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ORIGINAL ARTICLE

Water source planning in arid zones using low impact development (lid) approach (case study: The Basin of Salt Lake and Central Desert, Iran)

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Water is literally the stuff of life. A clear understanding of present and future sources of water and of strategies for the effective management of water resources is in the interest of every country. The challenge is urgent because human population demands, as well as climate change, make once secure sources uncertain. Moreover, water projects are often large and expensive and take many years to complete, so future planning is crucial. For any one person, the ecological environment is very important, it can provide for human survival and development of material basis and the necessary variety of other conditions. Inappropriate if the ecological environment, human beings can not survive and develop. We can say that human existence and development, are dependent on a suitable environment. One element of singularity of place that remains is time (and history) manifest through architecture and the constructed environment. Two views of both cities-cross-sectional and plan-reveal very different urban morphologies. The theory is that if the pre-development distribution of in-stream flows is maintained, then the baseline capacity to transport sediment, a proxy for the geomorphic condition, will be maintained as well. A popular method of mimicking the pre-development flow regime is via flow duration control (FDC). As it turns out, storage requirements for flow duration control tend to be much larger than that for surface water treatment requirements, particularly when the storm water facilities are small, distributed facilities with simple outlet structures, such as those designed for Low Impact Development (LID) Low-impact development (LID) methods can cost less to install, have lower operations and maintenance (O&M) costs, and provide more cost-effective storm water management and water-quality services than conventional storm water controls. LID also provides ecosystem services and associated economic benefits that conventional storm water controls do not.
Keywords: Spatial strategic planning; low impact development (lid); water sensitive city; environmental sustainability; The Basin of the Salt Lake and Central Desert of Iran

Introduction

Water is literally the stuff of life. It is absolutely essential for human health, for food production and for sanitation as well as for a host of other uses. A clear understanding of present and future sources of water and of strategies for the effective management of water resources is in the interest of every country. The challenge is urgent because human population demands, as well as climate change, make once secure sources uncertain. Moreover, water projects are often large and expensive and take many years to complete, so future planning is crucial. For any one person, the ecological environment is very important, it can provide for human survival and development of material basis and the necessary variety of other conditions. Inappropriate if the ecological environment, human beings can't survive and develop. We can say that human existence and development, are dependent on a suitable environment. One element of singularity of place that remains is time (and history) manifest through architecture and the constructed environment. Two views of both cities—cross-sectional and plan—reveal very different urban morphologies.
Development planning for water resources is a dynamic and effective policy for creating necessary facilities to use water resources. For many years, major attention have been paid to water resources, environmental issues, political, legal and

organizational development. Today, factors such as significant increase in world's population and indiscriminate exploitation of environmental resources, economic needs security, can put impacts on their relations to water resources, which has created issues such as water sensitive cities. Water resources has formed one of the biggest challenges of the century. On the one hand, with the depletion of healthy ground water and surface resources, and on the other hand by the arrival of municipal and industrial wastewater and polluted runoffs to these resources are threated so serious. Iran is among the countries with annual average rainfall of 250 mm, compared to global average of 750 mm annual rainfall, and is considered among arid and semi-arid countries. Deficit reduction of water shortage and level reduction of fresh and healthy water as well as importance of protection against existing pollution and currently increasing faced with the urgent need. In this context: in the basin of the Salt Lake and the Central Desert of Iran with approximately 150 ml rainy، this area is need more water to achieve its development planning goals. This can't be achieved due to water shortage that is facing the country and especially the region and its surrounding villages and cities. Lack of standard sewage system and runoff city causes direct entry of sewage and runoff city into the rivers. Also, rather than 30% water of pipes in water distribution network of the city, and according to the municipal pipes exhaustion due to the recent growing water crisis and the rise of farming and gardening lands around cities that caused these factors, have been reduced of groundwater. The necessity and importance of planning for some period of time to reveal the city of The Basin of Salt Lake and Central Desert in terms of water management.Considering that low-impact development methods are one of the methods of runoff management to maintain or restore the natural conditions of a catchment area and improve the environment in that basin, the purpose of this study is to help with this strategic approach to the planning of water resources appropriate to the environmental potential And a low-impact development approach to prevent the continuation of the critical water supply situation. Given the challenges posed, the present research seeks to identify: water planning of hot and dry areas with the help of a low-impact development approach in the catchment area of the salt lake and the central desert? What are the solutions to improve the situation in these areas?

A lot of research has been done on low-impact development methods that can be found in the studies of Hifeng et al., Christopher et al., Spi et al., and Kavianpour et al. In 2009, Gillari et al. Reviewed two types of low-impact development in two situations. How little development is affected in a small basin on how effective they are (Kavianpour et al., 2010). In 2007, Puddephatt & Heslop reviewed low-impact development methods for flood management with rainfall change in climate change scenarios. In their study, the effect of low impact development on variable run rainfall on surface runoff concluded that low developmental efficiency was affected by varying rainfall on surface runoff and concluded that low developmental efficiency was affected by different rainfall in different ways. (NHAB, 2003). In a 2007 article, Franco et al. Reviewed the cost of implementing low-impact development strategies without taking into account other environmental benefits to reduce urban runoff. This paper is a simple example for evaluating costly and profitable investment in low-impact development to reduce flooding floods in urban sewage (Nouri, 2010). Kavianpour et al. (2010) in an article exploring river interactions and development methods Low-impact urban areas in Tehran, and concluded that the implementation of low-impact development methods could reduce the input runoff volume by 39% and reduce the inflow into the river by 68% in some scenarios. (Van Roon et al. 2009). However, there is a group of people who believe that in some arid areas it may be necessary to irrigate during long dry periods (AHBL, 2013). In these areas, particular attention should be paid to plant selection and maintenance; although some planners are not only efficient and flexible in the feasibility of using techniques, but also water resources (The practice of Low Impact Development , 2003). Usually There is little knowledge in the design, construction, capital and maintenance of low development techniques and their performance in dry climates (Zakeri et al., 2011). It is better to use methods of retention and reuse in low rainfall regions with warmer and longer seasons and can be treated according to the quality of water needed (Kennedy, 2007). By spending time and using modern and dynamic management practices, To overcome this vital issue has become global (Momeni and Momeni, 2014).

Materials and methods of research

Experiments on determination of the bio-agent effect on the total yield of the tomatillo varieties Likhtaryk and Ananasovyi were carried out at the research site of the Department of Landscape Gardening, Horticulture and Viticulture at Vinnytsia National Agrarian University in 2016-2017. Seedlings were grown under conditions of the film greenhouse ZIMET according to guidelines of the Institute of Vegetable and Melon Growing of NAAS for the solanaceous plants. Seedlings were planted in the open ground according to the scheme of 70 × 35 cm in the second decade of May. In the course of vegetation, the tomatillo plants were treated with bio-agents, namely: Humisol, Rostmoment, Azotobacterin, Biomag, Biopolycid, Phosphoretherin. Plants were sprayed 5 times in the following sequence: for the 1st time-in 10-12 days after pricking off, the 2nd-in 10-12 days after the first treatment, the 3rd-in 10-12 days after transplanting the seedlings to a permanent place of vegetation, the 4th and 5th-in 10-12 days after the previous application of a bio-agent. The control was the variant where bio-agents were not applied. Variants in the experiment were placed by the method of randomized blocks with a triple replication. The beginning of phases of plant growth and development was determined by the observation method; biometric measurements were made by the laboratory method, namely: plant height and stem diameter before fruit setting, fruit diameter, fruit number, fruit mass, leaf area and leaf dry matter before flowering; and the total plant yield was determined by the mathematical analysis. Leaf area was determined by the methods of Bondarenko H.L., Yakovenko K.I., et al. dry matter content-by the method of Parshykova T. V., et al. crop recording was conducted in accordance with the guidelines of Bolotskykh O.S. et al.

Study area and data-set

The two basins of the salt lake and central desert, which are located between the geographical coordinates of 08 48 to 30 52 east longitude and 33 333 to 22 36 north latitudes, include all or part of the provinces of Tehran, Isfahan, Central, Zanjan, Qazvin, Qom and Hamedan, Khorasan Razavi, North Khorasan, Semnan Rial, Yazd and Golestan, which are among the largest and most densely populated basins in the country. According to reports, the annual deficit of the reservoir is about 725 and 999 million cubic meters respectively. In terms of the central desert basin and salt lake, in the first and second places, respectively, the volume of the reservoir is 30th in the country. Unfortunately, the use of sewage plans in the country has not been consistent with the development of water supply projects. At present, sanitary wastewater is disposed of in most cities and villages within the catchment area of the salt lake and the central desert through the wells. Of course, in many villages similar to basin-based cities, wastewater from the washings is separately disposed of in a separate well or transmitted to the village passes to a level. Considering that there are no plans and frameworks for monitoring of household wastewater discharges in cities and villages; this issue is considered as one of the major problems and sources of pollutants in the catchment area. In the catchment area of the salt lake, 27 wastewater treatment plants with a nominal capacity of 264 million cubic meters and a capacity of 250.4 million cubic meters per year are about 28.5 percent of the total nominal capacity of the wastewater treatment plants and 21 percent of the refined wastewater in the country. The nominal capacity of the central drainage basin wastewater treatment plants is about 64.1 million cubic meters and the capacity of exploitation is 47.3 million cubic meters per year, which is about 5.8 percent of the total nominal capacity of the existing wastewater treatment plants and 35.5 percent of the refined wastewater in the catchment area includes (Figure 1).

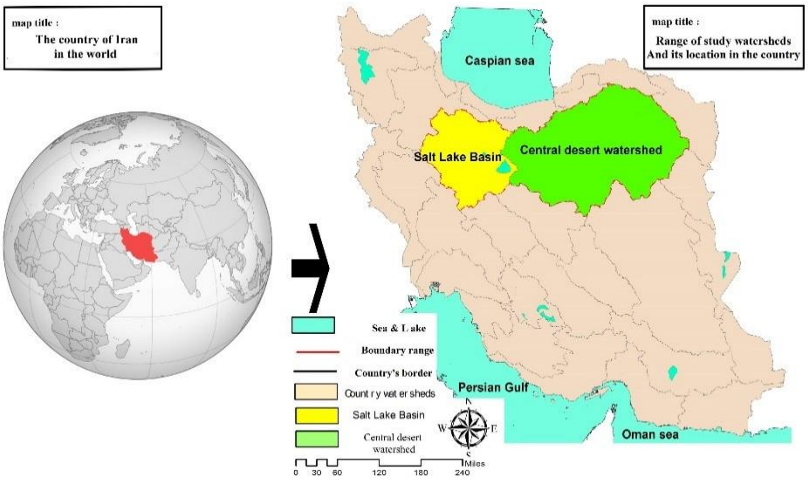

Figure 1. Overlapping the watershed of the central desert and the salt lake and determining the boundary of the catchment area with the political boundaries of the provinces (Source: Writers).

Materials and methods

The present study is of a practical nature, due to direct encounter with the sample and analysis of its changes based on existing foundations. The paradigm of the research space is also positivist, its purpose or approach is descriptive-oriented, with the help of analyzing data and information, and in terms of the research strategy, is a kind of inductive and deductive, and, as appropriate, the method is also combined; therefore, the required research data is collected and analyzed and using Quantitative and spatial methods of measured variables and finally qualitative analysis (strategy, policy, and executive actions) are expressed. Data collection through library studies, access to Latin and Farsi sources is under consideration in the subject area. Accordingly, the conceptual framework of the subject under study will be as follows according to the type of climate and the terms of the study area. In order to measure these factors, the data and information was first reviewed and completed by field study, then a software bank was created in the Excel environment. Ecological analysis and layer overlapping in ARC MAP maps from different layers to air analysis of changes in land and water resources in the years 85 to 90, and with the help of ARCGIS 10.4, the layers of each user were identified and analyzed and analyzed for further analysis. Factors influencing the environmental impacts of salt and central desert with the help of SWOT analysis method and Quantitative Strategic Planning Matrix) QSPM(method have been used to quantitatively analyze the strategies set forth in this field and have reached the final strategy and have been adapted with the help of ARC GIS space and ultimately providing solutions And executive and management suggestions. As the previous worker of this step, the inadequate location of industries in rivers, towns, and landslides of fertile lands and high-level underground water resources was identified as one of the issues. At first, activity units, factories and industrial complexes were studied in accordance with the guidelines in Categories 1 to 6 are categorized. To do this, in the Atrribute table for the shapefile of the above industries, a column with the title of the category is created and the industry category is mentioned (Table 1). Then by applying the allowed radius of industrial units in relation to the city, village, water resources, etc. in GIS software and for this purpose, for other complications such as settlements, communication networks, etc., such maps are obtained in different cases; and finally, with the help of the overlay method, the layers of various overlabs derived from the effects of the buffers give rise to an integrated map, the same ecological analysis with low environmental impact development.

Table 1: Indicator used in the research according to the adaptability to the dimensions and indicators of the low development

approach, taking into account the minimum allowable distances for the establishment of industrial and service units (Reference: Environmental Protection Agency, 2011).

Row	Places and Centers		Distance from different centers to m					
			Category 1	Category 2	Category 3	Category 4	Category 5	Category 6
1	Settlement centers	Center of province	_	500	1000	1500	2000	2500
2		City center	_	250	500	1000	1500	2000
3		City	_	200	500	1000	1500	2000
4		Rural	_	200	500	1000	1000	1500
5	Medical and educational centers		_	200	500	750	1000	1500
6	Military centers		50	200	500	750	1000	1500
7	National Park-lake		150	150	500	1000	1500	2000
8	Protected area		_	150	200	250	500	1000
9	Permanent saline river		100	100	150	150	250	500
10	Permanent drinking water		150	150	500	1000	1500	2000
11	Water wells and aqueducts		50	100	150	200	250	500

In this research, the strategies were identified with the help of SWOT. Using the Barsonian model, the strategic analysis was conducted using the QSPM method. The quantitative strategy matrix of the prioritized strategies identified the implementation plan and measures, as well as the prioritization and timing of these actions.

Results

In the catchment area of the salt lake, 42 hydrocarbons including reservoir and diversion dams with a reservoir volume of 1,175.5 million cubic meters and an adjustable volume of 1485.6 million cubic meters. The allocation status of most dams in this basin is marked. Approximately 713.5 million cubic meters, or 60.6% of the total regulated water in the basin, is devoted to drinking. The existence of metropolises of Tehran and Karaj in this basin is the main reason for the high volume of drinking water consumption in this basin. The share of other consumption sectors, including agriculture, industry and environment, is 652, 31 and 3.4 million cubic meters, respectively. The area of the dams in operation is 80191 hectares, 13151 hectares and 66606 hectares. The hydropower targets in this basin are 306 gigawatts per year. In the catchment area of the salt lake, there are 5 reservoir dams with 21345 million cubic meters and an adjustable volume of 307/2. Objectives Often, these dams are also urban drinkers, which accounts for 53.7% of the total water regulated dams in the basin. The share of agriculture and industry is 285 and 1.7 percent respectively. In the catchment area of the salt lake, 47 dam with reservoir volume and adjustable volume are 498.3 and 1.410 million cubic meters, respectively. The dams in the study of salt lake basin are often agricultural targets. As much as 91 percent of the adjustable volume of these dams is devoted to agricultural uses. With the use of centuries of studying the catchment area of the salt lake, about 60180 hectares of land are maintained or their irrigation system is improved. In general, the potential for storing and setting surface water by dams in the catchment area of the salt lake is 2621 and 2203 million cubic meters, respectively. 1112.7 million cubic meters of this volume for agricultural consumption, 889 million cubic meters of it for urban drinking, and the rest for the consumption of industry and the provision of environmental rights (Figure 2).

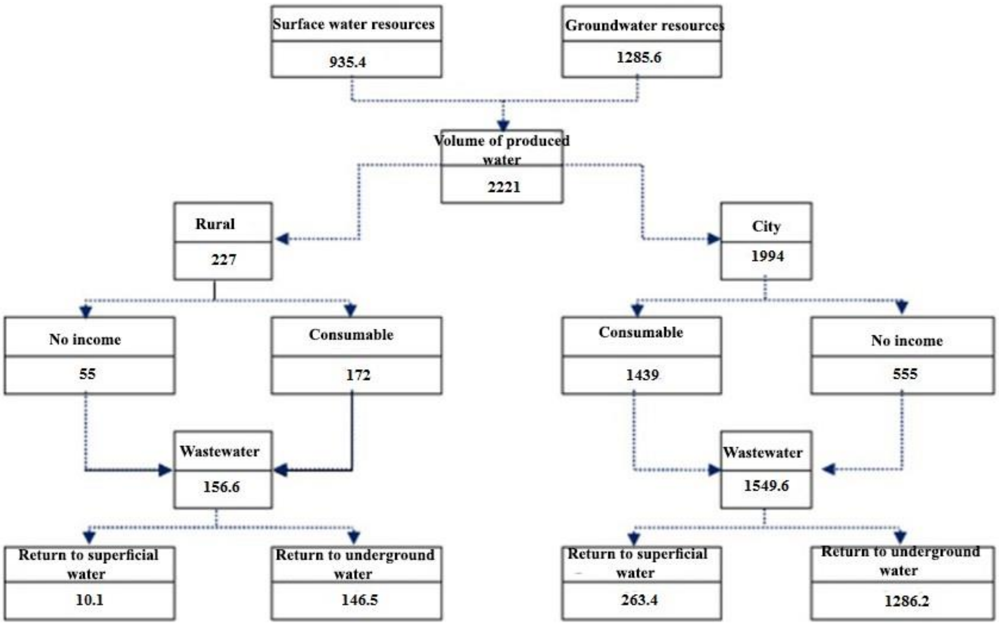

Figure 2. Schematic volume of production, consumption, effluent and reclamation water of the salt lake basin (figures per million cubic meters) (Motiee Langroudi et al., 2006).

Also in this basin there are 12 reservoir dams with a reservoir volume of 121.88 m^3 and a capacity of 70.7 m^3. The share of each sector of consumption, including agriculture, drinking, industry and environment, is 45.9, 4.9, 6.1 and 8.2 million cubic meters, respectively. In total, the number of dams in operation, implementation and study of this basin is 54, with a reservoir volume of 547 million cubic meters and a capacity of 366.4 million cubic meters. The share of each sector of consumption, including agriculture, drinking, industry and environment is 43.6, 20.4, 233.6 and 9.0 million cubic meters, respectively. Most of the dams in the central desert basin have been built with the aim of providing agricultural needs. A very few of these dams have hydro-targets, with only 16 gigawatts of electricity per year in the basin. Using all dams of the central desert, 30837 hectares of agricultural land is covered by irrigation and drainage networks of dams. Despite the vast extent of the catchment area (the widest water catchment area of the country) due to the small volume of rivers and rivers seasonality, the water resources development plans of this basin are very small in comparison with other catchment areas of the country. Most large industries of the salt lake basin are concentrated in the south and west of the province of Tehran. Accordingly, there are 188857 industrial units with water requirements equivalent to 284.78 million cubic meters. The water needs of dispersed industries are in the second and third ranks. Tehran Karaj is the main consumer of drinking water and industry. In the agricultural sector, the most important areas of importance are Qazvin, Tehran-Karaj, Arak, Saveh, Komjanjan (Figure 3).

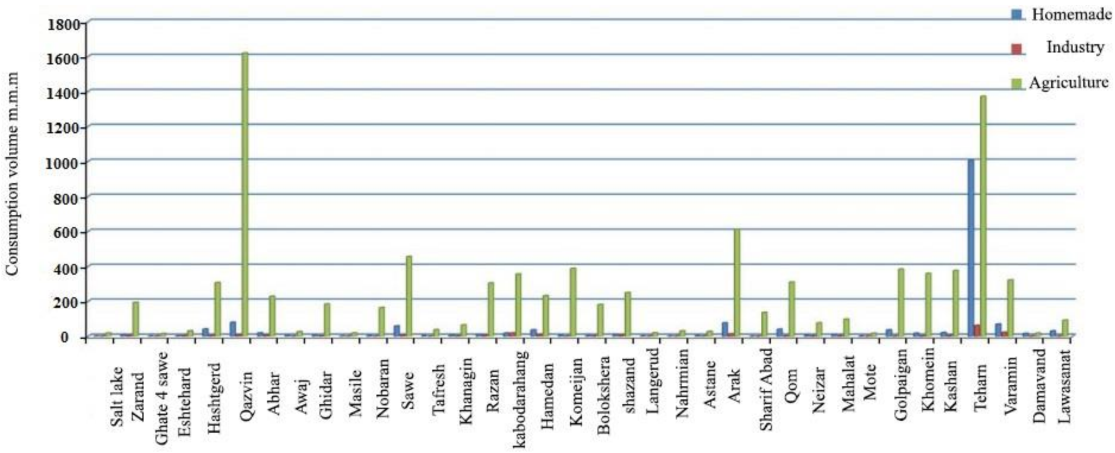

Figure 3. The volume of water consumed by each of the consumption sectors (drinking, industry and agriculture), by the study area of salt lake (Source: Iran Water Resources Management Company, 2010).

In the desert central watershed, the severe constraints on freshwater sources cause the population to disperse in the widest water catchment area of the country. Only 2713,000 inhabitants are in this basin. The amount of extraction from water resources for drinking in this basin is 0.27 billion cubic meters (4% of the country's drinking demand), with the share of urban and rural drinking being 0.17 and 0.11 billion cubic meters, respectively. A large part of the catchment area is inhabited by no population with a population density of less than one per square kilometer, and there is no big city. In the catchment area of the central canyon, by the year 1390, a total of 37 dam with a reservoir volume of 255.6 million cubic meters and a capacity for adjusting 154.86 million cubic meters has been put into operation. Of the 37 dams in this basin, 27 dams have been allocated and 10 dams have not yet been allocated. The share of each sector of consumption, including agriculture, drinking, industry, and the environment (from about 157 million cubic meters of adjustable dams) is 114.3, 6.6, 6.6, and 6.25 million cubic meters, respectively. The land under cultivation of the above mentioned dams is about 23134 hectares, of which 13405 hectares are land for development and the rest of the land improvement. There are 5 reservoir dams with adjustable water volume of 138.9 million cubic meters in central basin. The share of agricultural and industrial sectors is 103, 25.1 and 8.3 million cubic meters, respectively (Figures 4 and 5).

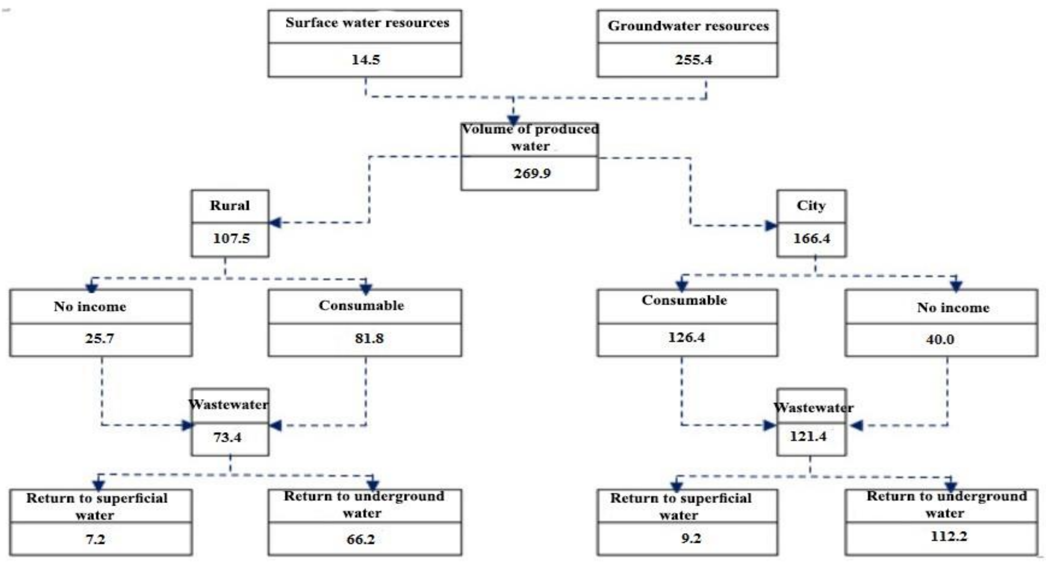

Figure 4. Schematic volume of production, consumption, effluent and reclamation of the catchment area of the central canyon (cultivars in terms of million cubic meters) (Source: Jamab, 2005; Consultant, 2010).

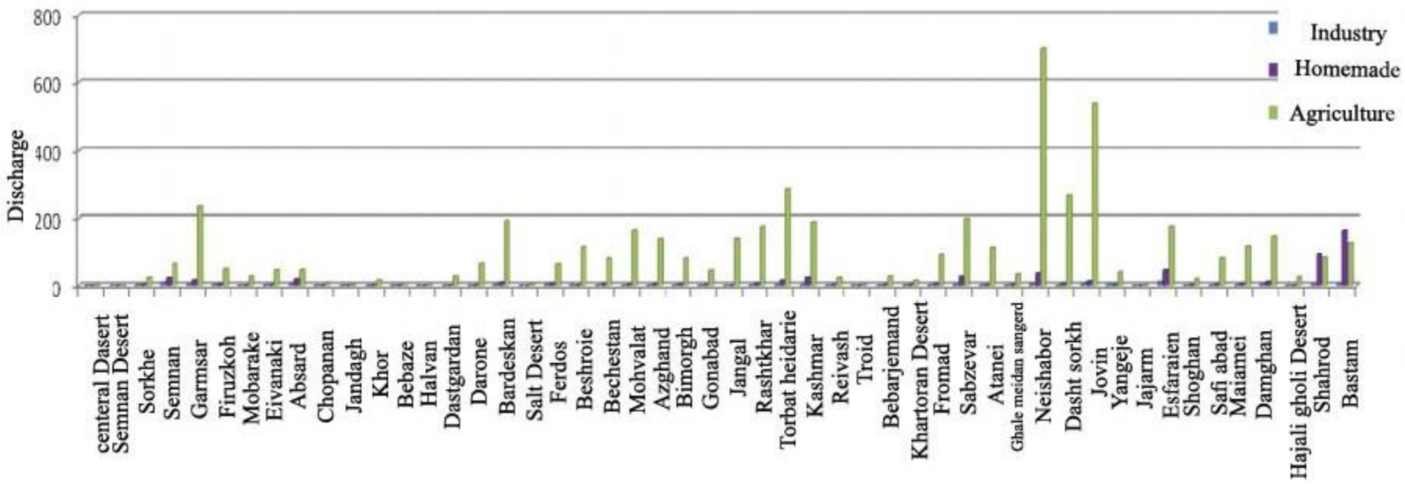

Figure 5. The volume of water consumed by each section of consumption (drinking, industry and agriculture) in terms of the central study area (Source: Iran Water Resources Management Company, 2010).

The volume of water produced for urban and rural drinking purposes is 162.4 and 107.5 million cubic meters respectively, and the total amount of water produced for drinking water in the catchment area is about 299.9 million cubic meters. 97 and 91 percent of the water produced from urban and rural drinking water is provided from groundwater resources and the rest of the surface water. The lack of suitable rivers in the catchment area has caused most drinking water to be extracted from groundwater resources. The amount of produced waste from urban and rural communities is 121.4 and 73.4 million cubic meters, respectively. 92.4% of urban wastewater and 90.2% of rural wastewater are transferred to groundwater resources and the remainder to surface water resources. The annual deficit of the central reservoir basin reservoir is about 999 million cubic meters. About 40 districts of the 50 districts of the central desert basin have a prohibition on exploitation due to the large reservoir capacity deficit. Of the 44 areas with piezometric studies, 17 areas with a reservoir capacity of more than 10 million cubic meters and 3 with a reservoir with a volume of more than 50 million cubic meters, and two areas with a reservoir with a deficit of more than 150 million cubic meters. Accordingly, the Jowin plain with a deficit of about 151 million deficits, equivalent to 16 percent of the total deficit of the central reservoir reservoirs, has the highest negative balance and then Neyshabur (deficit of 150 million cubic meters and 16 percent share), products (deficit of 76 million cubic meters and 8 percent share) And the plain of Rasht (deficit is 47 million cubic meters and 5% share).

Discussions

Evaluation of ecological capability due to the necessity of selecting and optimal utilization of ecological potential of land in the form of environmental planning and management studies in order to achieve the principle of sustainable development. Therefore, ArcView software has been used as the main software for the GIS software package to provide all available maps. In summary, the ecological capability assessment process is carried out in three general stages: (a) Identifying ecological indicators and their mapping; (b) Analyzing and summarizing the data; (c) Assessing the environmental capability of the land (Opri et al., 2010: 36 and 37).

The general development of low-impact development in the catchment area due to low-impact development (Table 2 and Figure 6).

Table 2. The general idea of sustainable environmental water resources planning with the help of low development development approach in the catchment area (Source: Writers).

Sections	General idea
Economical - spatial	Enabling and promoting sustainable, sustainable green agriculture
	Distribution of service power in a balanced way
	Promotion of knowledgeable industries, environmentally friendly and efficient
	The balanced development of the space transport network and its related environmental flows
	Sustainable development of tourism support services, national works and ... (based on ecotourism)
Sustainable environmental development	Protecting Natural Heritage (Protected Areas)
	Protecting green spaces, gardens and agricultural lands
	Avoid the proliferation of settlements
	Development of tourism with regard to ecological capability
	Preventing contamination of soil, air, water resources
Ecological sustainability (life and sustainability)	Communities are interconnected and integrated
	Access to safe water and basic public health for everyone
	Comprehensive, sustainable and sustainable cities
	With natural resources and coordinated with the environment
	Sustainable cities as part of sustainable regions
(Social and informational)	A literate community of blue and involved in decision making
	Total consumer power - Total social and environmental costs
	An information society community and high-level knowledge sharing on water resources
Optimized and water resource management	Correct, useful and available information
	Integrated and flexible policy-making, planning and leadership
	Blue Circle with Integrated Management
	All water resources, for a particular and reversible purpose
	Water Management System

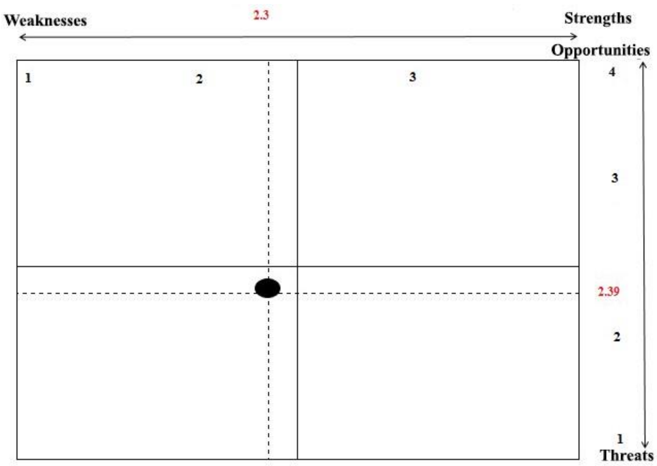

Figure 6. Assessing the Score Points and Selecting It for Development with Low Impact within the Basin (Source: Writers).

According to the study of the status of internal and external factors in the maps and table above, the system seeks to avoid external threats, due to the presence of internal weaknesses, that is to say, the area of study of the watershed in terms of strategic planning is in defensive mode Takes.

Configuring strategies by QSPM

Based on the table below, it is clear that the strategy is based on the declared strategies as well as the importance of each of them relative to the rest, and after evaluating the value of each pillar (each of the strategies) to the main or superior strategy (Table 3).

Table 3. Scoring proposed strategies based on the general objectives of the central desert watershed and salt lake with an emphasis on low impact development (Source: Writers).

		Strategic option							
		1		2		3		4	
Strategies	**Normal coefficient**	**Charm coefficient**	**Score**	**Charm coefficient**	**Score**	**Charm coefficient**	**Score**	**Charm coefficient**	**Score**
Maintenance of sensitive areas of the region against the development of residential, industrial, communicative	0.08	3	0.24	1	0.08	4	0.32	3	0.24
Restoration and restoration of degraded ecosystems in order to develop a healthy and productive environment	0.07	3	0.21	3	0.21	3	0.21	4	0.28
Protecting, controlling, refining and exploiting rangelands and quality vegetation	0.05	2	0.1	1	0.05	3	0.15	4	0.2
Planning and organizing of products from agricultural and agricultural land worthy of agricultural land	0.07	4	0.28	2	0.14	4	0.28	2	0.14
Emphasis on the liberation of rivers, aquatic ecosystems and natural landscapes	0.1	4	0.4	3	0.3	4	0.4	3	0.3
Development of rainwater ponds in mountainous areas and plains	0.09	4	0.36	2	0.09	3	0.27	3	0.27
Increasing green and open standards at the standard level using the potential of public spaces	0.06	2	0.12	1	0.12	2	0.12	2	0.12
Increasing communication networks with asphalt and porous pavement	0.07	2	0.14	2	0.14	4	0.28	2	0.14

and sewage system integrated									
Increased productivity of floods and runoffs	0.07	1	0.07	1	0.07	3	0.21	4	0.28
Increasing green and open standards at the standard level using the potential of public spaces	0.09	3	0.27	3	0.27	4	0.36	3	0.27
Integrating the planning and management system at different levels of water and wastewater management	0.1	4	0.4	2	0.2	2	0.2	3	0.03
Green Industry Development with Intelligent Filtering System	0.08	4	0.32	2	0.16	3	0.24	3	0.24
Setting the rules and guidelines for using the inland wastewater treatment system in place	0.07	2	0.14	2	0.14	1	0.07	2	0.14
Total	1	38	3.05	25	1.97	40	3.11	38	2.92

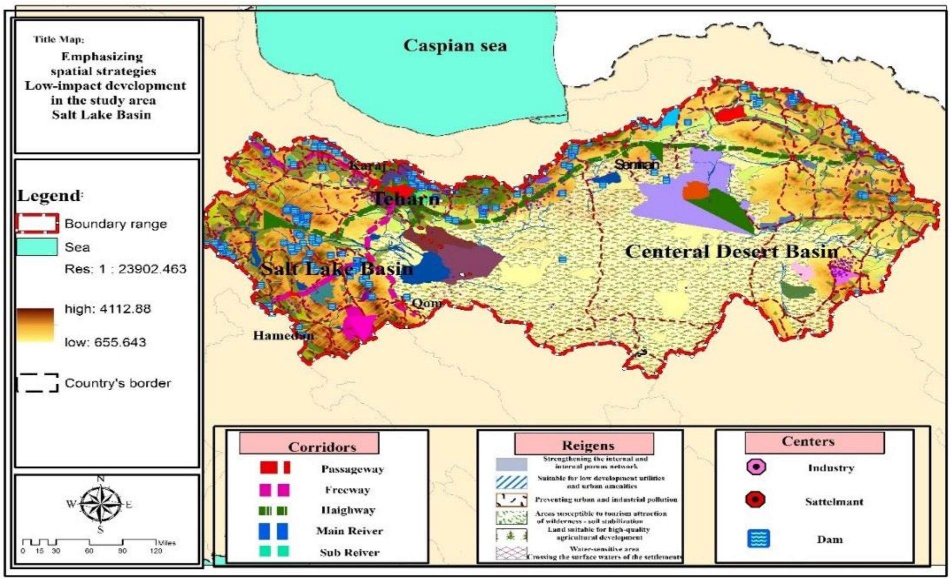

Figure 7. Spatial Strategies in the Study Area with Emphasis on Low Impact Development (Source: Writers).

Conclusions

The essence of Iran is low in water. The impossibility of natural water purification, the reduction of groundwater resources and the pollution of groundwater are among the problems facing Iran today. At present, urban, agricultural and industrial activities have produced drains, waste and pollutants, and also the discharge of urban sewage in some areas of water pollution to a degree that, rather than the fact that water and its abundance in the community provide human comfort, due to The severity of the contamination is due to it. Due to Iran's climate and climate, the low-impact development approach can help to maintain water resources and optimize their use. By applying this approach nationally, it can be better protected by its large hydrological elements, such as lakes and streams, and create a healthier and more beautiful environment on the urban and local levels. The low development of a new approach to design, urban planning and environmentally friendly planning. In fact, the old ways of designing cities and regions are an important part of good and successful design, which can simultaneously reduce development costs and protect the environment and create win-win conditions for users, stakeholders, and stakeholders, and this as one of The most prominent features of the low-impact development approach are introduced in urban design and planning. Part of the optimal implementation of this issue is related to political ecological issues, which is an important and largely neglected topic in the management of the city and areas related to environmental peripheral debate. According to the following diagram, one can consider the optimal planning and management in relation to the environment.

Ultimately, some of the challenges of the low-impact development approach, which can be confronted with the practical application of it, are introduced: many stakeholders and stakeholders in organizations and people are unfamiliar with the benefits of low development and how it is used in various environmental conditions. Usually attention to environmental issues is not practiced in development, and these approaches remain theoretical in the research phase. The current laws that control the design and construction of new city and district development are usually not sufficiently flexible to implement low-growth development solutions, and generally the implementation of the city's development plan and around it has been very low in this area. Appropriate zoning and land use planning is not in place in the city or is properly implemented, so implementation of low-impact development is problematic. There is no need for the city planners to see and analyze the environmental implications of existing zoning laws. Some low-impact development tools and facilities need to be protected and maintained by residents of the city and local communities, and this requires educational programs and government-subsidized facilities. The use of methods for penetrating water on the ground, if the amount of pollutants in the soil is high, may threaten the quality of groundwater, and rebuilding the aqueduct and restoring the abandoned aqueduct can be one of the most important tasks.

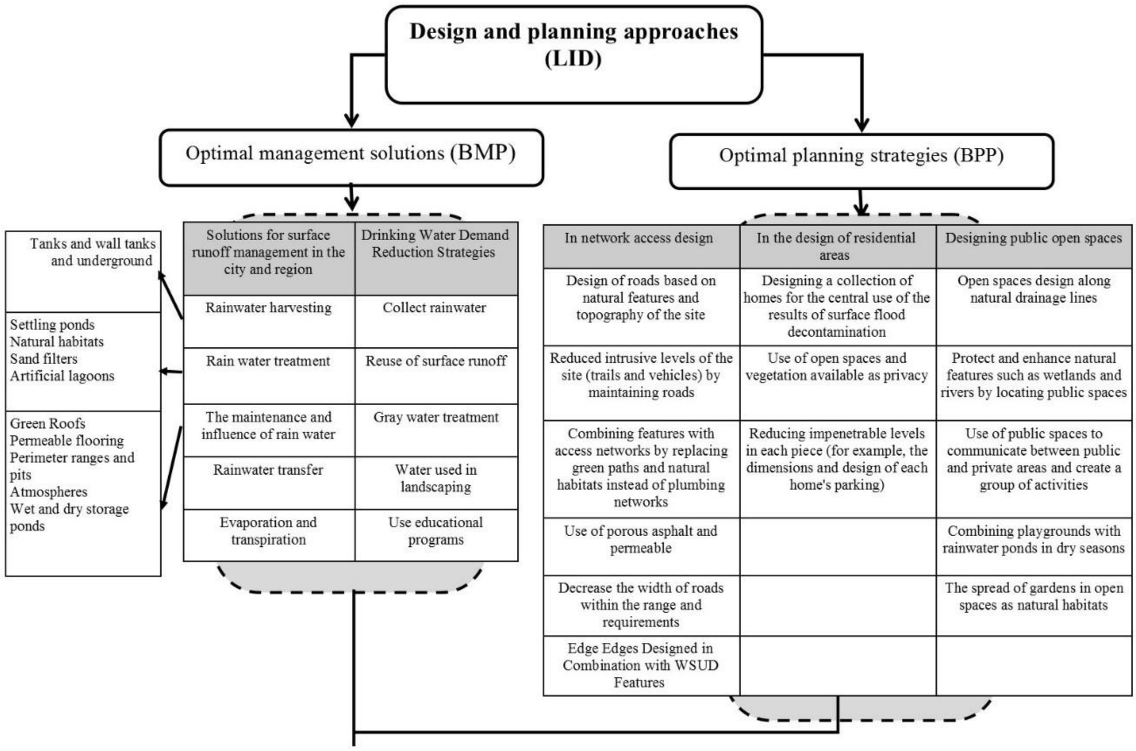

Figure 8. Ultimate and microeconomic solutions in the area of management and optimal planning of water management in residential and non-residential areas due to low development (sources: writers).

Executive suggestions and solutions

- Measures to minimize the waste of water resources in the use of livestock products and livestock products using rainwater collection basins or intelligent plumbing systems for water and wastewater from these units.
- Treatment of sewage and wastewater from industrial and industrial settlements on site and use of water for agriculture and irrigation of green spaces around the same area.
- Increasing the productivity of the industry and the use of smart equipment in the use of water resources.
- Preventing waste (waste) or reducing the amount of water refined in urban plumbing networks by modifying and replacing urban and regional wastewater pipes (over 30% of wastewater is consumed in urban network pipes).
- To reduce water consumption in the household sector, special waste from wastewater and the possibility of equipping for treatment and return to irrigation of green space in the same place.
- Removal of asphaltene sewage wells in urban and industrial areas in order to prevent the pollution of groundwater resources and the connection of sewage to the sewage system of the region.
- The use of collecting systems for rainwater, flood, runoff and pond construction will purify and collect these waters for irrigation of unregistered and organized open spaces of the same range.
- The related organizations must plan and plan for harvesting, water use, area and seed improvement and, with

special supervision and facilities in the agricultural and horticultural sector.

- Livestock breeders in the poor livestock range make changes in livestock feed structures.
- Farmers should increase the nutritional value of agricultural products through enrichment techniques to feed livestock in drought-stricken rangelands.
- Changes in the structure of the type of harvest and use of groundwater and surface water in agricultural lands due to the potential and abundance of water.
- Planting green spaces and trees in rivers and streams of water to use sewage and wastewater waste for irrigation of trees.
- Use of water resources above the buildings to manage the use of drinking water at the time of discontinuation and the open water source as well as the system for collecting rainwater from the gutters when rain falls in the building to irrigate the green space.
- Farmers should be advised by experts regarding the use of a variety of nutritional supplements in light of the reduced nutritional value of forages in drought situations.
- Having strategic environmental implications for all regional and national projects in the area of road network, construction of settlements, etc., in particular, having an accessory of water resources management for that area.
- Setting plans and plans for water management for open spaces and green spaces, gardens and ... interurban and regional boundaries with ambitious plans.
- Attention to the observance of rivers, rivers, protected areas, gardens, and ... by industrial settlements, roads and residential areas in order to prevent pollution and direct entry of wastewater into these areas.

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