Desalination and Water Treatment
www.deswater.com
doi: 10.5004/dwt.2023.29303

285 (2023) 189–203
February

Develop and prioritize domestic wastewater use scenarios with SWOT and QSPM analytical matrices — case study: Sabzevar City treatment plant

Seyed Ahmad Nourbakhsh, Hossein Hassanpour Darvishi*, Hossein Ebrahimi

Department of Civil Engineering, Faculty of Engineering, Shahr-e-Qods Branch Islamic Azad University, Tehran, Iran, Tel.: +98 2146896000; emails: hhassanpour87@gmail.com (H. Hassanpour Darvishi), sanoorbakhsh26@gmail.com (S.A. Nourbaksh), ebrahimi165@yahoo.com (H. Ebrahimi)

Received 13 August 2022; Accepted 15 January 2023

ABSTRACT

Reuse of treated wastewater depends on public acceptance and involvement, which require careful assessment and evaluation. In this study, using the combined model of SWOT-QSPM analysis matrix, the using effluent from the Sabzevar treatment plant were investigated. Based on the results of effluent experiments, the Sabzevar treatment plant effluent use for agriculture due to the coliform outside the permitted range recommended in Iranian and international standards, requires further disinfection of the effluent before use. However, in general, according to the results obtained from the study of chemical and microbial quality of effluent, and comparison with standards in most of the years studied show that the quality of the Sabzevar municipal wastewater treatment plant effluent is within the permissible limits of the mentioned standards and it can be used for irrigation of forage plants or urban green space which is not used directly by humans. Also considering that the general public is not interested in using wastewater for irrigation or any other type of use., we should seek to create a culture by holding events at the level of councils, villages and rural people. In addition, due to the desert nature of the area, the effluent can be used for biological desertification, planting rangeland plants such as *Nitraria* and *Haloxylon*, and species such as Atriplex. Also, due to the existence of factories such as Sand washing and cement factories in the region and the reasonable price of effluents and water saving, the conditions of using effluents in such factories can be considered through study, research and expertise.

Keywords: Sabzevar wastewater treatment plant; Wastewater reuse; Stabilization lagoon; SWOT; Quantitative Strategic Planning Matrix

1. Introduction

The effluent from municipal wastewater treatment plants is one of the water resources that can be used in agriculture and green space. Today, the issue of water scarcity and environmental degradation is one of the biggest problems of human societies. Under these conditions, wastewater treatment and recycling is the most important strategy in the development of water resources management that can play an important role in relation to water scarcity problems such as forage irrigation, desert management and desertification by planting and irrigating rangeland plants [1]. due to water global scarcity, the use of treated wastewater for crop irrigation is required; however, if the wastewater treatment is inadequate, it can be a source of environmental pollution [2].

Reuse of treated wastewater could provide a key solution to address sustainable water resources management in agriculture. However, the success of this project depends on public acceptance and involvement, which require careful assessment and evaluation [3]. However, the worldwide amount of treated wastewater reuse is still very small (less than 1%) compared to the total withdrawal

* Corresponding author.

of water [4]. In Mediterranean countries like Greece, Italy and Spain, where water scarcity is more severe, the reuse is between 5% and 12% while in Europe, an average of 2.4% of the total wastewater is reused [3]. Although wastewater treatment technologies are available, but many countries have experienced public resistance to the adoption of new water projects [5,6]. Acceptance by the public is indeed crucial to locate, finance, develop and operate any wastewater treatment plant while public participation is essential to meet the particular needs, channel local knowledge to improve the design of the project, and build institutional trust [7]. When addressing the issue of public acceptance towards wastewater treatment and reuse, analysis should also include investigation around the attitude towards the environment and the concern of the public for the future generations [8]. Scientists and water managers agree that positive community attitude regarding this alternative source is critical [9–11]. The overall purpose of wastewater reuse in agriculture is to conserve drinking water resources. Experience has shown that the presence of significant amounts of substances such as phosphate, potassium and nitrogen in wastewater, all of which play a key role in the fertility of agricultural lands, has been Increasing the agricultural products yields. On the other hand, due to the supply of water for agriculture, this can play an effective role in controlling and decrease the migration of villagers to cities. Due to the development of wastewater treatment technologies in the world, it is possible to treat wastewater with a wide range of effluent quality. such as the effluent ranges from suitable quality for drinking to very low quality [12].

Saliba et al. [3] In order to promote treated wastewater reuse in a Mediterranean region, in their research, the opinion of key stakeholders by eliciting and structuring their attitudes and willingness towards the reuse of treated wastewater analyzed. Results demonstrated a high level of acceptance of wastewater reuse among the Apulian stakeholders, southeastern region of Italy, both farmers and citizens/consumers, respectively 59% and 87%. Central to the discussion is that the majority of farmers does not always choose to use treated wastewater but is willing to exploit its benefits occasionally.

Khaskhoussy et al. [13] evaluated the accumulation of elements in corn field soil under irrigation with treated effluent and different irrigation methods. The results of soil tests showed that the treated wastewater increased electrical conductivity, nutrients and heavy metals. In addition, the results showed that irrigation with treated effluent increased nitrate reductase activity and chlorophyll production.

SWOT analysis matrix is one of the most practical models used in determining strategy for different industries. Including the four words is strengths, weaknesses, opportunities and threats and its efficiency has been confirmed by various researchers [14–16] and among the strategy formulation models, the SWOT model is one of the most efficient models in formulating strategies [17,18].

Farzi and MehrAbadi [19] in a study entitled Systematic Analysis of Strengths, Weaknesses, Opportunities and Threats of Reuse the Gray Water Based on the Combined Fuzzy Hierarchical Analysis Process-SWOT analysis was identified and prioritized in a systematic in Iran. The results indicate that negative external factors (threats) are of relatively higher importance and as a result will have a greater impact on the development of this system in Iran.

The use of wastewater as a source of water in irrigation of agricultural products in compliance with environmental considerations should be considered as part of sustainable management given the state of the water crisis. Reuse or recycling have a special place so that wastewater is not considered as a wastewater but as a renewable source. Given that not much research has been done in the field of planning for reuse gray water as one of the unconventional water sources in Iran, conducting a SWOT analysis with the aim of identifying strengths, weaknesses, opportunities and threats related to this method and related strategies is needed. It will be useful for charting a brighter future for the reuse of gray water in Iran. In this study, strategies for proper use of wastewater according to the conditions and characteristics of wastewater of Sabzevar treatment plant in comparison with international standards such as United States Environmental Protection Agency (EPA), World Health Organization (WHO), World Food Organization (FAO) and the standards of the Environment Organization of Iran, prioritized using SWOT management analysis also, the strategies selected from the SWOT matrix will be ranked and prioritized using the Quantitative Strategic Planning Matrix (QSPM) matrix.

2. Study area

Sabzevar is a city with historical antiquity in the west of Khorasan Razavi province and northeast of Iran. The eastern and northern of this city are mountainous and have a temperate climate and are accompanied by warm weather in the plains. There are only one seasonal river called Kalshour in this area that lead the floods of Sabzevar plain to the desert salt fields of the central desert of Iran. The city is located at a longitude of 57° and 43′ and a latitude of 36° and 12′ and its altitude is 950 m above sea level, the average annual rainfall is 330 mm, the average relative humidity is 43% and the prevailing wind is east–west. The minimum and maximum annual-maximum-temperature in Sabzevar City fluctuated between 11.9 and 39.7 and the average annual maximum was 25°C.

Sabzevar municipal wastewater treatment plant is located 5 km southeast of the city, its treatment system is lagoon (stabilization pond) method with an average capacity of 2,000 m^3/d. The average inlet of the treatment plant during 3 y (2006, 2007 and 2008) was 157 and its outlet was 146.8 L/s, which shows 6.7% of evaporation, which was 11.6% in summer. To treat wastewater in the world, several methods have been designed and presented, the use of each method depends to a large extent on the climatic conditions and the executive capabilities of the region. Due to the hot and dry conditions of the region and the existence of much land in the region, the stabilization pond method (stabilization lagoon) has been used in Sabzevar municipal wastewater treatment plant. Stabilization ponds are pools with different depths and man-made in which wastewater accumulates and after staying for a few days, a high-grade effluent is discharged [20]. Fig. 1 shows the geographical location of Sabzevar City and Sabzevar municipal wastewater treatment plant in the southeast of the city.

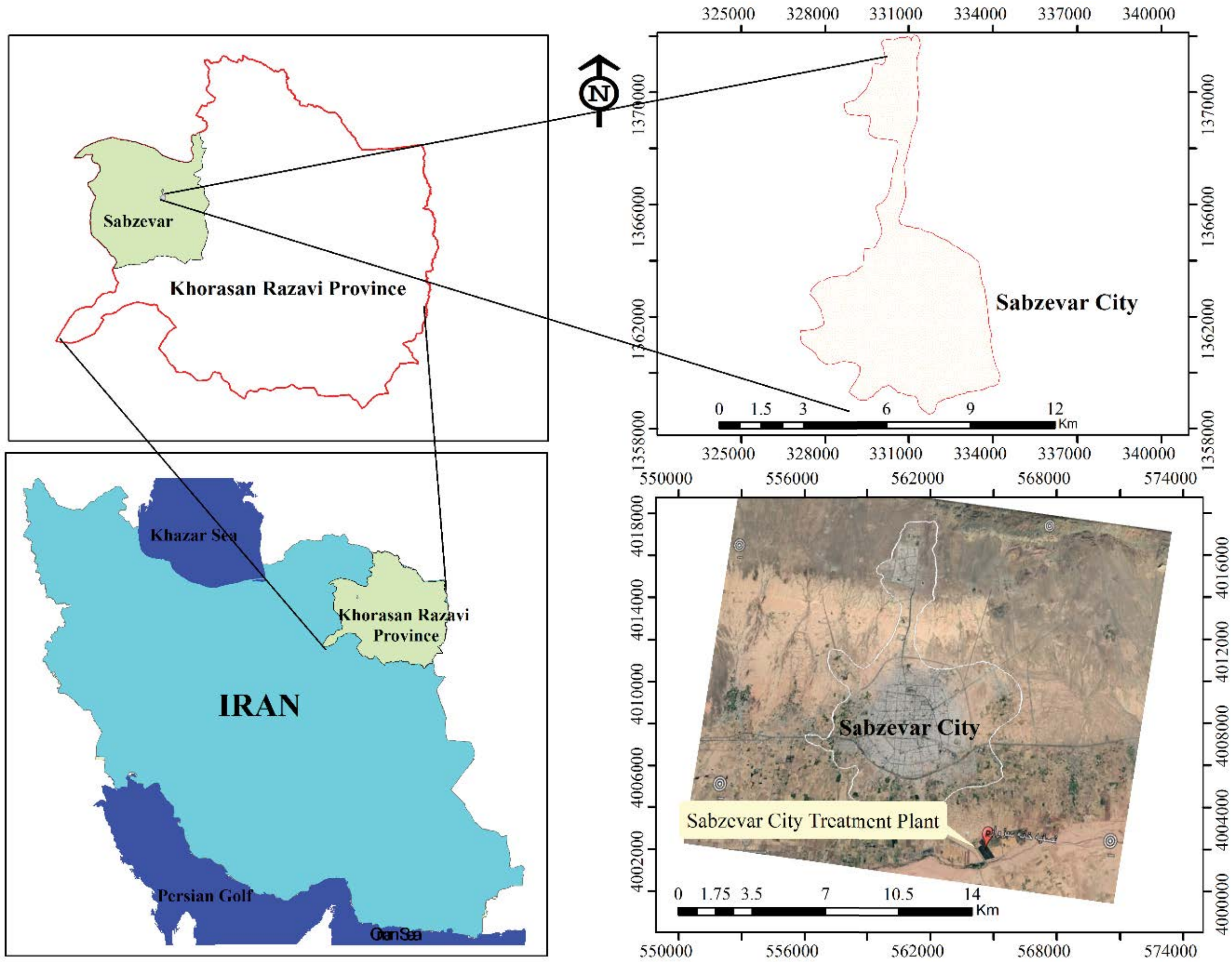

Fig. 1. Location of Sabzevar City and wastewater treatment plant.

3. Methodology

3.1. Sewage and effluent parameters

Sewage and subsequently effluent of various parameters and properties such as biological oxygen demand (BOD_5), chemical oxygen demand (COD), dissolved oxygen (DO), total solids (TS), total suspended solids (TSS), total soluble solids (TDS), coliforms (TC) include fecal coliforms (FC), electrical conductivity (EC), alkalinity (pH), sodium uptake ratio (SAR), phosphorus (TP), intestinal nematode, nitrate, nitrite, suspended solids and soluble in sewage.

3.2. Collecting and measuring the required data

Due to the fact that Sabzevar wastewater treatment plant is a lagoon type. Data and parameters required for use and comparison with the four standards for agricultural use, including the standard of the EPA, WHO, FAO and The Environment Organization of Iran (IRNDOE), was received with annually form period from the treatment plant laboratory. Table 1 describes the limits of the standards mentioned for each of the measured parameters.

Table 1
International and national standards for tests performed in the laboratory of Sabzevar wastewater treatment plant

Parameter	WHO	EPA	FAO	IRNDOE
BOD_5 solution, mg·L^{-1}	–	30	–	100
BOD, mg·L^{-1}	–	30	–	100
COD, mg·L^{-1}	–	120	–	200
COD, mg·L^{-1}	–	120	–	200
DO, mg·L^{-1}	–	–	–	2
pH	6–8.4	6.5–8.4	6.5–8	6–8.5
TSS, mg·L^{-1}	–	5	–	100
TDS, mg·L^{-1}	450	–	450	–
Nitrate, mg·L^{-1}	5	30	5	–
Nitrite, mg·L^{-1}	–	1	–	–
TColiform, mg·L^{-1}	1,000	1,000	1,000	1,000
SAR, (me·L^{-1})$^{0.5}$	3	3	3	–
EC, dS·m^{-1}	0.7	0.7	0.7	–
Nematode	1	1	1	–

Dashed tables show that some parameters have no limits in any of the standards.

3.3. SWOT analysis

The SWOT matrix is a concise and useful analytical model that systematically identifies each of the strengths, weaknesses, opportunities, and threats, and reflects strategies appropriate to the current situation of the region under study. This analysis is based on the logic that an effective strategy maximizes strengths and opportunities, at the same time, it minimizes its weaknesses and threats. In the SWOT matrix, after listing each of the strengths, weaknesses, opportunities and threats and writing them in their respective cells, the desired strategies are obtained from the intersection of each of them. In the present study, field studies (direct observation, interview, questionnaire) and non-field studies (library, office documents and computer database) were used to collect information. In the field method, questionnaires, interviews with individuals and residents of surrounding villages and experts from stakeholders such as the Department of Natural Resources and water and sewage department were used. In the field studies section, in addition to field observations and studies, strengths, weaknesses, opportunities and threats were identified from the research and study of available resources. Tables 2 and 3 present the strengths and weaknesses and opportunities and threats of using the wastewater of Sabzevar water treatment plant for agricultural purposes.

3.4. SWOT evaluation matrix of internal and external factors

This matrix consists of four columns, the first of which lists internal (strengths or weaknesses) or external (opportunities and threats) factors. In the second column, according to the importance and sensitivity of each factor, the coefficient of importance between zero to one (0–1) is assigned to that factor. In the third column, according to the key or normal, the rank of 4–1 is assigned to the strengths and opportunities and the rank of 1–4 is assigned to the weaknesses and threats [21]. The coefficient of importance or sensitivity is determined depending on how decisive and important that factor is, depending on studies, questionnaires and opinions of experts such as university professors. The rank of each factor is also attributed to each factor by questionnaires by experts and stakeholders. In the fourth column, the coefficients of the second column are multiplied by the ranks of the third column for each factor and the final factor score is determined [22,23].

3.5. Forming a matrix of internal and external SWOT factors to formulate strategies

The SWOT matrix has 4 strategies that each strategy under the set of one of the purposes, determines the method of achieving the purpose. Then, in order to achieve each strategy, plans are identified that need to be timed and budgeted.

Strategies (SO) aggressive strategies (Maximum–Maximum): These strategies are related to the internal situation of the organization and evaluate its positive points (strengths) and can create a state of synergy in the organization.

Strategies (WO) adaptive or conservative strategies (Minimum–Maximum): These strategies are related to the internal situation of the organization and evaluate its negative points (weaknesses). The purpose of strategies is to reduce weaknesses and increase opportunities.

Table 2
Strengths and weaknesses (internal factors) of using Sabzevar treatment plant effluent

Strengths	Weaknesses
S1 – Effluent is effective for agriculture and soil fertility due to the presence of minerals and nutrients.	W1 – Limiting conditions of agricultural lands and green space in terms of chemical parameters.
S2 – Location in suitable topographic conditions, proximity to agricultural lands of surrounding villages.	W2 – Religious and jurisprudential issues in the use of wastewater.
S3 – Ability of the area to receive and attract investors in the use of wastewater.	W3 – Cultivated plants with effluent in the area have a limited range.
S4 – Effluent can be used in agriculture due to the removal of organic matter in wastewater in terms of color and odor.	W4 – Opinion on the use of wastewater in terms of unsanitary conditions.
S5 – Effluent greatly reduces the need for chemical fertilizers due to the presence of various nutrients.	W5 – Psychological adverse effects on wastewater use.
S6 – Suitable topography of the area to effluent transfer to consumption areas.	W6 – Lack of facilities and conditions for the distribution of transported effluent in the study area.
S7 – Existence of lands and urban green space suitable for wastewater use.	W7 – Infiltration of effluent into groundwater aquifers used for drinking.
S8 – Effluent as a permanent source of water for exploitation even in times of drought.	W8 – Disease of plants and agricultural products in long-term irrigation with effluent.
S9 – Welcoming farmers to use wastewater due to reasonable price and quality.	W9 – Environmental impacts of wastewater use.
S10 – Existence of suitable communication routes for transfer to the point of consumption (agriculture and green space).	W10 – Existence of some chemical parameters such as salinity, toxic elements, etc. in the effluent.

Table 3
Opportunities and threats (external factors) of using Sabzevar wastewater treatment plant effluent

Opportunities	Threats
O1 – Creating optimal conditions for the use of wastewater (for example, channelling the effluent transfer route).	T1 – Lack of coordination between different organs in order to use effluent in different sections.
O2 – Entrepreneurship and increasing the area under cultivation and consequently using more effluent.	T2 – Possible environmental problems in case of improper wastewater treatment.
O3 – Reverse migration due to unconventional water source and agriculture.	T3 – Problems with effluent transfer to used area.
O4 – Development of villages and settlement of youth and prevention of migration of residents of surrounding villages.	T4 – Problems in effluent irrigation systems.
O5 – Use of effluent in industrial sectors of the city.	T5 – Possibility of creating health problems and risks for farmers.
O6 – Use of effluent in aquaculture and other secondary uses.	T6 – Lack of expertise in the use of wastewater and the use of traditional methods.
O7 – Create a culture the use of non-conventional water sources such as sewage among local people.	T7 – Limited scientific studies in the field of wastewater use.
O8 – Support of relevant government departments to plans to use wastewater in the agricultural and industrial sectors.	T8 – Lack of effluent transfer channel to surrounding villages.
O9 – Replacement of effluent with water from aqueducts and wells in order to protect the aquifer.	T9 – Lack of suitable infrastructure for wastewater use in sectors such as aquaculture.
O10 – exists of desert wastelands for use effluent in desertification and planting of rangeland plants.	T10 – Land acquisition at the site of the effluent transmission line in the villages.

Strategies (ST) contingent or competitive strategies (Maximum–Minimum): These strategies are related to the external situation and evaluate the strengths in relation to the outside. This strategy is based on capabilities against threats and the purpose to increase existing capabilities and reduce threats.

Strategies (WT) defensive strategies (Minimum–Minimum): These strategies are related to the external situation of the organization and evaluate its negative points in relation to the outside. The purpose of this strategy is to reduce threats as much as possible.

To determine the strategies, first the strengths, weaknesses, opportunities and threats were examined by looking at the internal space and external factors, based on which the strategies were extracted using the SWOT matrix. Each strategy in the subset of one of the purposes determines the method of achieving the purpose. Identifying internal and external stakeholders also helps to identify factors [21]. Then, in order to achieve each strategy, plans are identified that need to be timed and budgeted. According to the methods and explanations provided, by placing internal factors in front of external factors, the matrix of interactions of strengths and weaknesses with opportunities and threats is obtained.

If the sum of the total final points in this matrix is more than 2.5, it means that according to the predictions made, the strengths will overcome the weaknesses and opportunities over the threats, and if this score is less than 2.5, it shows the dominance of weaknesses and threats on the conditions of the region. To conduct this study, based on the basic information available in the region and with the opinion of managers and stakeholders, a list of strengths and weaknesses of the region was prepared and made available to 30 experts in this field (Natural Resources Department, Water and Sewage Department, Students and Stakeholders). Was placed to determine the importance factor and rank of each item. Experts were also asked to add to the list if they had a specific factor in mind. Based on this, first the importance factor was multiplied by the rank and then the result was placed as the final weight in the fourth column.

3.6. Quantitative Strategic Planning Matrix

One of the most important techniques and tools in evaluating strategic options and determining the relative attractiveness of strategies that are in the decision-making stage is the Quantitative Strategic Planning Matrix (QSPM). This matrix identifies which of the selected options is more appropriate and, in fact, prioritizes the selected strategies [24].

To prepare a quantitative strategic planning table, the following steps are performed:

- First, internal and external factors and weight score (meaning the same coefficient of importance of factors mentioned in the matrix of internal and external factors) each of them is transferred to the strategic planning table, then all strategies extracted from the SWOT matrix in the top row of the matrix strategic planning is listed;
- To determine the attractiveness or score of each factor in determining the strategy, according to its importance in formulating each strategy, a score of 1–4 is given,

that is, it should be seen how effective that internal and external factor is in achieving strategy;

- In order to obtain the sum of the attractiveness points, the weights of the first stage are multiplied by the points, thus the final weight of the effect of each factor on the mentioned strategy is obtained;
- From the sum of the scores of each column of the strategic planning table, the final score of each strategy is obtained, which indicates the strategies that are more important and scored and are prioritized in some way [24,25].

4. Results

In this section, the results of chemical tests on inlet wastewater and effluent obtained by Sabzevar Wastewater Treatment Plant Laboratory are compared with international and national standards, which are presented in Tables 4–7.

Tables 4–7 show the results of the laboratory in front of international and national standards to determine the allowable limits of effluent parameters and specify which of the effluent parameters of Sabzevar municipal wastewater treatment plant are within the allowable standards.

4.1. Strategy selection

According to the matrix of internal and external factors (Table 10), the strategy and implementation priorities matrix was formed based on the deployment of data in two main dimensions:

- The sum of the final points of the internal factor evaluation matrix that is shown on the horizontal axis (X);
- The sum of the final points of the external factor evaluation matrix, which is written on the vertical axis (Y).

In this matrix, if the position of the study area in terms of scores of external and internal factors is in the first area, offensive strategy, if in the second area, competitive strategy, if in the third house, conservative strategy, and finally, if in the fourth area, defensive strategy. Fig. 3 shows the strategic position of the region by using the matrix of internal and external factors and establishing the scores of the internal and external factor evaluation matrices of Tables 8 and 9 (2.65,2.56) on it. Because the sum of the final points of internal factors on the horizontal axis is 2.56 and the sum of the points obtained from external factors on the vertical axis is 2.65. Therefore, according to the principles of strategic management, the strategic position of the study area in the area of offensive strategy (SO) was determined. The purpose of this strategy is to use strengths by taking advantage of external opportunities [21].

After the management strategies for using the effluent of Sabzevar wastewater treatment plant were obtained, these strategies were prioritized by Quantitative Strategic Planning Matrix (QSPM) and were arranged from 1 to 8, respectively. Therefore using 8 management strategies that resulted from the SWOT matrix and according to the QSPM matrix documentation and placing the points and weight of these strategies against each of the internal factors (strengths and weaknesses) and external factors (opportunities and threats) and ranking of each of these management strategies based on the difference with the number 2.5 mentioned in the SWOT matrix documentation will be selected as the best management strategy [26], which is presented in Tables 11 and 12 of the results of the QSPM matrix.

By summing the final weight obtained by multiplying the coefficient of attractiveness (importance) of each factor in the score of each of the selected strategies based on the effect of that factor on the said strategy (which is a number 1 to 4 for strength and opportunity factors and 4 to 1 for the factors of weakness and threats) the final weight of each strategy was determined for each of the internal and external factors, then each of the weights obtained from the table of internal and external factors were added together and as result the strategies were prioritized according to the difference with

Table 4
Comparison of effluent parameters with International Standards for 2015

Parameter	Average	WHO	EPA	FAO	IRNDOE	Comparison
BOD_5, $mg{\cdot}L^{-1}$	110	–	30	–	100	Above the standard
COD, $mg{\cdot}L^{-1}$	214	–	120	–	200	Above the standard
DO, $mg{\cdot}L^{-1}$	1.5	–	–	–	2	Below the standard
pH	7.98	6–8.4	6.5–8.4	6.5–8	6–8.5	As standard
TSS, $mg{\cdot}L^{-1}$	133	–	5	–	100	Above the standard
TDS, $mg{\cdot}L^{-1}$	405.5	450	–	450	–	Below the standard
TKN, $mg{\cdot}L^{-1}$	90.5	–	–	–	–	–
Ammoniac, $mg{\cdot}L^{-1}$	8.5	–	–	–	–	–
Nitrate, $mg{\cdot}L^{-1}$	23.6	5	30	5	–	Below the standard
Nitrite, $mg{\cdot}L^{-1}$	0.83	–	1	–	–	Below the standard
TP, $mg{\cdot}L^{-1}$	2.8	–	–	–	–	–
TColiform, No. at 100 mL	3,000	1,000	1,000	1,000	1,000	Above the standard
SAR, $(me{\cdot}L^{-1})^{0.5}$	0.8	3	3	3	–	Below the standard
EC, $dS{\cdot}m^{-1}$	0.5	0.7	0.7	0.7	–	Below the standard
Nematode	1	1	1	1	–	As standard

Table 5
Comparison of effluent parameters with International Standards for 2016

Parameter	Average	WHO	EPA	FAO	IRNDOE	Comparison
BOD_5, mg·L^{-1}	128	–	30	–	100	Above the standard
COD, mg·L^{-1}	232	–	120	–	200	Above the standard
DO, mg·L^{-1}	1.79	–	–	–	2	Below the standard
pH	7.99	6–8.4	6.5–8.4	6.5–8	6–8.5	As standard
TSS, mg·L^{-1}	125	–	5	–	100	Above the standard
TDS, mg·L^{-1}	400	450	–	450	–	Below the standard
TKN, mg·L^{-1}	85	–	–	–	–	–
Ammoniac, mg·L^{-1}	7.23	–	–	–	–	–
Nitrate, mg·L^{-1}	21.88	5	30	5	–	Below the standard
Nitrite, mg·L^{-1}	0.66	–	1	–	–	Below the standard
TP, mg·L^{-1}	2.6	–	–	–	–	–
TColiform, mg·L^{-1}	2,500	1,000	1,000	1,000	1,000	Above the standard
SAR, (me·L^{-1})$^{0.5}$	1.2	3	3	3	–	Below the standard
EC, dS·m^{-1}	0.57	0.7	0.7	0.7	–	Below the standard
Nematode	>1	1	1	1	–	Below the standard

Table 6
Comparison of effluent parameters with international standards for 2017

Parameter	Average	WHO	EPA	FAO	IRNDOE	Comparison
BOD_5, mg·L^{-1}	147.69	–	30	–	100	Above the standard
COD, mg·L^{-1}	235	–	120	–	200	Above the standard
DO, mg·L^{-1}	1.76	–	–	–	2	Below the standard
pH	8.01	6–8.4	6.5–8.4	6.5–8	6–8.5	As standard
TSS, mg·L^{-1}	130.71	–	5	–	100	Above the standard
TDS, mg·L^{-1}	500	450	–	450	–	Above the standard
TKN, mg·L^{-1}	87.5	–	–	–	–	–
Ammoniac, mg·L^{-1}	8.29	–	–	–	–	–
Nitrate, mg·L^{-1}	22.18	5	30	5	–	Below the standard
Nitrite, mg·L^{-1}	0.78	–	1	–	–	Below the standard
TP, mg·L^{-1}	2.34	–	–	–	–	–
TColiform, mg·L^{-1}	1,800	1,000	1,000	1,000	1,000	Above the standard
SAR, (me·L^{-1})$^{0.5}$	1	3	3	3	–	Below the standard
EC, dS·m^{-1}	0.6	0.7	0.7	0.7	–	Below the standard
Nematode	>1	1	1	1	–	Below the standard

2.5 criteria. Table 13 presents the results of prioritization and how to prioritize.

The Quantitative Strategic Planning Matrix (QSPM) is a tool for analyzing scenarios and selecting the best scenario for implementing the strategy in SWOT model analysis. This matrix is in fact one of the methods and techniques of evaluation, monitoring and methods to achieve the strategy with the highest priority obtained from the SWOT model. According to the results of the effect of each of the internal and external factors on the selected strategies and the sum of the scores obtained from each column, the final score of each of the strategies was obtained. Then, this final score obtained from each of the tables of internal and external factors in Table 13 was added together and based on the final number obtained from this sum, the ranking of each strategy was determined, which results in the priority of selected strategies as follows:

SO1 – Creating optimal conditions for the use of effluent due to the presence of nutrients and minerals in it;

SO2 – Due to the effect of effluent on soil fertility and increase agricultural productivity will cause employment and reverse migration to villages;

SO3 – Use of effluent for urban green space due to nutrients and minerals and no unpleasant odor;

SO4 – Use of effluents in industry due to reasonable prices and the absence of heavy metals and damage to industrial equipment;

SO5 – Due to the climatic conditions of the region, use in desert greening of the region;

Table 7
Comparison of effluent parameters with international standards for 2018

Parameter	Average	WHO	EPA	FAO	IRNDOE	Comparison
BOD_5, mg·L^{-1}	170	–	30	–	100	Above the standard
COD, mg·L^{-1}	248	–	120	–	200	Above the standard
DO, mg·L^{-1}	1.76	–	–	–	2	Below the standard
pH	8.06	6–8.4	6.5–8.4	6.5–8	6–8.5	As standard
TSS, mg·L^{-1}	141.75	–	5	–	100	Above the standard
TDS, mg·L^{-1}	470	450	–	450	–	Above the standard
TKN, mg·L^{-1}	92	–	–	–	–	–
Ammoniac, mg·L^{-1}	8.45	–	–	–	–	–
Nitrate, mg·L^{-1}	21.5	5	30	5	–	Below the standard
Nitrite, mg·L^{-1}	0.65	–	1	–	–	Below the standard
TP, mg·L^{-1}	2.35	–	–	–	–	–
TColiform, No. at 100 mL	2,000	1,000	1,000	1,000	1,000	Above the standard
SAR, (me·L^{-1})$^{0.5}$	1.44	3	3	3	–	Below the standard
EC, dS·m^{-1}	0.59	0.7	0.7	0.7	–	Below the standard
Nematode	1	1	1	1	–	As standard

Dashed tables mean that some parameters have no limits in any of the standards.

Table 8
Matrix of internal factors and final points

Factors	Attraction coefficient	Point	Final weight
Strengths			
S1	0.07	2	0.14
S2	0.04	2	0.08
S3	0.04	3	0.12
S4	0.04	3	0.12
S5	0.05	4	0.2
S6	0.04	3	0.12
S7	0.06	2	0.12
S8	0.07	4	0.28
S9	0.06	3	0.18
S10	0.03	1	0.03
Weaknesses			
W1	0.03	4	0.12
W2	0.03	3	0.09
W3	0.06	3	0.18
W4	0.06	3	0.18
W5	0.04	1	0.04
W6	0.07	1	0.07
W7	0.06	3	0.18
W8	0.04	3	0.12
W9	0.07	2	0.14
W10	0.03	3	0.09
Total	1		2.56

Table 9
Matrix of external factors and final points

Factors	Attraction coefficient	Point	Final weight
Opportunities			
O1	0.03	3	0.09
O2	0.06	4	0.24
O3	0.08	4	0.32
O4	0.07	3	0.21
O5	0.04	3	0.12
O6	0.04	3	0.12
O7	0.05	4	0.2
O8	0.03	4	0.03
O9	0.05	1	0.02
O10	0.03	1	0.03
Threats			
T1	0.05	1	0.05
T2	0.07	1	0.07
T3	0.06	3	0.18
T4	0.05	3	0.015
T5	0.06	1	0.06
T6	0.03	3	0.09
T7	0.04	4	0.16
T8	0.06	3	0.18
T9	0.06	3	0.18
T10	0.04	3	0.12
Total	1		2.65

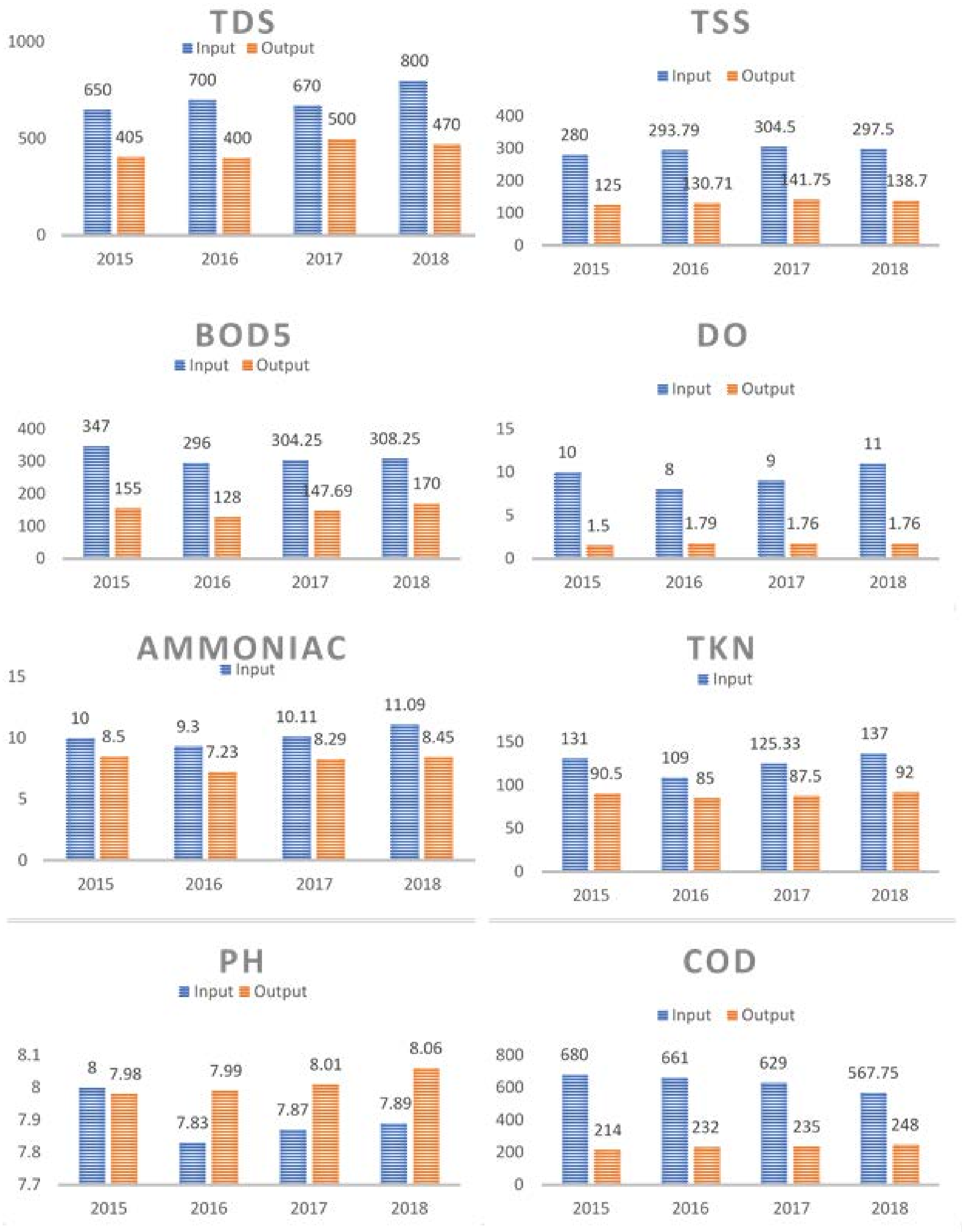

Fig. 2. Comparison of overall changes in the values of the effluent parameters in the entire statistical period.

SO6 – Due to the presence of nutrients, the use of effluent in aquaculture;

SO7 – Due to the appropriate quality conditions of the effluent, use of effluent for replacement with wells and aqueducts in the area;

SO8 – Due to the Support of farmers in the use of wastewater, creating a proper culture of using wastewater.

5. Results

The use of effluents in agriculture for economic development purposes will only be feasible if the long-term protection and conservation of resources as well as the preservation of health are considered. Examining the challenges associated with the use of wastewater in agriculture shows that many of these challenges could be solved with proper planning and the application of proper management methods. In such methods, the integrated control system uses a set of different methods to prevent, reduce and compensate for environmental and health risks, which results in cost reduction, no need for strict standards and ensuring the success of planning. first, according to the appropriate standards and guidelines and the use of optimal treatment methods, and then the appropriate patterns and type of cultivation and appropriate planting and irrigation methods and apply the necessary methods to limit contact and exposure to workers and the public and development instructions. Necessary requirements for various relevant groups such as farmers and controlling executive agents and establish and finally implement accurate and efficient monitoring systems on a monthly and annual basis to manage the use of effluent of treatment plant.

To accurately determine the investigated parameters, it is necessary to first determine the source of the effluent, which may be surface water, agricultural uses, or absorption wells. The results of the physical, chemical and microbial parameters of the wastewater treatment plant of Sabzevar City are presented in Tables 4–7 based on the guidelines provided in the standard of the Iran Environmental Protection Organization, the amount of chemical and biochemical oxygen demand parameters, and the concentration of nitrate, nitrite, Soluble and suspended matter, alkalinity was within the permissible limits recommended for the use of wastewater in the irrigation of fodder crops; according to the results of the present study, the chemical conditions of the effluent are within the permissible range and the results of the research are consistent with previous studies on the Sabzevar municipal wastewater treatment plant [27–29].

In order to better understand the annual changes of the parameters, bar graphs were used, which are presented in Figs. 2 and 3 as can be seen from the graphs, according to the treatments carried out in the treatment plant, the harmful values of the parameters have been significantly reduced and in such a way that they are often within the range of standards and recommended guidelines. In Tables 4–7 all the parameters and their changes in a statistical year are presented, which seems to have been a good match for the parameters leaving the treatment plant (although the values of several parameters were higher than the standard range, but these values were not extreme and by making decisions

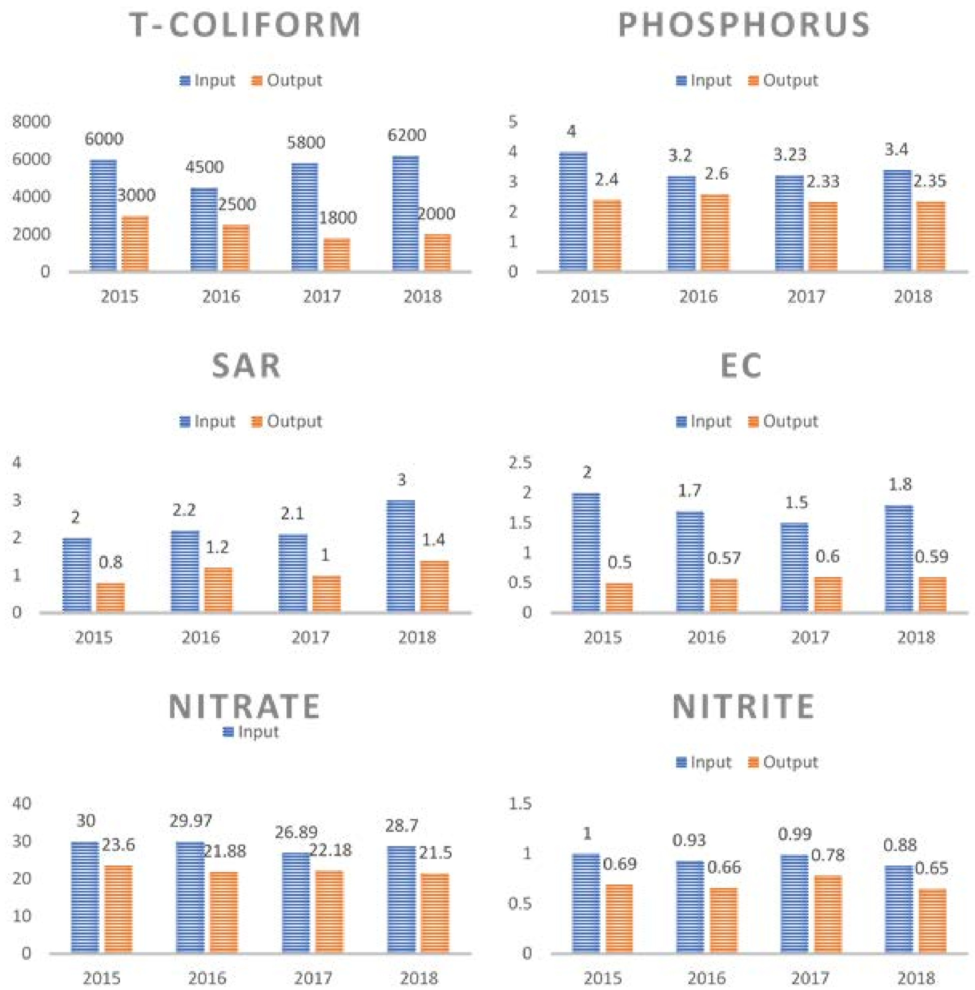

Fig. 3. Comparison of overall changes in the values of the effluent parameters in the entire statistical period.

and a more detailed examination can bring these values closer and closer to the range of standards).

The wastewater from the Sabzevar treatment plant is used for the irrigation of desertification projects in the region, therefore, due to the large amount of coliforms and not being suitable for use in agriculture and fodder irrigation, the effluent can be used to irrigate salt-tolerant desert species, especially the *Haloxylon* species, and in the projects Next, it was used for plant cultivation considering the desert nature of the area, that the use of wastewater in the

Table 10
Presenting strategies in the form of a table (matrix) to better display and understand the strategies

	Opportunities	Threats
Strengths	Offensive strategy (SO)	Competitive strategy (ST)
	SO1 – Creating optimal conditions for the use of effluent due to the presence of nutrients and minerals in it.	ST1 – Due to the quality of the effluent, coordination between different organs for the optimal use of this unconventional source.
	SO2 – Due to the effect of effluent on soil fertility and increase agricultural productivity will cause employment and reverse migration to villages.	ST2 – Due to the predictable environmental problems in the use of effluent, management this issue by conducting periodic and expert visits.
	SO3 – Use of effluent for urban green space due to nutrients and minerals and no unpleasant odor.	ST3 – Due to the suitable topographic conditions, solving the problems of effluent transfer and creating transfer channels.
	SO4 – Use of effluents in industry due to reasonable prices and the absence of heavy metals and damage to industrial equipment.	ST4 – Due to the lack of optimal conditions for using effluent to attract investors to solve this problem.
	SO5 – Due to the climatic conditions of the region, use in desert greening of the region.	ST5 – Due to the issue of land acquisition to locate the pipe or transmission channel, attracting investors to resolve this issue.
	SO6 – Due to the presence of nutrients, the use of effluent in aquaculture.	ST6 – Due to the widespread use of wastewater, further studies and expertise on this issue for localization in the region.
	SO7 – Due to the appropriate quality conditions of the effluent, use of effluent for replacement with wells and aqueducts in the area.	ST7 – Attracting investors to create infrastructure for wastewater use in aquaculture.
	SO8 – Due to the Support of farmers in the use of wastewater, creating a proper culture of using wastewater.	ST8 – Due to the Support of farmers, manage health issues effluent using accordance to international standards and guidelines.
Weaknesses	Adaptive or conservative strategy (WO)	Defensive strategy (WT)
	WO1 – According to the Support of farmers and government departments, management and justification and solving religious and jurisprudential issues in the use of wastewater.	WT1 – Use of appropriate disinfectants to remove harmful effluents.
	WO2 – Due to the limited range of plants that can be cultivated with effluent in the region, creating suitable and optimal conditions for effluent quality.	WT2 – More studies and expertise to use wastewater with regard to environmental and health issues.
	WO3 – Due to health issues resulting from the use of effluent and replacement expertise with water from aqueducts and wells.	WT3 – Due to the possibility of effluent infiltration into the aquifer, management of environmental issues.
	WO4 – Due to health issues, the use of wastewater in the industry and expertise of this issue.	WT4-According to the prediction of disease in plants, conducting expert research and studies in this field
	WO5 – Due to the psychological effects of wastewater use, culture of wastewater use in local people by holding orientation classes by relevant agencies.	
	WO6 – Due to the Support of government and non-governmental companies, the establishment of the necessary facilities at the wastewater distribution site.	

Table 11
Creating a QSPM matrix of internal factors to estimate the scores of strategies

Factors		SO1		SO2		SO3		SO4		SO5		SO6		SO7		SO8	
	Attraction coefficient	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight
Strengths																	
S1	0.07	4	0.28	3.5	0.245	4	0.28	1	0.07	3.5	0.245	4	0.28	3.5	0.245	3.5	0.245
S2	0.04	2.5	0.1	2.5	0.1	2.5	0.1	1	0.04	4	0.16	3.5	0.14	3.5	0.14	3	0.12
S3	0.04	3	0.12	3.5	0.14	2.5	0.1	3.5	0.14	3.5	0.14	4	0.16	3	0.12	2.5	0.1
S4	0.04	3.5	0.14	4	0.16	4	0.16	1.5	0.06	3.5	0.14	2.5	0.14	3.5	0.14	2	0.08
S5	0.05	4	0.2	4	0.2	3.5	0.175	1.5	0.075	3.5	0.175	3	0.15	3	0.15	3.5	0.175
S6	0.04	2	0.12	2.5	0.1	2.5	0.1	2.5	0.1	4	0.16	2.5	0.1	2.5	0.1	2.5	0.1
S7	0.06	3.5	0.105	3	0.18	3.5	0.21	1.5	0.09	3.5	0.21	2	0.12	3.5	0.21	2	0.12
S8	0.07	4	0.28	4	0.28	3.5	0.245	3.5	0.245	3.5	0.245	3.5	0.245	4	0.28	3.5	0.245
S9	0.06	3	0.18	3.5	0.21	2	0.12	1.5	0.09	2	0.12	2	0.12	3.5	0.21	4	0.24
S10	0.03	2.5	0.075	2	0.06	2.5	0.075	2	0.06	2	0.06	2	0.06	2	0.06	1.5	0.045
Weaknesses																	
W1	0.03	1.5	0.045	2	0.06	1.5	0.045	3	0.09	1	0.03	3	0.09	2	0.06	1.5	0.045
W2	0.03	2	0.06	3	0.09	3	0.09	2.5	0.075	3	0.09	1	0.03	2	0.06	2	0.06
W3	0.06	1.5	0.09	1	0.06	4	0.24	4	0.24	1	0.06	3	0.18	1.5	0.09	1	0.06
W4	0.06	2	0.12	2	0.12	3	0.18	2.5	0.15	1	0.06	1	0.06	2.5	0.15	1.5	0.15
W5	0.04	2.5	0.1	2.5	0.1	3.5	0.14	2.5	0.1	2.5	0.1	3.5	0.14	3	0.12	2	0.08
W6	0.07	3	0.21	1.5	0.105	3	0.21	1	0.07	1.5	0.105	2	0.14	1.5	0.105	2	0.14
W7	0.06	2	0.12	2.5	0.15	2	0.12	4	0.24	1.5	0.15	3	0.18	2.5	0.15	2	0.12
W8	0.04	1.5	0.06	1.5	0.06	3.5	0.14	4	0.16	2.5	0.1	1	0.04	1.5	0.06	1.5	0.06
W9	0.07	2	0.14	2	0.14	2.5	0.175	1	0.07	1.5	0.105	1.5	0.105	1.5	0.105	1.5	0.105
W10	0.03	2.5	0.075	2.5	0.075	3	0.09	3	0.09	1.5	0.045	1.5	0.045	1.5	0.045	1.5	0.045
Total	1		2.62		2.635		2.995		2.255		2.5		2.485		2.6		2.415

Table 12
Creating a QSPM matrix of external factors to estimate the scores of strategies

Factors	Attraction coefficient	SO1		SO2		SO3		SO4		SO5		SO6		SO7		SO8	
		Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight	Point	Weight
Opportunities																	
O1	0.03	4	0.12	3	0.09	3.5	0.105	4	0.12	4	0.12	3.5	0.105	3.5	0.105	3.5	0.105
O2	0.06	3.5	0.21	3.5	0.21	2	0.12	4	0.24	3.5	0.21	3.5	0.21	3	0.18	3	0.18
O3	0.08	3.5	0.28	4	0.32	2	0.16	3.5	0.28	3.5	0.28	3.5	0.28	3.5	0.28	3.5	0.28
O4	0.07	3.5	0.245	4	0.28	2	0.14	3	0.21	2.5	0.175	3.5	0.245	3	0.21	3.5	0.245
O5	0.04	1.5	0.06	3	0.12	1	0.04	4	0.16	3.5	0.14	1	0.04	3.5	0.14	3	0.12
O6	0.04	2.5	0.1	3	0.12	1	0.04	1	0.04	2	0.08	4	0.16	3.5	0.14	3.5	0.14
O7	0.05	2.5	0.125	2.5	0.125	3	0.15	2	0.1	3.5	0.175	3.5	0.175	3	0.175	4	0.2
O8	0.03	2.5	0.075	2.5	0.075	3.5	0.105	3	0.09	3.5	0.105	2	0.06	3	0.09	2	0.06
O9	0.05	3.5	0.175	2	0.1	3.5	0.175	3.5	0.175	3.5	0.175	3.5	0.175	4	0.2	3	0.15
O10	0.03	3.5	0.075	2	0.06	3	0.09	2	0.06	2	0.12	2	0.12	2	0.12	2.5	0.075
Threats																	
T1	0.05	2	0.1	2	0.1	3	0.15	2	0.1	2	0.1	3	0.15	1.5	0.075	1	0.05
T2	0.07	1.5	0.105	1.5	0.105	2	0.14	3	0.21	3	0.21	1	0.07	1.5	0.105	3	0.21
T3	0.06	2	0.12	2	0.12	3	0.18	2	0.12	1	0.03	2.5	0.15	3	0.18	3.5	0.21
T4	0.05	3.5	0.175	3.5	0.175	1	0.05	4	0.2	3	0.15	3	0.15	2.5	0.125	3.5	0.175
T5	0.06	2	0.12	2	0.12	3	0.18	3.5	0.21	2	0.12	3	0.18	2	0.12	2.5	0.15
T6	0.03	3	0.09	2	0.06	2	0.06	1	0.03	2	0.06	1	0.03	1.5	0.045	1	0.03
T7	0.04	1.5	0.06	1.5	0.03	2	0.08	1	0.04	2	0.08	1	0.04	1.5	0.06	1	0.04
T8	0.06	1.5	0.09	1.5	0.09	3	0.18	2	0.12	1	0.06	3.5	0.21	2.5	0.15	3	0.18
T9	0.06	3	0.18	3	0.18	3	0.18	3	0.18	1	0.06	4	0.03	2	0.12	3	0.18
T10	0.04	3	0.12	3	0.12	3	0.12	1	0.04	1	0.04	2	0.08	1.5	0.06	2	0.08
Total	1		2.920		2.952		2.445		2.725		2.520		2.69		2.68		2.68

Table 13
Prioritization of selected strategies

Strategies	SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8
Internal	2.62	2.635	2.995	2.255	2.5	2.485	2.6	2.68
External	2.920	2.952	2.445	2.725	2.52	2.69	2.68	2.415
Total	5.54	5.587	5.44	4.98	5.02	5.175	5.28	5.095
Sort	2	1	3	8	7	5	4	6

sustainability of plants, reducing the costs of irrigation and fertilization and the biological restoration of desert areas by the species They have seen suitable *N. schoberi* is matches.

At the time of drying up of the river, it is suggested to reduce the environmental effects of the effluent along the Kalshor river route, to use the effluents to produce wood products on the Kalshor border. This work provides both the ground for reducing the pollution of underground water, soil, and wildlife, as well as the ground for job creation and income generation.

In Table 10 from the matrix of internal and external factors, four strategies are obtained and then depending on whether the amount of internal and external factors is greater or less than 2.5, which in this study were both greater than 2.5 (Tables 8 and 9), offensive strategies were selected as the selected strategy and then in Table 11 each of the selected strategies against internal factors and in Table 12 against external factors and the effect of each of these factors in determining and achieving That strategy was measured and then, depending on these factors, a final score or value was obtained for each of the strategies. The selected strategies, in addition to the internal strengths of the treatment plant effluent (which is in good range with national and international standards) have the potential opportunity of the region to use the effluent and based on the obtained priorities solutions should be sought Sabzevar municipal wastewater treatment and use of its effluent, in addition to rehabilitating desert areas and green space, was for agriculture of the dominant plants of the region such as wheat and barley, sugar beet and vegetables and summer crops. Also, considering that public opinion on the use of wastewater is somewhat negative, we should seek to create a positive culture by holding events in village councils and the people of the villages.

References

[1] I. Aalton, Degradation of a commercial textile biocide with advanced oxidation processes and ozone, J. Environ. Manage., 82 (2006) 145–154.
[2] S. Arzate, S. Pfister, C. Oberschelp, J.A. Sánchez-Pérez, Environmental impacts of an advanced oxidation process as tertiary treatment in a wastewater treatment plant, Sci. Total Environ., 694 (2019) 133572, doi: 10.1016/j.scitotenv.2019.07.378.
[3] R. Saliba, R. Callieris, D. D'Agostino, R. Roma, A. Scardigno, Stakeholders' attitude towards the reuse of treated wastewater for irrigation in Mediterranean agriculture, Agric. Water Manage., 204 (2018) 60–68.
[4] World Bank, Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa, MENA Development Report, Washington, D.C., 2007.
[5] S. Dolnicar, A. Hurlimann, L.D. Nghiem, The effect of information on public acceptance − the case of water from alternative sources, J. Environ. Manage., 91 (2010) 1288–1293.
[6] A. Hurlimann, S. Dolnicar, When public opposition defeats alternative water projects − the case of Toowoomba Australia, Water Res., 44 (2010) 287–297.
[7] X. Garcia, D. Pargament, Reusing wastewater to cope with water scarcity: economic, social and environmental considerations for decision-making, Resour. Conserv. Recycl., 101 (2015) 154–166.
[8] A. Kontogianni, I.H. Langford, A. Papandreou, M.S. Skourtos, Social preferences for improving water quality: an economic analysis of benefits from wastewater treatment, Water Resour. Manage., 17 (2003) 317–336.
[9] M.L. Gatto D'Andrea, A.G.J. Salas Barboza, S.V. Garces, M.S. Rodriguez Alvarez, M.A. Iribarnegaray, V.I. Liberal, G.E. Fasciolo, J.B. van Lier, L. Seghezzo, The use of (treated) domestic wastewater for irrigation: current situation and future challenges, Int. J. Water Wastewater Treat., 1 (2015), doi: 10.16966/ijwwwt.107.
[10] A. Hurlimann, J. McKay, Urban Australians using recycled water for domestic non-potable use: an evaluation of the attributes price, saltiness, colour and odour using conjoint analysis, J. Environ. Manage., 83 (2007) 93–104.
[11] M.K. Kiriaki, K.P. Tsagarakis, Public participation in designing a recycling scheme towards maximum public acceptance, Resour. Conserv. Recycl., 70 (2013) 55–67.
[12] H. Rezaei, S. Sa'adat, Wastewater reuse in agriculture: opportunities, challenges, and solutions, J. Land Manage. (Soil Water Sci.), 6 (2018) 213–231 (in Persian).
[13] K. Khaskhoussy, B. Kahlaui, E. Misle, M. Hachicha, Accumulation of trace elements by corn (*Zea mays*) under irrigation with treated wastewater using different irrigation methods, Ecotoxicol. Environ. Saf., 170 (2019) 530–537.
[14] H. Abya, M. Nasiri, M. Ebrahimi, A. Movahed, Strategic planning for tourism industry using SWOT and QSPG, Manage. Sci. Lett., 5 (2015) 295–300.
[15] S. Subramoniam, S. Ali Naser, A. Mohammed, SWOT analysis on Oman tourism: a case study, J. Econ. Dev. Manage. IT Finance Market, 2 (2010) 1–22.
[16] E. Bernroider, Factors in SWOT analysis applied to micro, small-to- medium, and large software enterprises: an Austrian study, Eur. Manage. J., 20 (2002) 562–573.
[17] R. Bahrami, Review the Capabilities and Bottlenecks of Rural Tourism Development in Kurdestan Province, Article Collection of 4th Geographers' International Congress of the Islamic World, (ICIWG, 2010), Iran, Zahedan, 2010 (in Persian).
[18] R.G. Dyson, Strategic development and SWOT analysis at the University of Warwick, Eur. J. Oper. Res., 152 (2004) 531–540.
[19] A. Farzi, J. MehrAbadi, Systematic analysis of strengths, weaknesses, opportunities and threats of on-site greywater reuse in Iran based on fuzzy analytical hierarchy process, Iran Water Res. Res., 15 (2020) 328–339 (in Persian).
[20] Sabzevar Water and Sewerage Company and Kavosh Pay Consulting Engineering Company, Sabzevar, Statistics and information of Sabzevar Wastewater Treatment Plant, Sabzevar Wastewater Treatment System Extension Magazine, 2011 (in Persian).
[21] M. Arabi, The Handbook of Strategic Planning, 4th ed., Office of Cultural Research, Tehran, 2010 (in Persian).
[22] A. Zarrabi, M.R. Mahboobfar, Application of SWOT-QSPM model in developing tourism development strategy of Kashan, J. Spat. Plan. (Geography), 3 (2014) 37–58 (in Persian).
[23] H. Almasi, M.S. Doorfard, Developing the country's tourism strategy based on SWOT matrix analysis (Case Study of Tehran Cultural Heritage and Tourism Organization), J. Tour. Dev., 1 (2012) 97–121 (in Persian).
[24] M. Earabi, A. Parsaeian, Strategic Management, Cultural Research Office, 2000 (in Persian).
[25] A. AliAhmadi, I. Tajoddin, M. Fathollah, Comprehensive Approach to Strategic Management, The Production of Knowledge Press, 2010 (in Persian).
[26] A. Kurdnaeij, Strategic Thinking and Management, 1st ed., Tarbiat Modarres University Publishers, 2017 (in Persian).

[27] A. Vali, H. Bor Abadi, Determining the cultivation pattern and evaluating the cultivated species with treated municipal effluent for rehabilitation of desert lands, Geogr. Stud. Arid Reg., 7 (2017) 37–47 (in Persian).
[28] R. Arefkhani, A. Rashidi Mehrabadi, Status and Performance of Sabzevar Wastewater Treatment Plant During 2008–2009, 5th National Conference on Environmental Engineering (CEE05_497), Tehran, 2011 (in Persian).
[29] H. Riazi, A. Nejatipour, S.A. Shayeghi, A. Sharafi, Evaluation of the Efficiency of Sabzevar Wastewater Treatment Plant in Oil and Fat Removal, 2nd Iranian Congress of Water and Wastewater Science and Engineering (NWWCE02_052), Isfahan, 2019 (in Persian).
[30] S.A. Nourbakhsh, H. Hassanpour Darvishi, H. Ebrahimi, Analysis of domestic wastewater recycling methods for agricultural and irrigation uses using combined SWOT-QSPM model, case study: Sabzevar City Treatment Plant, Iran-Water Resour. Res., 18 (2022) 1–17 (in Persian).