

Sustainable management of Kiyān Spring view point of recreation

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ABSTRACT: Active tectonics has caused development of many structural elements and fractures. Power, influence, and cultural life of civilization societies during their evolution have been created by the existence of forests and natural reserves. Conservation and management of these resources is essential in the Iran which is considered as one of the most arid regions of the world and also in terms of biodiversity have the potential too. The study area (kiyan forest reserve) located in 12 kilometers of the Nahavand city whit southwest. In this study entitled "Sustainable management of Kiyān Spring view point of recreation" first has done Land use planning with ecological models. The results land use planning of Kiyān Spring as a homogeneous management zone indicated which best option is protection (National Natural Monument) and the second option is Tourism (recreation outdoor); Therefore proffered this region converted to National Natural Monument and utilization of them based on need not greed.

Keywords: Sustainable management, recreation, Kiyān spring

INTRODUCTION

Active tectonics has caused development of many structural elements and fractures (Yazdani & Aryamanesh, 2013). Power, influence, and cultural life of civilization societies during their evolution have been created by the existence of forests and natural reserves. For optimum use of natural resources for sustainable development, there is a need for identifying ecological resources in the shortest period of time and minimum possible cost. Growth of population depredated environmental and recreational resources (Watt, 2004). Probers have argued that welfare is equal whit value of forest resources divided on population (Mosadegh, 2004). In this regard, one of them is recreational use of forests, the growing tourism industry as a source of income for improved social and economic conditions of native people; also these capabilities are principles of forest sustainable use. Iran can be considered as one of the top countries in the world from of view natural diversity, presence of four full seasons and attractions of Islamic Iranian (Rezvani, 2001). Management programs of natural resource should be done with proper segmentation until utilization of natural values and ecological potential in order achievement Sustainable development (Pir Mohammadi, 2008). Several methods are to determine of ecological potential; for example, for feasibility and potential of tourism can be use SWOT method (Strength-Weakness-Opportunities-Threats) (Mohammadi Deh Cheshmeh & Zangi Abadi, 2008). Kiyani, (2011) used matrix analysis for investigation and use change in Taleghan area. Strategic Analysis is an important step in the planning process (Ahamdi, 2007). Kiyān Spring is remnants Zagros forest in the west of Iran and has status of stable (climax), Particular floristic composition and high species richness (405 species), this factors are important reasons for choosing it as a genetic reservoir (Safikhani, 2007). In this order to Kiyani and Kiyani (2010) in order to Evaluation of the Kiyān Spring for manage ecosystems showed due to grazing and use of more than ecological carrying capacity, decreased there capability. Shayan, (2012) showed exist of numerous springs and Kiyān forests, genetic reserves, have reasons for

higher combination score (view point of tourism); and stated absorption of tourism will improve economic status of native peoples. Therefore is necessary to maintain its existence in every possible way and then restoration. The aim of this study was Land use planning of Kiyan Spring for Strategic Management.

MATERIALS AND METHODS

Kiyan spring located in 12 km southwest of the Nahavand city. This area is in North latitude of 34° and East longitude 48° and average altitude its 1,700 meters above sea level. In This area has protected species such as *chestnut*, *walnut* and *hawthorn* and has trees over 500 years old. The area of its natural forest is 100 acres and totally with destroyed forests and implanted is 500 hectares (kiyani & kiyani, 2010). The cover of pasture plants is between 20 to 80 percent. The maximum temperature of summer is 40°C and 25°C in winter. Nahavand township view of point geomorphology divided to three physiographic sections: Alluvial Plain, Piedmont Plateau and Alluvial Fans. Kiyan region located within Alluvial Fans (Khezeli, 2000). In this region because of ground limestone, water from precipitation dissolve with lime and penetrates the ground easily and Cartesian surface of ground water is up. Aqueous of Kiyan spring around 2,500 liters per second which after drinking purposes and agricultural uses flowed into the Gamasyab River. Figure 1 shows the location of Kiyan Spring in the Nahavand Township.

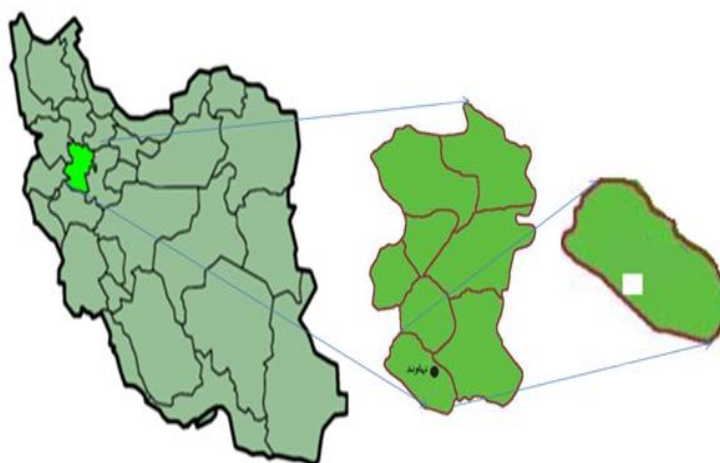


Figure 1. position of kiyan Spring in the Nahavand Township

Figure 2 shows Satellite image of Kiyan Spring and Kiyan city, using Google Earth spatial information database. Kiyan region has semi-arid climate and cold steppe, summers are relatively mild and winters are relatively cold. According to the regional meteorological center of Nahavand city, rainfall average is 360 mm (maximum is 479 mm and minimum is 221mm); annual average temperature is about 20°C .



Figure 2. Satellite image of kiyan spring

Method research has been survey- analysis based on field studies. Basic information of this research is based on analyst of detail studies to identify ecological resources. The characteristics of these models are based on hydrological, geomorphologic, climate and vegetation assessment and classification of the land. Ecological model of tourism and recreation has three classes; Forestry has seven class and range management has seven classes too (Makhdoom, 2006). Ecological models forums are general guide for assessing the ecological application. Therefore, based on hydrological characteristics, geomorphologic, climate and vegetation area should be developed specific model (Makhdoom, 2009). Models of tourism, forestry, conservation and grass land management were prepared in accordance with Nahavand region and they were compared with characteristics of the study area. To identify ecological resources of forest reserve Kiyan, scientific literature reviews and field studies too; view of point physiographic Nahavand township divided to three sections: Alluvial Plain, Piedmont Plateau and Alluvial Fans. Kiyan area in Alluvial Fans section; Alluvial Fans have deep soil and high gravel generally (Khazli, 2000).

RESULTS AND DISCUSSION

Table 1 shows Characteristics of environmental units of Kiyan forest reserve. Priority indicators in the evaluation ecological model of tourism are: slope, stone, geography, water, vegetation, climate and weather. If the slope is not appropriate for tourism area, will avoided investigate of other parameters (Makhdoom, 2006).

Table 1. Characteristics of the environmental kiyan spring

Zone name (units)	Kiyan Spring
Ecological features	
Altitude (m)	1600-1800
Percent slopes	More than 8 percent
Geographical aspect	Western North - Eastern North
Type of soil and rock	Sandy - loamy of half deep and calcareous rock
Vegetation type and density	Oak, sycamore, hawthorn, ash, hackberry, Arjan and wild almond with density of 10-70 percent
climate	Semi-arid (cold steppe to temperate alpine)
Water resource	Kiyan springs with 1.2 m2/s
wildlife	partridge, porcupine, jackal, wolf and goats * Habitat has destruction
Erosion risk	risk of landslides and erosion is Moderate to high

According to world association of tourists, nearly 40 percent of travel incentive is estimated ecotourism and visiting natural attractions (Ecotourism Regulations, 2005). Kiyan Spring view of point natural and attractive is unique in West of Iran; for continue utilization in order to develop tourism will need determined ecological potential. After comparing features of Kiyan Spring whit ecological model, potential of area described in Table 2.

Table 2. Assessment of ecological potential Kiyan spring

Land use type	Protected area (National Natural Monument)	Tourism or recreation outdoor (3 class)
Unit name		
Kiyan Spring	-Genetic value of rare species (such as oak, dangle tulip and squirrels) -source of water for agriculture value -Educational -Recreation Place	1

Ecological resources of Kiyan Spring Compared for tourism and conservation. Results indicated this region has class 1 for recreation outdoor, and has high potential for protection. Figures 3 show landscapes of Kiyan Spring which validated results for determination of ecological capability.



Figure 3. landscapes of Kiyan Spring

For Sustainable management, results of this study were combined with previous studies. It necessary to take management strategies and sustainable programs to avoid future risks (Mazaheri Kohanestani, 2013). Albeit social network size plays a significant role in enhancing adoption of natural resource management practices. Moreover, external sources of information such as extension provision play a crucial role in enhancing adoption of resource management practices (Tsfamicheal, 2013). Finally Kiyani (2013) told land use planning will be implemented in a finer scale so that each land use will be applied in the suitable place with its maximum potential. Figure 4 shows waterfall provided of stocks snowy in this area; in some there deep of snow reserves is more than 200 meters. Finding showed which Source of water Kiyan Spring is top raining and Kerstin structure whit Dalen keeping of ice and water; snow in Dalen provide by hurricane and with gradual molten of snow and ice formed springs of kiyan in subordinate.



Figure 4. waterfall provided of stocks snowy

CONCLUSION

Principle of ecology in easily can be into the design and planning, so this approach to solving environmental-social Difficulties in future development planning is decisive between of program. In this order Sustainable management of Kiyan Spring view point of recreation Kiyan indicated spring remnants Zagros forest in the west of Iran and have status of stable (climax), Particular floristic composition and high species as a genetic reservoir. Results multi criteria evaluation method indicated this region has 1 potential for recreation outdoor, and has high potential for protection, therefore kiyan forest reserve as a homogeneous zone management, the best option is conservation (National natural monument). Therefore should inform local people and tourism with distribution of guide brochures by Kiyan municipality, Increase the number of personnel and survey the Kiyan forest reserve, Move the toll station to the entrance of area, Protection of forest reserve landscapes, Get toll from all the visitors (now, the native people are exempt), Daily garbage collection in the area and Finally, in order to sustainable development proffered this region converted to National Natural Monument from view point of management level which is one of areas supported by the Environmental Protection Agency; and utilization of them based on needs not greed.

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