

Ecological Evaluation of the Natural Landscape of Fars MARGOON Waterfall in order to Clarify Methods of Ecological Maintenance of the bed

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Abstract:

"The ecological outlook of landscape" is one of the latest outlooks searching to find equivalents for the agreement with nature, so as to recognize difficulties, warnings & especial characteristics of natural landscape, and to present protective methods in such landscapes through ecological evaluation (Evaluation of patterns, structures & landscape mosaic) and recognition of the existing disturbances in the natural rhythm of the landscapes. Therefore this paper has proceeded to present methods for the ecological maintenance of the natural process and attraction of tourists through the results from the ecological evaluation of the natural landscape of MARGOON. The methods like: designing visual platforms in a higher level than the ground, using trees and green shrubs for covering the ground, removing the tourism parking from the riverside territories, creating protective shields around the riverside trees by growing short birches and also removing recreationally unsuitable activities like camping from the natural territories of the riverside trees. To do it, this research has made profit from the descriptive-analytical & comparative research method.

Keywords: *Landscape- Natural landscape - Ecological evaluation, Ecological maintenance, FARS MARGOON waterfall of Iran-*

1-Introduction:

Consistency of ecosystems and environment originates from balance & equilibrium phenomena. Ecologic balance happens when a fluent balance is created between the total number of animate and inanimate components in ecosystem. Whenever the amount of operation from a source or the amount of the loss to a source is higher then the power of nature in compensating the source, in this case a disorder happens and it'll destroy. Unlimited operation, qualitative change and overthrow of sources by

pollutions will cause the destruction of environment. Qualitative failure of sources will make a deduction in the capability or even impossibility of the effective operation of sources. Various types of human activities and manmade environments have interferential effects in the total phases of ecosystems leading them to harm, breakage and finally destruction. (Consulting engineers of east 1, 2006: 15) Therefore regardless of their abilities in reconstructing the nature after the formation of natural & human difficulties and also the consistency of nature against the destruction of its ecosystems,





nowadays humans do observe a vast destruction of natural landscapes which are generally caused by human. The elements like climatic changes & heat of the ground, unlimited operation of natural sources, human interferences in the ecosystems of forests, rivers, pastures and ... have provided the basis for the pollution of water sources, soil erosion and overthrow of plant & animal genetic sources of natural landscapes. Therefore maintenance of such landscapes, by creating a desirable balance among the attendance of humans and the ecological capacity of landscapes and suitable design with the ecological characteristics of the bed, is an inevitable and necessary manner. Access to designing patterns in the basis of maintaining natural landscapes involves the exact recognition of the ecologically distinct characteristics of the studied area and ecological evaluation of the landscape mosaic of that area. Such evaluations also involve the analysis of available structures, patterns and flows in the landscape mosaic. The results obtained from such evaluations, recognition of the existing changes in the form and rhythm of natural

patterns organizing landscape mosaic has made natural landscapes possible and provides the possibility to recognize natural difficulties (fire, wind, earthquake,...) and artificial (animal grazing, introducing new samples through human,...). To access such difficulties, organizing management plans at the protective level in the studied territories will be possible.

2-Ecological evaluation of the natural landscape of Fars MARGOON waterfall:

MARGOON waterfall is one the unique natural landscapes in Fars province that waters of KAMHAR River surprisingly flows on its rocks. The trees and river around the waterfall has created a beautiful and fabulous view; as though, such natural attractions in MARGOON site have created an opportunity so that more tourists can visit there. However, "tourism is one of the activities which have caused qualitative decline or even destruction." (Alizadeh, 2003:56) Natural landscape of MARGOON waterfall is also included.

Table 1: Consideration of weak & strong points, opportunities and threats of the natural site of MARGOON, source: Authors

Images of the natural landscapes of the bed	Threats	opportunities	Weak points	Strong points
MARGOON waterfall 	Lack of political & financial protection for the sake of developing strong management in the protective site of MARGOON Decreasing the water of the source Mixing house rubbishes with the water of rivers External threats such as sound, climatic & light pollutions	Creating attractive & oriented views for more existence of external & internal tourists in different seasons & hours Protection of the total spiritual, cultural, economic, ecological & social values of the bed and attempt in its development	Lack of educational, cultural, management plans to attract partnership of locals in protecting natural landscape of the waterfall Destruction of plant & animal homes of the bed because of unlimited aggression of tourists & locals to the natural territories of the region Environmental polluters in the vicinity of natural landscapes (Parking of vehicles, mineral water factory, ...)	Having natural views such as natural waterfall, gardens, farmlands, rivers, oak & DAGHDAGHAN trees Possibility of easy access of visitors to the natural site of MARGOON waterfall
Riverside trees 				
Gardens & farmlands 				
MARGOON River 				

3-Analyzing the structure & flows of the natural landscape of MARGOON waterfall:

The evaluation of natural landscape mosaic in MARGOON waterfall (Map No.1) shows that the landscape has a chain-like pattern from the open areas connecting together through vestibules in which MARGOON River follows a spiral pattern as the main vestibule. The existence of riverside trees with ribbon-like patterns and Zagros forests also with ribbon-like patterns forms a large part of the mosaic. Also most of the existing spots in the

landscape mosaic on the studied territory originate from human interference in its forming. Farmlands, fruit gardens, fish-raising pools & so on which have regular (often in the shape of a rectangle) or irregular patterns are the examples of such artificial spots. The form of the spots and vestibules and the type of their patterns have been mentioned in the table 2.

Map 1: The evaluation of natural landscape mosaic in MARGOON waterfall. Source: authors

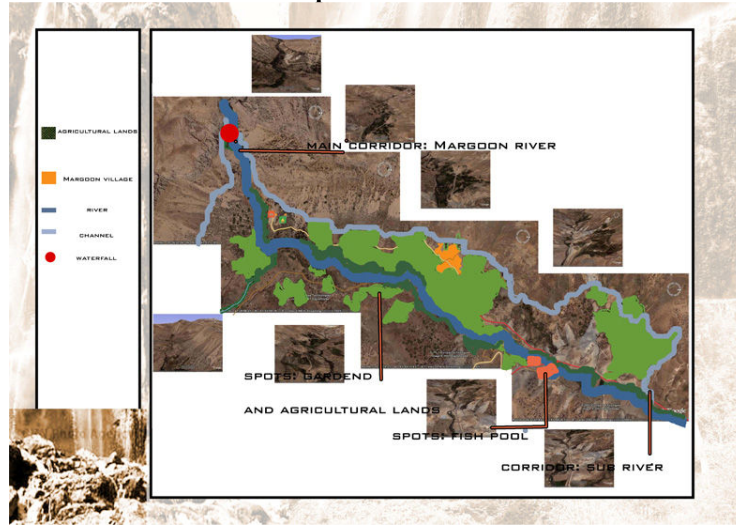
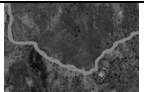




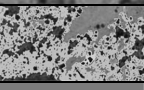



Table 2: The form of spots in Margoan landscape mosaic. Source: Ahmadi, 2009:71

Natural and artificial spots and vestibules	Pattern's type	Form
MARGOON River	Bolt pattern	
Gardens & farmlands	Model of integrated mass	
	Band pattern	
Riverside trees	Band pattern	
Zagros forests	The pattern of non-stop tape	
	Discrete mass model	
Aquaculture ponds	Rectangular pattern	

The structure of the landscape in the natural site of MARGOON waterfall specifies the following 3 types:

A) Areas of riverside trees which is located in MARGOON river valley with a steep more than 70%. This area consists of riverside trees, waterfall and MARGOON River and a large number of tourists exist there. The limits of the waterfall, having a rocky & steep surface is wet and slimy almost in the total year long. Plant cover of this area has been trampled by the constant existence of tourists and therefore superficial erosion is observed in this area. Also the life of fish and aquatics has been threatened by the disturbance of the natural balance of ecosystem which originates from dropping rubbishes into the water through tourists.

B) Forest zones, including the most part of the protective area of MARGOON, consist of the

areas with the steep of more than 50% and have sparse plant cover which has been mostly destroyed by human interference; therefore, the bed is being seriously eroded.

C) Grassy zones of the region have changed totally because of human interference, cutting trees, grazing of animals, developing gardens & farmlands and been replaced by vain grasses. Opoponax trees, wormseed, goat's-thorn, camel's thorn and various kinds of plants are obvious samples of grassy zone plants. Nakedness of the plant cover of this region has caused serious erosion in the soil of this bed. The important case is that in such landscapes "although its construction and forming is faster than forest landscape, more planning, preparing the site & exact management is required." (Behbahani & Shafee, 2003: 111). The ecological evaluation of the structures of natural landscape in MARGOON waterfall has been examined in table No.3.

Table 3: Ecological assessment of flow and structure of the natural landscape Margoön. Source: Ahmadi, 2009:74

	Water	Birds	Animals	Human	Aquatic
Zagros oak forest	Reducing water evaporation, prevent soil erosion, maintaining water	Move, hunt, nest building	Movement, reproduction, nutrition and other vital factors	Circulation, the use of shade trees in summer	No connection
Riverside tress	Prevent soil erosion	Nest building	Nutrition riverside plants, birds of prey living in the region	Circulation, the use of shade trees in summer	No connection
Agricultural Pasture	Irrigation	Nutrition	Required to provide animal fodder	Planting crops needed	No connection
Margoön river	Water Storage	Drinking water, moving aquatic prey	Hunting fish, drinking water	Recreation and outing (to enjoy the natural scenery Special)	The presence of some fish in the river
Margoön waterfall	Water Storage	Drinking water, moving aquatic prey	Hunting fish, drinking water	Recreation and outing (to enjoy the natural scenery Special)	Nutrition, live, move and perform other critical factors
Aquaculture ponds	Aquaculture (marine life recovery)	No connection	No connection	Feeding the fish grew	Aquaculture, food and other critical factors

4- Difficulties of the natural landscape of MARGOON waterfall:

"The difficulty is the main part of each ecosystem. The function of the ecosystem depends on the difficulty. Difficulty is also one of the main mechanisms of maintaining the variety of the

landscape." (Bell, 2003: 242) therefore the evaluation of the bed difficulties can reflex the effects of difficulties on the natural ecosystems and on the other hand makes the possibility to reconstruct destroyed landscapes.

The fulfilled researches on the studied territories show that natural & artificial difficulties (Originating from human interference) may carry several difficulties for the bed and lead to destruction. Such difficulties are as follows:

***Fire:** One of the available difficulties in the natural bed of MARGOON waterfall is the holocausts with the low measures which happen as a result of uncontrolled existence of the tourists and the lack of responsibility and their true perception of nature maintenance and natural sources. Making fire in the vicinity of riverside trees and plants by tourists has destroyed a large number of riverside trees. It's obvious that such holocausts (even in low measures) and the heats made by it has destroys the natural ecosystem of the region. This principle has caused that there be less ability for plant reconstruction.

***Erosion:** Riverside trees are used mostly for entertaining activities. Destroying the trees and using the woods for making fire by the tourists, using the woods for animal grazing and also the vicinity of heat and being exposed in high temperature has destroyed riverside trees. According to the point that the large part of the site has been located in MARGOON valley with a high steep and is only covered by the riverside trees, the destruction of the plant life has caused the erosion of the lands; as though, most of entertaining activities have been cancelled because of the weakness of the soil.

*** Environmental polluters:** environmental polluters play an important role in the destruction of the natural ecosystems of the regions. Dropping the rubbish into the water of MARGOON River by the tourists and local connections has made a serious danger for aquatics of the region and killed most of them.

*** Climate changes (Increase of temperature):** Hot weather of the region, decrease of raining, decrease of soil permittivity as a result of the destruction of plant life of the region has caused a significant decrease in the water of MARGOON River in comparison to the last years.

*** Hunting and Fishing:** Forbidden hunting and fishing in the protected region of MARGOON waterfall are of the most important elements which may destroy natural environments of the wild life in the region.

*** Unlimited grazing of animals:** Unlimited grazing of animals has made irreparable damages to the natural environments of the region.

5- Conclusion:

Unlimited access of human to the natural territories as a result of unlimited development of city dwelling and destroying views for the sake of agricultural consumptions, unlimited pollutions as the result of industrial and city rubbishes, climatic changes and destroying animal and plant life has led to the deduction of the proposed services by the environments and natural views. Therefore according to the fact that human has found the important principle including "destroying the nature will lead to the reduplication of social and economic structures and human life in long time" he is looking for a general outlook with the needs and limitations of nature so that he can determine the area of interferences and developments in the framework of the general outlook. The outlook of "Ecology" is one of the most general outlooks to the natural landscape which is looking for determining and recognizing available patterns and processes in organizing structures and progresses of the natural landscape. Therefore according to the mentioned issues and basic role of the natural landscape in controlling the quality and balance of natural ecosystems, regaining ecological values of the regions for the protection of related plant & animal areas is a necessary and inevitable manner.

Long time planning with supervision in executing the actions having been planned in advance is very important in completing a protective project of the natural landscape. The ideas are often created from the ecological needs of the designing bed and according to the fact that each natural landscape has its own unique identities and characteristics, various and different ideas will be proposed in the area of reconstructing natural landscape and in the direction of local characteristics of each region. At the first step, the elements and structure of the natural landscape must be researched by the

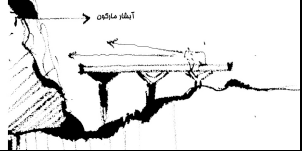

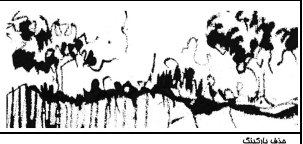

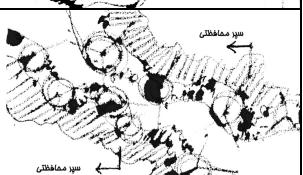
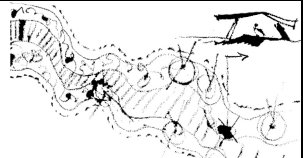
Ecological analysis of the natural landscape; then, natural and unnatural disturbances of the landscape will be examined because sometimes most landscapes will be affected and destroyed by

the interference of various disturbances. The reconstruction of such destroyed landscapes and replacing natural processes with human ones needs knowledge of the current disturbances of each bed.

The results taken from the ecological analysis of the natural landscape in the studied territory show that MARGOON River, as the main vestibule with a spiral pattern, have had an important role in forming the style of riverside trees. Therefore riverside trees in the edge of the river have developed in a border-like pattern. The existing separation in the trees of the region shows the

disturbances of the area. The disturbances which have happened by the existence of tourists, unsuitable acts with the environment like hunting, camping & ..., unlimited grazing of animals, unreasonable development of agricultural lands and fruit gardens with destroying riverside trees through locals. Therefore the protective suggestions in the studied region have been done for the sake of regaining ecological values of the bed coincided with the structure of the landscape mosaic and imitating natural act of each existing parts.

Table 4: Designing suggestions about the ecological protection and regaining of the natural landscape of MARGOON waterfall (source: Authors)

Protecting weak plant cover of the waterfall for which has been trampled by tourists with proposing a different access to MARGOON through designing visual platforms in a higher position than the ground	
Protecting wildlife environments of the region and developing the quality by providing the optimum conditions for laying eggs of aquatics and birds	
Total protection of the available waterways in the site out of the reach of tourists	
Covering ground surface with green trees and bushes to protect soil & water and avoid erosion	
Removing tourism parking from the riverside trees and transferring it out of the absolute protective territory to decrease environmental pollutions	
Creating protective fences around the riverside trees (absolute protective territory) by raising short bushes as though vision doesn't limit to those areas. It is better that the new spots do not separate from the riverside spots	
Absolute protection of the riverside trees territory by removing unsuitable entertaining actions like camping from the vicinity of natural territories of riverside trees	

Finally it must be mentioned that although we can not regain the last removed ecosystems by designing, we can design some new ones to help

the reconstruction of destroying ecosystems and at last lead to the regaining of ecological values of the region.

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1: The protective region of MARGOON waterfall is located in the west north of Fars province and 128 km to Shiraz between 30-31 north weight and 51-52 east length which has is about 10000 Hectares. This area has been called as the protective area according to the sanction 192 through the supreme council of environment in 1378.10.15. This area has a normal and cold climate with normal rains. It should be mentioned that the external spot of water is 2200 meter higher that the sea; as though, the highest height of the waterfall is about 60 meters. The height of MARGOON vale from which the waterfall flows is 117 meters. This waterfall is the origin of MARGOON River.

2: Fars province with 13 million hectares extent forms 7.5 percent of the entire area of Iran and has mountainous and fertile areas which are the continuance of Zagros heights. Such huge heights that become shorter to the eastwards have led to gradually & seriously climatic changes and a vast spectrum of plant & animal species in the different areas of Fars province.