeable.

Statistics show hydrology and meteorology of the region's proximity to the equator and low altitude hot weather is generally warm and dry in the province and the coast is hot and humid. According to data from the Meteorological Organization, the absolute maximum temperature of over 50 ° C the absolute minimum temperature is slightly lower than 0 ° C. Average annual temperature of around 25 degrees Celsius Bushehr. Average annual rainfall is 220 mm Bushehr province occurs in autumn and winter. Generally Bushehr province 6 months in warm, temperate and cold for almost two months and four months of the year is mild to warm. Not on the beach but the temperature is somewhat moderate moisture rises in some months, so that it reaches saturation. The air from the air bellows falls verb passivity and inactivity is the sultry called to say. Relative humidity is almost uniform throughout the year and an annual average of 65 percent (Statistical Yearbook Bushehr province, 2009). Precipitation lines on a map that has been prepared in Bushehr province meteorological studies of atmospheric fallout of an average of about 6 billion cubic meters per year respectively (Giupponi, 2014). However, assuming the 20% of the flow becomes shallow, surface currents can be said that the total annual average of about 2/1 billion cubic meters. In addition, the surface Bushehr province includes permanent rivers, seasonal and is happening as part of the Persian Gulf basin act. All rivers in early spring flooding and a lot of them due to specific climate and seasonal events among these rivers, "may", "dalaki" and "Shapur" are permanent, often "come from the Zagros Mountains in the province. Bushehr province has a capacity of 670 million cubic meters Dam (Dam Ali

Delvari) and three irrigation networks of 17,000 hectares, which is about 90% of the area under cultivation is Nakheel. The volume of water entering the network, which is approximately 500 million cubic meters by Shabankareh diversion dams, rivers Shapur Sarqanat and leverage, dalaki and white is bright. The average annual discharge of rivers in the order of about 1,370, 420, 410 million cubic meters, a total of 2/2 billion cubic meters of surface flow into the neighboring provinces Bushehr province annual mean surface currents on the order of 6/3 billion cubic meters.

One of the province's water resources (Hamilton et al., 2014), water is the Persian Gulf. Throughout the South and West of the province is along the Persian Gulf. Abundance of water, groundwater, especially in situation of shallow wells contributed. Beaches and Ports and part of the province is many of the wells after discharge period, in relation to seawater, brackish and become unusable. In some parts of the desalination of sea water is used for urban purposes. According to available information, approximately one billion cubic meters of water consumed in Bushehr province of which 87 percent in agriculture, industry, and the remaining 2% in the drinking. The annual consumption of 115 million cubic meters of drinking water Bushehr province that 90 percent of Fars and Kohgiluyeh and Boyer entered (Zhang & Li, 2014).

## METHODS

This research method and the analytic field is done by using SWOT. A questionnaire survey of experts and professionals has been used in the water sector that their number is 16. The questionnaire consists of five sections, the first section of information respondents and in other four parts of a total of 37 items, including 17 items, weaknesses, strengths 6 items, 5 items, opportunities and threats are 8 items. Identified the strengths, weaknesses, opportunities and threats in the study area during the field study was conducted in two stages. The first stage of the interview strengths and weaknesses, opportunities and threats were identified with the help of experts. In second stage, based on data collected from a questionnaire

in order to determine the coefficients and setting out internal and external factors assess sample analyzes. At the end of the relevant questionnaire to collect, collate and conclusions were based on this information and analysis to help develop appropriate strategies and SWOT, David was presented. WOT analysis is a tool that all the factors in different situations in order to develop and provide acceptable strategies at the regional level, the review and analysis (Mousavi, 2009).

### **THE SWOT ANALYSIS**

1. Gather the required information about the area
2. Collect a group of experts for water as a group decision
3. A report on the region to learn more about the band and explain the objectives and prospects for regional development
4. Brainstorm to identify internal factors (strengths and weaknesses) and external factors (opportunities and threats)

Brainstorming new ideas in a production process is free. Conference and meeting a brainstorming technique that people have the opportunity to easily bring their own ideas and opinions. When brainstorming a term that can be used together for a particular purpose. In this way a group of people in a meeting to discuss and examine and recounted his thoughts sit and talk about it. This is the time when all thoughts to be expressed, read and accept or reject the offer suggestions for the final vote done enough. Generally, after each meeting, "brainstorming" begins with a thought and to find answers to six questions "what, why, where, how, when, and who" come back. Storm brainstorming ideas, or in other words, one of the most effective methods in problem solving in groups (Rawlinson, 1989) the following steps were performed by using the strategic circumstances and factors that were identified in the region.

#### **The method of brainstorming**

- The leader of the group and recorded on board or wherever the subject in view of the group's members and explain it to the people by the

facilitator (a few days earlier the better it is to inform people)

- Remind participants by facilitating the implementation of the rules
- Description of the problems and goals and provide ideas in circulation: at every turn just an idea to be expressed in the absence of an idea by saying the word "next" turn is delegated to another. The economic security and investments in the water sector, the availability of financial and legal capacity of oil and gas development in the water sector, possible utilization of the enormous potential of unconventional water and agro-industrial development Shurvarz, interaction of groundwater, appropriate interaction with neighboring regional companies to improve watershed management and the efficient use of shared virtual water potential.

- Record all ideas by the Secretary of the meeting
- Check if the record ideas saying the word "Next" by all persons
- Classifying, and summarizing the results of the evaluation and selection of the best views  
Comments: in final stage of assessment Comments and if possible with a combination of other views and some were eliminated and the best ideas were selected as a result of the meeting.

1. The input stage: In this stage the main factors required information from inside and outside the organization to develop strategies identified and characterized. This phase includes the evaluation matrix of internal factors and external factors evaluation matrix.

2. The matching stage: In this stage the main internal factors (the swan and weaknesses) and external main factors (opportunities and threats); using tools such as SWOT matrix (SWOT) and internal and external matrix (EI) are adapted to identify strategies that are tailored to the internal and external factors.

3. The decision stage: In this stage using Quantitative Strategic Planning Matrix (QSPM) different options strategies identified in the implementation phase, evaluated and judged and determined their relative attractiveness.

## The input stage

### A) Internal factor evaluation matrix (IFE)

Internal factor evaluation matrix is the result of a strategic review of internal factors. The matrix formulation and evaluation is the strengths and weaknesses of the original. For the preparation of this matrix, the following steps should be taken:

1. The internal factors, known factors listed first identify strengths and weaknesses and written.
2. The weight factor is given to the factors listed. The coefficient of zero (unimportant) is to one (very important). Coefficient indicates the relative importance of the factors of success in the region is the sum of the coefficients must be equal to one.
3. When you place internal factors, the strengths and weaknesses grade 3 and 4 will be ranked 1 and 2. Level 3 and Level 4 means the relative strength means the strength is essential. Rank 2 and rank of 1 means that the relative weakness represents a fundamental weakness.

If the final score is the internal factors of 1 to 5.2, 2.5 to 4 are meant as an expression of weakness and strength. Therefore, the number 2.022 in table means the relative weakness in the region.

Analysis of internal factors (strengths and weaknesses)

#### TABLE 1 HERE

### B) External factor evaluation matrix 1 (EFE)

Evaluation Matrix external factors, external factors are the result of a strategic review. The matrix formulation and evaluation of opportunities and threats is external environment. For the preparation of this matrix, the following steps should be taken:

1. The external factors, known factors listed the factors that lead to future opportunities and the factors that threaten the region will be written.
2. The weight factor is given to the factors listed. The coefficient of zero (unimportant) to one (very important) is. Coefficient indicates the relative importance of the factors of success in the area concerned. The sum of these coefficients must be equal to one.

3. When you place an external factor, the opportunities and threats, opportunities and threats rank 1, 2, 3 and 4 are given. Level 3 and Level 4 means relative chance means an opportunity is fundamental. Rank 2 and rank the relative threat means a significant threat to the fundamental.

4. Multiply the coefficient of each factor in order to obtain the final score.

5. The final points belonging to each of the points is determined by external factors.

Inventory Table

If the external factors influencing the final score is 1 to 5.2, 2.5 to 4 is meant to represent a threat and an opportunity. Therefore, the number 2.23/2 in Table 3 indicates the relative threat in the region.

Analysis of external factors (opportunities and threats)

#### TABLE 2 HERE

## Phase Matching

### A) The SWOT matrix

SWOT analysis is a term used to identify internal strengths and weaknesses and the opportunities and external threats that a system can be applied to faces.

SWOT analysis systematically identifies factors that should be the best strategy is consistent with it (Piers and Robinson, 2003).

SWOT, a strategic tool for matching strengths and weaknesses is opportunities and threats within the system outside the system. The systematic analysis model to identify the factors and select strategies that best fit between them creates offers. From the perspective of this model is a good strategy to maximize strengths and opportunities and weaknesses and threats to its minimum. For this purpose, strengths, weaknesses, opportunities and threats in four general SO, WO, ST, WT are linked and the strategies to be elected from among them (Harrison and John, 2003). Another application of the SWOT model is the key opportunities and threats are external to systematically with internal weaknesses and strengths of a structured approach

are compared. The purpose of this comparison is to identify a specific pattern to fit four internal and external situations.

1. Strategies SO: Using internal strengths tries to exploit opportunities abroad.
2. Strategy: ST researcher tries to use the strengths, the effects of threats in the external environment has reduced or eliminated.
3. Strategies WO: Using opportunities in the external environment, attempts to reduce or eliminate their internal weaknesses.
4. Strategies WT: The researcher tries to reduce internal weaknesses and threats arising from the external environment are also avoided.

It should be explained to the strategy of aggressive strategies SO, WO conservative strategy, ST competitive and ultimately WT defensive strategies.

Table matrix of strengths, weaknesses, opportunities and threats (SWOT)

### **TABLE 3 HERE**

#### ***B) Internal and external matrix***

For the simultaneous analysis of the matrix of the same name is used internally and externally. For this purpose the sum obtained from the evaluation of internal and external factors in the horizontal and vertical axes of the matrix can be placed. Typically used as a matrix grid matrix is close correspondence.

Score obtained on the basis of internal and external factors, strategies are selected in one of four positions. The priority level determines the type of strategy. Generally, internal and external evaluation matrix is shown in Fig.

#### ***Tiled Matrix internal and external (IE)***

### **FIGURE 1 HERE**

Strategies combination of weaknesses and threats that defensive strategies group (WT) are specified using the matrix obtained in Fig.

The strategy aims to reduce internal weaknesses and avoid threats from the external environment (Jung, Lee, Choi, & Hong, 2014). The overall objective of the strategy, defense, at least - at least

(which can be "survival strategy" is called, reducing the weaknesses of the system to reduce and neutralize the threat, in fact; such an organization will fight for their survival.

#### **Decision stage**

#### ***Quantitative Strategic Planning Matrix (QSPM)***

Quantitative Strategic Planning Matrix is one of the tools or methods that will allow the strategist due to the success of the internal and external factors that are already known, it is possible to objectively evaluate various strategies.

#### ***Matrix QSPM***

An analytical method by which is the relative attractiveness strategies are identified. The decisive factor in determining the extent to which it can be successfully used both internally and externally.

The right column of the matrix consisting of internal and external factors (the matrix (IFE, EFE was different strategies are possible in the top row (from the Matrix (SWOT written. In second column of the matrix coefficients can be written evaluation of internal and external factors.

The following steps must be taken to provide a matrix QSPM:

- Major external opportunities and threats, strengths and weaknesses internal to the right side column of your matrix.
- For each of the internal and external factors weight matrix IFE, EFE as a factor in the second column, write.
- Based on the SWOT matrix strategies that organizations can use to determine the cause.
- The attractiveness of each strategy in relation to each factor to determine.
- Grades are attractive with this form:  
= 1 without appeal, 2 = somewhat attractive, 3 = 4 = very attractive and reasonably attractive.
- Find the sum of the scores of attractions: the purpose of collecting scores in grades attraction attraction is the product of the coefficients.

Attractiveness scores indicate the relative attractiveness of each strategy to collect them.

- Calculate the total score of the appeal.
- Any strategy that will further raise the attractiveness of your choice (David, 2009).

**TABLE 4 HERE**

QSPM prioritization matrix using strategies that were appropriate to the situation (defensive strategies) occurs. There are defensive strategy of the organization should implement in order to achieve the objectives, but the answer to the question of which of these strategies has higher priority, according to the experts of the matrix will QSPM. The matrix of all the opportunities, threats, strengths and weaknesses of the organization with their importance weights are the decision table specifies that the implementation of the strategy and how to take advantage of strengths and opportunities and avoiding threats and cover the weaknesses. Mean scores on the evaluation of defensive strategies Quantitative Strategic Planning Matrix, Strategy and amendment of laws and regulations concerning the management of water resources was chosen as the best strategy.

According to our results, the following strategies as optimal strategies are proposed in order of preference:

**TABLE 5 HERE**

**CONCLUSION**

Bushehr province in the country is hot and dry and the rainfall is low and collect water from rainfall is not well most of this water into the sea, as the province is deprived of water supply facilities. Bushehr chronic underdevelopment in the water schemes, as part of the dam and water supply lines in the past several years it has not been attempted. Geography, climate and successive droughts in Bushehr province necessary improvements and is full of all the potential in the province tasks. On the other hand, brackish and saline water sources or unusual, the importance of improving the productivity of the water raises. On the other hand, the main problem is dehydration Bushehr province, but the water is bad which the formation

of governmental institutions and WUAs will be realized. In this study, using the SWOT matrix to formulate strategies in the management of water resources was Bushehr. For this purpose we identify the strategic situation and then set the boundary for separating internal and external factors affecting the region, strengths, weaknesses, opportunities and threats were extracted using group decision. Using this method, and brainstorming session 5 strengths, weaknesses, 8, 6, and 17-threatening opportunity is for the identification and extraction. The coefficient and rank the importance of each of these factors in evaluation matrix was determined. According to the results, the total score of 2.223 is obtained from internal factor evaluation matrix as a result; the strengths and weaknesses are overcome. The total score obtained from external factors evaluation matrix is 2.022 and thus the greater threats or opportunities ahead. Enter the results of the evaluation matrix to matrix analysis of internal and external, strategies Group WT (defensive strategy) as the selected strategies were identified in this way. These strategies include the amendment of laws and regulations on water resources management, capacity building, training, development and capacity building and human resource management in the water sector. Public awareness programs to protect water quality and quantity and optimal utilization of the water resources management change from authoritarian to participatory management balance supply and recovery mechanisms) and quantitative (using Quantitative Strategic Planning Matrix, Strategy and amendment of laws and regulations concerning water management a top priority among other strategies to themselves. Need to change their basic infrastructure. These changes should be done urgently and expeditiously (Aydin, Mays, & Schmitt, 2014). After the studies of very useful information to bring and for the future of the organization is determined. However, these studies should be conducted in periodic intervals as conditions vary over time.

Access to comprehensive and integrated water management sector with direct participation, cultural, social, infrastructure and services within the catchment areas of the province and is

consistent with the climate and environment in order to optimize utilization of water resources, water resources and uses balance between protecting the rights of all stakeholders in the quality and quantity of water resources (natural and human) and equitable access to safe water for all adequate and appropriate model based on the use and value of water and sustainable development of the country may be in the national interest. Much of the water in the province neighboring provinces is the water supply of water pass through long lines and distributed at Bushehr province. One of the main problems of water supply is in the province, the province's aging water lines which resulted in the loss of water. The loss of water due to water shortages faced Bushehr province and water supply for the cities turn to replace or repair the lines, water lines; we will improve the water supply in province (Xiao-jun et al., 2014). Replacement cost of water supply network will be very high and it is not possible at present but the restoration of these networks can largely reduce water loss.

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## APPENDIX

Table 1: Analysis of internal factors (strengths and weaknesses)

No	Strengths	Factor	Significance Rating	Weighted Score
1S	Substrates are necessary for the development of artificial recharge of aquifers and wells and canals for water	0.043	3.4	0.146
2S	Are substrates for the development of industry, mining and ecotourism	0.036	3.2	0.116
4S	Capacity studies, technical and administrative areas and to develop new methods	0.040	3.3	0.133
4S	Wastewater treatment plants and the use of high volume production	0.044	3.6	0.155
5S	Old tradition of using alternative sources of water: rainwater, runoff, rivers, along with the use of new technologies, desalination, wastewater reclamation	0.043	3.5	0.151
6S	Shurvarz and potential use of unconventional waters in	0.038	3.0	0.115
No	Strengths	Factor	Significance Rating	Weighted Score
1W	Proliferation of modern irrigation networks	0.041	1.4	0.060
2W	Poor management of urban water supply and water leakage and losses and low efficiency	0.041	1.3	0.055
3W	Notably groundwater due to over-harvesting quotas and lack of adequate supervision in operation principle of Water Resources	0.048	1.3	0.064
4W	Do not approach the local communities and stakeholders	0.037	1.6	0.057
5W	Lack of facilities and lack of ability to attract and retain the workforce	0.030	1.8	0.054
6W	The lack of appropriate incentive system for employees and managers	0.038	1.4	0.055
7W	Increase in Gain unauthorized wells	0.050	1.3	0.066
8W	Lack of proper culture in efficient water use in agriculture	0.044	1.4	0.063
9W	Lack of proper irrigation system in agricultural sector	0.042	1.3	0.056
10W	Severe threat sources and aquifers in areas where the oil and gas industry	0.049	1.4	0.071
11W	Increasing atmospheric pollution and waste of water resources leading to unusual	0.041	1.4	0.060
12W	The absence of data in studies of soil and water	0.034	1.3	0.046
13W	Expansion of the illegal use of water resources, especially groundwater	0.047	1.4	0.067
14W	saltwater aquifers	0.045	1.4	0.066
15W	Farmers overuse of fertilizers and pesticides and pollution of soil and water resources	0.041	1.3	0.055
16W	Authorities effect of low water problems	0.041	1.8	0.073

17 W	Lack of research centers in water sector	0.037	1.2	0.046
Total		2.022		

**Table 2: weighted Score**

No	Opportunity	Factor	Significance Rating	Weighted Score
1 O	Take advantage of the proximity of the catchment and watershed resources	0.082	3.6	0.294
2 O	Appropriate communication channels to market access	0.062	3	0.186
3 O	There are rules and regulations in the field of water management in country	0.081	3.5	0.282
4 O	Despite the financial backing and the use of loans and facilities	0.079	3.7	0.292
5 O	Improved farming practices	0.091	3.7	0.335
No	Opportunity	Factor	Significance Rating	Weighted Score
1 T	And the spread of desertification in arid and semiarid climate	0.076	1.2	0.091
2 T	Expert views on the principles of sustainable development in absence of watershed management	0.082	1.3	0.103
3 T	Valuation is based on the actual price fluctuations and lack of water	0.073	1.4	0.102
4 T	Indiscriminate harvesting of water resources and the loss of this strategic resource	0.091	1.2	0.109
5 T	Economic deprivation and lack of access to resources needed for the development of water resources	0.053	1.7	0.091
6 T	Drought and climate change and environmental	0.069	1.5	0.104
7 T	Heavy reliance on surface water and drinking neighboring provinces	0.082	1.6	0.131
8 T	Lack of overall ecological efficiency in water	0.080	1.3	0.104
Total		2.223		

**Table: 3 Matrix of strengths, weaknesses, opportunities and threats (SWOT)**

SWOT		Strengths	Weaknesses
		S <sub>1</sub> S <sub>2</sub> S <sub>3</sub> S <sub>4</sub> S <sub>5</sub>	W <sub>1</sub> W <sub>2</sub> W <sub>3</sub> W <sub>4</sub> W <sub>5</sub> W <sub>6</sub> W <sub>7</sub> W <sub>8</sub>
Opportunity		SO Strategies	WO strategies
O <sub>1</sub> O <sub>2</sub> O <sub>3</sub> O <sub>4</sub> O <sub>5</sub> O <sub>6</sub>		<ol style="list-style-type: none"> <li>1. The management of knowledge and the application of science and technology and research on the industry.</li> <li>2. The development and operation of integrated programs of surface water, groundwater and unusual.</li> <li>3. Improving water productivity in the agricultural sector through methods such as irrigation, cultivation correction pattern and composition, reducing water evaporation, greenhouse cultivation</li> <li>4. Preservation, restoration and sustainable use of water historic structures.</li> </ol> <p>By utilizing the strengths of opportunities to use.</p>	<ol style="list-style-type: none"> <li>1. Supervising in operation and avoid the indiscriminate harvesting of aquifers based on existing laws</li> <li>2. Increase efficiency and reduce leaks and losses in water distribution systems to implement legislation</li> <li>3. The development of modern irrigation systems with Holly and legal background and culture of the education stakeholders</li> <li>4. Preparation of a comprehensive program to prevent contaminated water from entering the natural cycle</li> <li>5. Change the style from traditional to modern irrigation and construction of water channels and concrete</li> <li>6. Replacement of worn-out networks in rural and urban water</li> </ol> <p>By utilizing the opportunities and weaknesses to be destroyed</p>
Threats		ST strategies	WT Strategies
T <sub>1</sub> T <sub>2</sub> T <sub>3</sub> T <sub>4</sub> T <sub>5</sub> T <sub>6</sub> T <sub>7</sub> T <sub>8</sub> T <sub>9</sub> T <sub>10</sub> T <sub>11</sub> T <sub>12</sub> T <sub>13</sub> T <sub>14</sub> T <sub>15</sub> T <sub>16</sub> T <sub>17</sub>		<ol style="list-style-type: none"> <li>1. Apply different ways of managing water use and prevent water loss in transmission and distribution networks in urban and rural water</li> <li>2. Drinking patterns of water use in agriculture, industry and climate</li> <li>3. Determine the health and environmental policy for drinking water sources</li> <li>4. Developing methods for coping with drought and flood risk management</li> <li>5. The establishment of water pricing based on cost approach to enhance productivity</li> </ol> <p>To avoid the threat of use of force.</p>	<ol style="list-style-type: none"> <li>1. The shift from authoritarian to participatory management of water resources management</li> <li>2. Improve mechanisms for providing balance( and quantitative )</li> <li>3. The amendment of laws and regulations concerning the management of water resources</li> <li>4. Public awareness programs for the conservation and optimum utilization of water quality and quantity</li> <li>5. Capacity building, training, management and human resource development and capacity building in the water sector.</li> </ol> <p>Reduce your weaknesses and avoid threats</p>

**Table 4: variety of strategy**

Applicable to a variety of strategies (strategies repellent WT)										Important factor	The main elements of the strategic
Strategy 5		Strategy 4		Strategy 3		Strategy 2		Strategy 1			
Score	Interest rate	Score	Interest rate	Score	Interest rate	Score	Interest rate	Score	Interest rate		
<b>Strengths</b>											
0.09	2	0.09	2	0.13	3	0.09	2	0.09	2	0.043	S <sub>1</sub>
0.07	2	0.04	1	0.11	3	0.07	2	0.07	2	0.036	S <sub>2</sub>
0.12	3	0.12	3	0.16	4	0.12	3	0.16	4	0.040	S <sub>3</sub>
0.09	2	0.13	3	0.13	3	0.17	4	0.09	2	0.044	S <sub>4</sub>
0.09	2	0.09	2	0.17	4	0.17	4	0.09	2	0.043	S <sub>5</sub>
0.11	3	0.11	3	0.15	4	0.15	4	0.15	4	0.038	S <sub>6</sub>
<b>Weakness</b>											
0.12	3	0.12	3	0.12	3	0.08	2	0.08	2	0.041	W <sub>1</sub>
0.12	3	0.12	3	0.17	4	0.12	3	0.08	2	0.041	W <sub>2</sub>
0.1	2	0.1	2	0.15	3	0.19	4	0.5	1	0.048	W <sub>3</sub>

0.07	2	0.07	2	0.11	3	0.04	1	0.15	4	0.037	W <sub>4</sub>
0.09	3	0.09	3	0.06	2	0.03	1	0.12	4	0.030	W <sub>5</sub>
0.15	4	0.11	3	0.11	3	0.04	1	0.15	4	0.038	W <sub>6</sub>
0.13	3	0.13	3	0.13	3	0.2	4	0.05	1	0.050	W <sub>7</sub>
0.17	4	0.17	4	0.13	3	0.09	2	0.17	4	0.044	W <sub>8</sub>
0.17	4	0.17	4	0.17	4	0.13	3	0.08	2	0.042	W <sub>9</sub>
0.15	2	0.15	3	0.2	4	0.2	4	0.1	2	0.049	W <sub>10</sub>
0.08	2	0.12	3	0.12	3	0.17	4	0.08	2	0.041	W <sub>11</sub>
0.1	3	0.1	3	0.1	3	0.03	1	0.1	3	0.034	W <sub>12</sub>
0.09	2	0.09	2	0.14	3	0.19	4	0.09	2	0.047	W <sub>13</sub>
0.09	2	0.09	2	0.14	3	0.18	4	0.09	2	0.045	W <sub>14</sub>
0.08	2	0.12	3	0.12	3	0.17	4	0.08	2	0.041	W <sub>15</sub>
0.12	3	0.12	3	0.12	3	0.04	1	0.12	3	0.041	W <sub>16</sub>
0.15	4	0.15	4	0.11	3	0.04	1	0.11	3	0.037	W <sub>17</sub>
2.4		2.45		3.05		2.71		2.8			The total internal
<b>Opportunity</b>											
0.16	2	0.16	2	0.24	3	0.24	3	0.08	1	0.082	O <sub>1</sub>

0.12	2	0.12	2	0.19	3	0.06	1	0.12	2	0.062	O <sub>2</sub>
0.24	3	0.24	3	0.32	4	0.16	2	0.16	2	0.081	O <sub>3</sub>
0.32	4	0.24	3	0.24	3	0.16	2	0.32	4	0.079	O <sub>4</sub>
0.27	3	0.27	3	0.27	3	0.27	3	0.18	2	0.091	O <sub>5</sub>
<b>Threats</b>											
0.23	3	0.23	3	0.3	4	0.3	4	0.15	2	0.076	T <sub>1</sub>
0.3	4	0.3	4	0.3	4	0.2	3	0.3	4	0.082	T <sub>2</sub>
0.22	3	0.22	3	0.22	3	0.15	2	0.22	3	0.073	T <sub>3</sub>
0.36	4	0.27	3	0.27	3	0.36	4	0.18	2	0.091	T <sub>4</sub>
0.16	3	0.16	3	0.21	4	0.11	2	0.11	2	0.053	T <sub>5</sub>
0.21	3	0.21	3	0.21	3	0.21	3	0.14	2	0.069	T <sub>6</sub>
0.2	3	0.2	3	0.2	3	0.2	3	0.16	2	0.082	T <sub>7</sub>
0.24	3	0.24	3	0.32	4	0.16	2	0.24	3	0.080	T <sub>8</sub>
3.03		2.86		3.29		2.45		2.49		%100	The total external
5.43		5.31		6.34		5.16		5.29			Total Score strategy

### Quantitative Strategic Planning Matrix

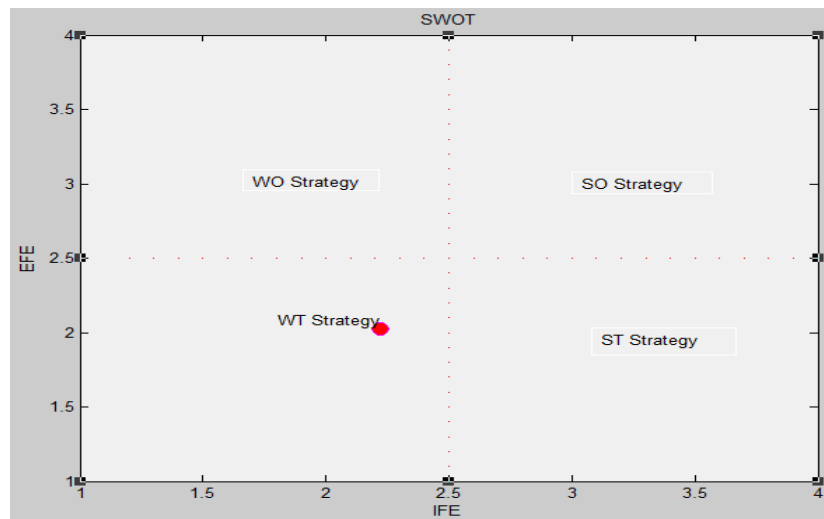


Figure 1: Tiled Matrix internal and external (IE)