

Strategic Planning of the Environmental Sustainable Development: A Case of Imam Khomeini Port

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Received: March 8, 2016

Accepted: April 11, 2016

Online Published: June 14, 2016

doi:10.5539/res.v8n3p102

URL: <http://dx.doi.org/10.5539/res.v8n3p102>

Abstract

The purpose of the present study is to compile the strategic planning of environmental sustainable development of Imam Khomeini port. Today, urban regions are regarded as the most basic units of global economic space. The planning on such regions is of high importance because it influences various aspects of human life. Previously, it was supposed that urban issues could be recognized and managed by intellection and science. Nevertheless, in recent years the attitude of system planning and sustainable development perspective have been included in urban planning studies that made serious doubts on this attitude to urban planning. SWOT is one of the most significant models of strategic planning which is used for identification of the strengths and weaknesses of internal and external environment of Imam Khomainsi port for sustainable development planning. To this end, natural environment, physical and human systems were investigated through GPS data, synoptic stations, geology data, census and urban comprehensive and developing plan. The results showed that positive and negative points of sub-systems i.e., weaknesses and threats were more than the opportunities and strong points of the system. Moreover, most of the internal negative points were related to the natural sub-system and most of the external threats were related to the physical aspects. According to the results, two main strategies including settling the buildings in the most appropriate direction towards climatic conditions and adapting the accessibility networks with principles of special climatic planning of passages are suggested.

Keywords: strategic planning, sustainable development, Imam Khomeini port city, SWOT model

1. Introduction

City is a dynamic and complex phenomenon which is faced with physical, social, economic, political and even cultural changes. Urban regions are regarded as the most basic units of global economic space (Hataminejad, 2011). The necessity of planning on such environments is significantly important due to its influences on socio-economic and environmental life.

Up to 1960, it was supposed that like any other phenomenon the urban issues can also be recognized and consequently supervised and guided by their belonging and different sciences. However, the subsequent experiences and changes made serious doubts on this attitude to city and its planning. As a result of these different attitudes to logical and comprehensive planning, a new model came prevalent in America and Britain in 1960 which became known as “Systemic Planning” or “Strategic Planning” (Mahdizadeh et al., 2007, pp. 59-61).

Strategic planning emphasizes nullifying, bias, infinity and imperiousness in planning process and management (Daneshpour, 2003). Sustainable development, as an alternative to 20th century schools, presents a kind of urban planning with a special charter for the 21st century. In 1987, World Commission of Environment and Development (WCED) pronounced that the most effective way to adapt the environment protection needs and economic development would be fulfilled only through applying a new method called “Sustainable Development” which can be considered as a mixture of development and sustainability (UNWTO, 1998, p. 32).

Based on the features and principles of sustainable development and in line with the general purpose of this study considering the interactive effect of city and climate and sustainability of development in Imam Khomeini

port city, and also regarding the issues and features of environmental system of this city, the sustainable development approach was used to answer the city issues and its development.

From systemic perspective in strategic planning, city is an open and dynamic system being in relation with different kinds of systems and numerous sub-systems (Mahdizadeh, 2007, p. 255). This system is in relation with other systems in its environment including sub-systems itself. In relation with city system, the environment will also affect the different urban sub-systems. Sub-systems of urban environment include nature, human and the physical aspect (natural of human made).

To consider the challenges and solutions of urban environment in the course of interactive effect of city and climate, The interconnectedness of the introduced sub-system with each other and the entire urban must be checked; thereby the challenges and negative impacts of elicitation and ways to eliminate them and create the optimal connection can be presented.

Checking the various features of the case of this study reveals the necessity of adapting physical development of the city with harsh climatic features to coordinate the developments with the maximum comfort of human societies and sustainable conservation of resources and attractions in the city and region. Thus, the present study is devoted to the planning of sustainable development of Imam Khomeini port city. To recognize the present the governing problems and restrictions is the main purpose of this study. Strategic planning process will go ahead to achieve to proposed strategies and develop strategic proclamation with a focus on climatic plan.

2. Methods

The dominant approaches in the current study are qualitative and quantitative and the type of research is applied. The research methodology is descriptive analysis. The required data has been gathered by use of library documents and precise location information, synoptic stations, geology, master plans and urban detailed census data. Herein, the internal and external environmental structure of Imam Khomeini port city has been evaluated and analyzed using the SWOT technique.

2.1 Methodology: Strategic Planning

Strategic planning is a process to equip the resources and unite the efforts to achieve long-term goals and policies according to internal and external constraints and possibilities. The key concepts in strategic planning include perspective, mission, goals, strategies and policies, internal strengths and weaknesses, opportunities and external threats.

2.2 Strategic Approach for Imam Khomeini Port City

Concerning the requirements of the present case study, the steps and methods of the strategic planning approach should be compiled in the research framework.

SWOT model is among the most important models for strategic planning. It is a research method for analyzing a certain status-quo. SWOT analysis, also known as SWOT matrix, has often been used in the field of business and extended to that of natural resource management with the aim of assessing a given decision, project or policy directive in a systematic manner (Schmoldt, Kangas, Mendoza, & Pesonen, 2001). In addition, it has been applied in assessment of sustainable tourism (Reihanian, Binti Mahmood, Kahrom, & Hin, 2012).

This method is based on two analytical levels, which are conducted separately:

- 1) First step is to analyze the internal factors (local analysis) containing a discussion on strengths and weaknesses according to the aims of the SWOT;
- 2) Second step is to analyze the external factors (global analysis) consist of a discussion on relevant opportunities and threats (positive/negative framework conditions, potential chances and risks) (Harfst, Wirth, Lintz, & Bieberstein, 2010; Ghorbani, Raufirad, Rafiaani, & Azadi, 2015).

Urban system has sub-systems including the physical (physical environment of the city), human (city population) and natural environment (the contexts and climate) subsystems. To evaluate the effect of city and environment on each other, their interactive effect should be considered. So, physical, natural and human sub-systems of Imam port city are investigated based on the criteria listed in Table 1 to define the analyzable areas in SWOT.

Table 1. The criteria for sustainable development of Imam Khomeini port city

The criteria	Sub-system
Geographical conditions	
Limiting and shaping factors of the city form	
Climatic features of the city (temperature, moisture, wind, raining, sun shining), and geographic features of the region (agrology, water sources and seismology)	Environmental sub-system
Climatic conditions and human comfort	
The emergence of the city	
The range of hinterland	
The developments in the city limits	
The major elements of city structure	Physical environment sub-system
Different residential textures and the towns	
Building density in the city	
The limitations and facilities of physical development of the city	
The trend of the future development of the city	
Investigation of demographic trends in the city during urbanism	Human sub-system

Analysis is considered as a part of strategic planning process to reach the goals of strategic planning. SWOT analysis is introduced in the course of urban environment sub-systems that are natural, physical and human sub-systems. SWOT comes to a strategic selection with analyzing the internal strengths, weaknesses and external threats of a system. Thus, by putting together any of the internal factors with the external factors, different strategies can be derived from it. The result of this process is four special models to match the internal and external conditions of the system. These four strategies of model include (i) invasive-competitive strategies: Strength and Opportunity (SO), (ii) diversity strategies: Strength and Threat (ST), (iii) Weakness and Opportunity (WO), and (iii) defensive strategies: Weakness and Threat (WT) (Sariisik, Turkay, & Akova, 2011; Reihanian, Binti Mahmood, Kahrom, & Hin, 2012).

According to scientific researches on the environmental characteristics of environmental subsystems of Imam Khomeini port city, internal strengths and weaknesses as well as the opportunities and external threats of the system are offered as: 5 strengths, 21 internal weak points, 9 opportunities and 13 external threats. In other words, 26 internal factors were faced with 22 internal ones. It can be concluded that the conditions of city development should be more affected by internal factors rather than external ones. Table 2 shows the SWOT matrix for strengths and weakness of Imam Khomeini port city.

Table 2. SWOT model for analyzing the strengths and weakness of Imam Khomeini port

Internal factors	External factors	Sub-system
Strengths	Opportunities	
s.1. Earthquake danger in downside	o.1. Using sun energy	
s.2. Cold and temperate winter	o.2. Using wind energy	
s.3. Having dominant north-west and south-east and eastern-western wind	o.3. Jarrahi river in the north side	Natural
	o.4. Numerous bays around the city	
	o.5. Controlling the high tide of the bays and blood prone condition of the region in spite of floodgate beside railway	

	o.1. The suggested high way of transportation for in the east for ultra-urban traffic	
s.1. Following of some textures and city structures from sustainable environmental principles	o.2. Suggesting the second service center	physical
	o.3. High potential of empty lands to provide the city services	
	o.4. Using the underground water	
s.1. Balancing population growth from 1986-1996		Human
Weak points	Threats	Sub-system
w.1. Low latitude		
w.2. Sun ray verticality and impossibility of causing shadow in the midday		
w.3. Soil salinity	t.1. Land flood controlling nature due to low soil permeability	
w.4. Low burden carrying resistance and power of soil	t.2. Over flooding the bays around the city	
w.5. Over-heating in most days	t.3. Impossibility of using dominant winds of the region to cause air circulation due to dusty winds	Natural
w.6. Humid weather		
w.7. Dusty wind blows		
w.8. Low and imbalanced rain		
w.9. Salinity of underground water		
w.10. High level of underground water		
w.11. Low absorption power of the soil		
	t.1. Environmental pollution due to lack of sewage system and concentration of surface water	
w.1. Population irregular growth and service levels during urbanism	t.2. Creation of marsh from sewage and slum growth around it	
w.2. Infirm and divergent textures in different areas	t.3. Low ability of soil fertility for cultivation	
w.3. Slum and low quality housing	t.4. Absence of floodgate around the city	Physical
w.4. The lack of association between buildings and urban texture with environmental features of the region	t.5. Inappropriate intervention of regional communication	
w.5. Shortage if urban services	t.6. Railway environmental pollution	
w.6. Sun shining passages	t.7. Reduction of the city streets security with heavy vehicle traffic	
	t.8. Asphalt factory in southern ingress	
w.1. Increasing ascendance of the city absolute population		
w.2. High family aspect	t.1. Disturbance of population balance and activity in the region	Human
w.3. High migration and low urban entity	t.2. Shortage of water supply resources	
w.4. Superiority of population growth to service and infrastructure development		

2.3 Strategic Model from SWOT Strategic Analysis

SWOT matrix provides the compilation of four different selection or strategy; however, these strategies can overlap in practice. “Aggressive-competitive strategy” is the best situation that the system seeks to maximize its internal strengths and take maximum advantage of external opportunities with the peace of mind. “Diversification strategy” is compiled based on taking advantage of the strengths of the system to deal with the threats. “Revision strategy” attempts to take optimized advantage of opportunities through reducing the weaknesses. The overall goal of “Defensive strategy” is to reduce the system’s weak points in order to lower and neutralize the threats (Gholami, 2012).

Facing each other any set of internal and external factors, Table 3 shows the quadruple strategies for Imam Khomeini port city.

Table 3. The suggested strategies for development planning of Imam Khomeini port based on SWOT model

The suggested cases	Strategy type
Using natural energies of sun, wind to supply the needed energy of the region	
Building a high way for heavy vehicle traffic	
Making balance between presentation of services and population supply in the neighborhoods (the balance between population and activity in the city)	Aggressive-competitive strategy (SO)
Promoting urban green space to increase air quality	
Supporting the second city service center	
Using natural energies of sun and wind to ventilate the environment cultivating saline-resistance plants to control flood, increase soil resistance and keeping the light border	
Covering the whole city with sewage system and collecting surface water	
Reducing flood proneness of the region	Diversification strategy
Increasing the power of settlement attraction and impact area with quality and quantity promotion of servicing and welfare infrastructures of the region	
Controlling railway environmental pollution through making green space around the station and railway	
Adapting access network with special passages climatic design principles	
Locating the buildings in the most proper direction in line with climatic features	
Full and empty definition of the texture and all stages of construction and making spaces with climatic design principles	
Increasing soil resistance and its fertility	Revision strategy (WO)
Supplying the needed services for the population of each neighborhood in empty lands of the neighborhoods	
Supplying the edible water through refining the saline underground water	
Promoting the neighborhood identity in city neighborhoods	
Prohibition of heavy vehicle traffic from urban passages	
Controlling the flood of extreme climatic downfall and surface water in rainy seasons through making surface water collecting network	Defensive strategy (WT)

and using it in low-rain seasons

Controlling the bays' high-tide with covering their frontage with green space and resisting plants

Protecting the buildings and spaces against dust penetration

Controlling the environmental pollution made by concentration of polluted water through all-inclusive city sewage system

Removing slums and settling them in social habitats

Using strategies the highest possible amount of shade

Supplying the service shortages in neighborhoods' level

By studying the urban environment of Imam Khomeini port expressed in the aforementioned format system, it was observed that internal and external negative points of sub-systems i.e., weak points and threats had higher number and requirement in relation to strengths and opportunities of the system. In addition, most of internal negative points were around natural sub-system and most of the threats were physical. So, these negative points should be minimized using the opportunities to provide a desirable life conditions for the citizens. Especially in case of environmental weaknesses, it will be reduced by architectural design opportunities matched with the climate and will be close to desirable life conditions.

2.4 Compiling the Announcement of the Strategies of Urban Quality Development for Imam Khomeini Port

The last phase of strategic planning process is compiling the strategic plan. To this end, first the ideal perspective of the city development is drawn; then, regarding the considered purposes in development of the city, the goals of the program are explained. Next, in order to achieve these goals, the strategies to be adopted and the policies to achieve these strategies are suggested.

2.5 Announcement of the Perspective

The environmental perspective document of Imam Khomeini port answers to the question that how will be the future of the industry of the city environment (Gholami, 2012). So, the environmental sustainable development of Imam Khomeini port is compiled as follows:

“Imam Khomeini port is an environmentalist city. The energy used in the city is clean and sustainable. The citizens are working in all the city spaces and structures in complete comfort”.

2.6 Compilation of Goals, Strategies and the Suggested Policies

In planning, the goals state how the desirable and appropriate situations are achieved (Gholami, 2012). Strategies are planning decisions that coordinate the objectives of a program or plan and determine the main ways to achieve them (Mahdizadeh, 2007, p. 275). The suggested goals, strategies and executive policies for Imam Khomeini port are presented in Table 4.

3. Results and Discussion

Due to the importance of climatic planning strategies in human comfort as one of the purposes of the present research, the proposed policies are described in a more practical manner.

3.1 Strategy 2: The Buildings Establishment in the Most Appropriate Direction to Comply with Climatic Features

One of the most important factors that affect the formation of residential environment is the buildings establishment direction and access to networks. To determine the proper posture for buildings establishment some important factors must be considered including access to buildings, slope and topography, connection with neighboring buildings, the perspective and the climatic conditions. Economic facilities and cultural issues, construction method and climatic status of the place are decisive factors in determining the relative importance of the aforementioned elements in determining the buildings establishment direction.

Herein, only the climatic conditions of Imam Khomeini port are considered in the buildings establishment direction.

The role of various climatic factors in determining the buildings establishment direction in various climatic conditions is different. In warm areas, the aim is to avoid gaining heat from the sun shining. In humid areas, attempts are made to use up the local winds to cool the interior space of the buildings. According to the building

thermal needs and the existing natural facilities in special climatic conditions of Imam port, the priority criteria for establishing the buildings can be defined as follows:

- 1) Obtaining the minimum solar energy in warm times;
- 2) Preventing the direct sun penetration to interior space in warm times;
- 3) Preventing or reducing the effect of hot and dusty winds in the interior and exterior space of the buildings;
- 4) Obtaining solar energy in cold times;
- 5) Supplying the airflow in interior spaces when necessary.

Attention to the ration and relative importance of these factors is necessary in determining the direction posture because the supplying of the building needs in relation to all of climatic elements is possible.

The first, second and fourth criteria are related to determining the buildings establishment direction influenced by sun shining and the third and fifth criteria are related to the effect of local wind blows. In this part, the most appropriate direction for the buildings establishment is determined in relation with these two climatic conditions.

3.1.1 The Buildings Establishment Direction and Sun Shining

The first priority in the buildings establishment direction is “obtaining the minimum of solar energy in warm times and maximum amount in cold times”.

The first step in determining such a direction is to specify the hot and cold times of the year. The curve shows the effective temperature of 22 °C. In relation to obtaining the solar energy, the limited times to 22 °C curve are called hot times and the outer times are called cold times. Comparing these times with the whole hours of day in a year reveals that Imam Khomeini port needs solar energy in buildings (42%) and the lack of need (58%) of the hours.

The next phase is to calculate the total amount of solar energy shone on perpendicular surfaces located in different geographical directions. The surfaces located at south-east and south-west receive the highest and northern surfaces receive the lowest annual solar energy.

South-west direction precisely acts opposite of the criteria set for the selection of the buildings establishment direction, i.e., it receives the highest solar energy in hot times and the least amount in cold times.

Since the purpose of determining the establishment direction is to obtain the least amount of solar energy over the year or in hot times, the north direction is the most appropriate direction for building establishment. However, as it was discussed in thermal needs of the buildings, obtaining some solar energy in cold times is also necessary in this climatic area. Referring to Table 5, it is clear that the 15⁰ eastern direction (the perpendicular line on the building facet rotated 15⁰ from south to east) is the most appropriate direction for building establishment due to capture of the highest solar energy in cold times and the least one in hot times. 60⁰ eastern to 15⁰ western directions are also appropriate in this sense.

Table 4. Strategic announcement of environmental development of Imam Komeini port city

Policy	Strategy	Goal
✓ Covering the whole city with sewage system, collecting surface water, and saving them for optimized use when needed		
✓ Cultivating saline-resistance plants to control flood and increasing soil permeability	Reducing flood danger	
✓ Making and supporting the paths' frontage of the bays with green space coverage and resistant plants		Urban environmental sustainable development
✓ Passages orientation to make the maximum of shade in the summer middays	Adapting access networks with special climatic design of passages	
✓ Obtaining the minimum solar	Locating the buildings in the most	

energy in hot times	appropriate directions to adapt with climatic features	
<ul style="list-style-type: none"> ✓ Preventing the direct sun penetration to interior spaces in hot times ✓ Preventing or reducing the effect of hot and dusty winds in interior and exterior spaces of the building ✓ Obtaining solar energy in cold seasons ✓ Supplying airflow in interior spaces in necessary times 		
<ul style="list-style-type: none"> ✓ Creating compact residential texture ✓ Appropriate establishment of the structures to have the highest possible shade and use of desirable winds ✓ Using heavy materials with higher delay time ✓ Using thermal insulator in walls ✓ Light exterior surface of the walls ✓ Embedding the least windows and openers in walls in the smallest facets if used 	<p>Full and empty definition of the texture and all phases of construction and creation of the spaces with climatic design principles</p> <p>Using architecture elements associated with environmental features</p>	Promoting the life quality of the citizens
<ul style="list-style-type: none"> ✓ Changing purchase time and personal works from the final hours to beginning ones and changing purchase pattern with the order of commercial spaces and etc. 	Maximized compatibility of activities and spaces with climatic features	Sustainability of energy use
<ul style="list-style-type: none"> ✓ Using appropriate coverings adapted to hot and humid climate ✓ Locating green surfaces in neighborhoods especially in city center in line with the suggested city capititation comprehensive plan ✓ Designing waterfront and using fountains in the center of the city to adjust the temperature ✓ Building awning on the walls of sun exposed passages ✓ Refining underground saline water for edible water 	Using natural surfaces and spaces ventilating the environment	
<ul style="list-style-type: none"> ✓ Using surface water collecting system and refinement for various uses 	Supplying the water requirements for the citizens	Climatic comfort
<ul style="list-style-type: none"> ✓ Making a sewage system for the whole city 	Reducing environmental pollution	

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- ✓ Organizing and supporting trash collecting and recycling system
 - ✓ Controlling and reducing the environmental route pollution and railway station
 - ✓ Building protective walls based on new perspective and sound models
 - ✓ Making green space for the western belt which is the distance between rail to the beginning of the city in the form of mean trees longitudinally
 - ✓ Artery-like communication through flyovers and defining the frontage to solve the problem in long-term and short term plans is very effective
 - ✓ Prohibition of heavy vehicles from the city passages
 - ✓ Building highway around the city for heavy vehicles traffic
 - ✓ Making operation systems of solar energy such as solar panels in supplying the energy for homes, spaces and industries
 - ✓ Making operation system of wind power such as huge fans to supply the needed energy
 - ✓ Controlling the density around the city neighborhoods which have low potentials to supply the services
 - ✓ Simultaneous construction and service in the new developments
 - ✓ Supporting the second city service center
 - ✓ Loading the proper population with the presentable services in every neighborhood
 - ✓ Supplying the needed services of population in every neighborhood in the interior empty lands of the very neighborhood
 - ✓ Organizing and supporting council system and taking maximized use of public participation
 - ✓ Creating and defining the
- Using clean energies to supply the needed energy for spaces and locations
- Making balance between service supply and population demands in the neighborhoods (the balance between population and activity in the cities)
- Promoting the city and neighborhoods identity
-

neighborhood center in every neighborhood/making and defining concentration spaces in different city scales

- ✓ Locating and planning the neighborhood center with proper uses and spaces with the city climate and culture
- ✓ Creating social housing and settling dwellers in residence with the least residential standards
- ✓ Reducing migration to the city through regional planning to promote the quality and the quantity of services and welfare infrastructures of the region

The second priority in determining the most proper direction to settle the buildings is preventing the direct shine to interior space in hot times. One of the simplest methods of prevention or the so-called shining control is using horizontal awning protruded above the windows.

Table 5. The total solar energy shines on the main facet of uni-directional buildings in hot times (Kasmai, 1990)

Percent	The amount of energy	Angel of building	Direction of energy	Row
63	2956	S	south	1
62	2917	15	+165	2
67	3133	30	+150	3
71	3345	45	South east	4
74	3450	60	+120	5
73	3451	75	+105	6
70	3271	E	east	7
72	3392	15W	-165	8
85	3982	30W	-150	9
95	4427	45W	South west	10
100	4678	60W	-120	11
100	4674	76W	-105	12

3.1.2 The Buildings Establishment Direction and Wind Blow

The third and the fifth criteria of the buildings establishment which prevent the effect of hot and dusty winds in interior and exterior spaces of the buildings and supplying the air flow in interior spaces when necessary are related to the effects of wind blow in the buildings. To determine the buildings establishment direction in relation to these two criteria, the direction of dusty and desirable winds should be specified.

To prevent or reduce the effect of dusty winds in interior and exterior building spaces in the third criteria that has more importance than supplying the internal airflow for the buildings, the most appropriate direction is leeward side. Supposing the cleanness and usability of the winds with cold breezes in natural ventilation of interior spaces, it is not necessary the direction of wind to be fully perpendicular to the main facet of the building. When the angle between wind blow and building facet is 90° to 45° , the impact of the wind in flowing the air in interior space of the building is very high. Figure 1 shows the acceptable directions compared to dominant and second hand winds are shown.

Regarding the acceptable directions for these two winds, it is concluded that total 22.5° western directions to 22.5° north-east direction are the acceptable directions for using wind blow to produce airflow in interior space of uni-directional buildings. However, as observed, none of these directions are suitable in terms of sun shining.

In case of bidirectional buildings, supposing the effectiveness of two winds in creating wind blow in interior space, south-north to east-west and east-west to south west-north east are appropriate directions and the others are acceptable. As observed, regarding bidirectional buildings, the proper southern direction is dominant on sun shining and wind.

As a final result in determining the buildings establishment direction in relation to sun shining and storm, given that airflow in interior space is not necessary and the existing winds become storm, it is suggested to select the direction being fully appropriate in relation to sun shining. The impact of dusty winds on interior and exterior spaces of the building will be decreased by surrounding the buildings with relatively high buildings.

To supply airflow inside the building, the pressure difference resulted from temperature difference in different levels or heights of the building can be used. When the weather gets warmer, it becomes lighter and goes up. When there are some apertures in the highest or lowest parts of the interior space, after getting warm and going up, the air gets out of the upper apertures and is replaced by cold air in lower parts. In normal conditions, the speed of such flow is very low. The speed depends on the height difference between air ingress and egress. The airflow rate and the effect of its conditioning increases with increase of the difference between air ingress and egress. Therefore, the taller buildings are more appropriate for conditioning. Probably this is a reason of selecting tall roofs in local buildings of the port. When the entered air is passed form a lattice and shady place, it is colder than the outer air and it has more impact on cooling the internal airflow of the building.

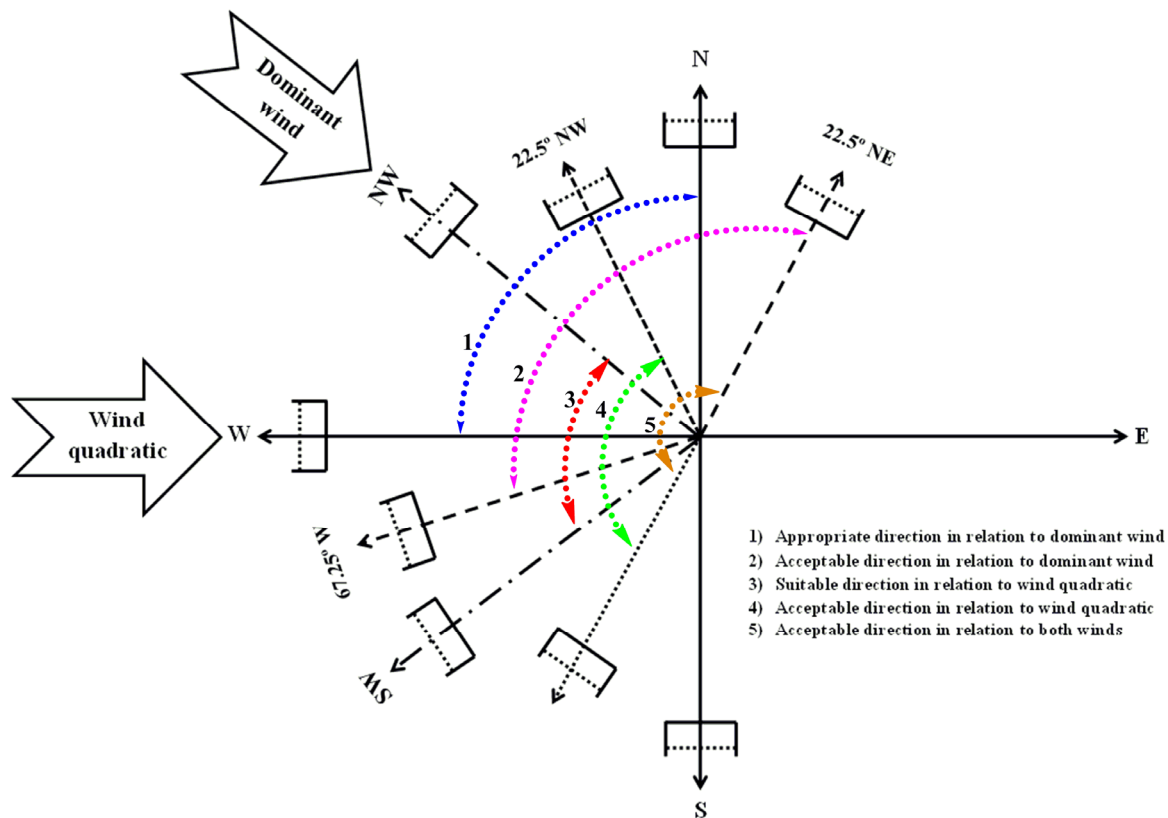


Figure 1. The proper direction of uni-directional he buildings establishment to wind (Kasmai, 1990)

3.2 Strategy 3: Adapting Access Networks with Climatic Design Principles Related to Passages

Orientation of the streets is influenced by numerous factors like building orientation. Only climatic factors are considered here. To determine the most appropriate direction of the streets in the summer to have more shade, the amount of the shade in different directions should be calculated. Based on the shade model, north-south streets of 15° east and 15° west ones have the most appropriate directions.

The amount of the shade made by 3-meter high walls in the midday is very low (less than 10 centimeters). Therefore, due to the urgent need to shade in highly trafficked ways, embedding awnings is necessary.

If awnings and other instruments of artificial shading are used to make shade in both sides of the streets, such awnings overshadow the performance of street directions. In other words, if it is decided to use awning for making the artificial shade, there is no need to consider the street direction for shading. The direction of such ways or streets can be selected by other factors such as the most appropriate direction in relation to buildings or non-climatic factors.

4. Conclusion

The strengths and weaknesses in internal and external environment of Imam Khomeini port city have been investigated using the SWAT model for sustainable development planning. For this purpose the natural environment, physical, and human subsystems have been studied using location data, synoptic stations, geology, census data and comprehensive and detailed urban plans. The results have shown that positive and negative points of subsystems i.e., the weaknesses and threats had greater urgency than the strengths of the system. While most of the internal negative points are related to natural sub-system and most of the external threats are pertained to the physical aspects. Accordingly, two main strategies including establishment of the buildings in the most appropriate direction towards climatic conditions and adapting the access networks with principles of special climatic planning of passages are suggested.

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