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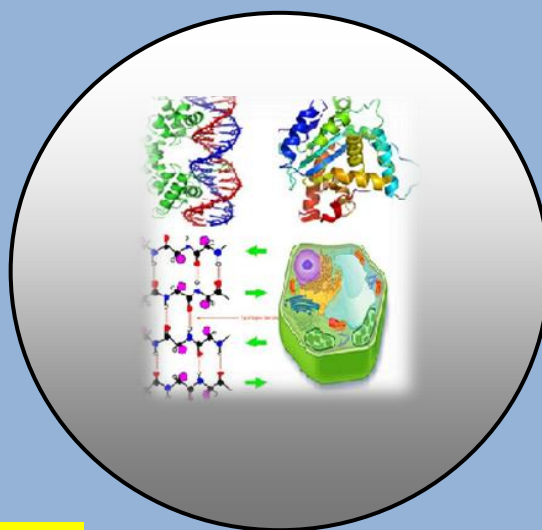
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## **Biological Quality Promotion of Isfahan City via Inner City Green Ways Establishment, Example Case: Isfahans Madies**

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### **ABSTRACT**

*Urban sprawl was with companion of development hierarchical substations. One of recent solving problems views concerns environment and in order city installations and green ways. Green ways substations formed nearly in (1860) A.C. in fact they're manifestation in the part of welfare and protective facilities, for ecological structure and service promotion to its users. The goal of this essay is function appointment and Mâdies performance in Isfahan as city green ways and presenting suitable technique for biological promotion and inner-city green ways establishment of Isfahan city. Research policy of this appeal is applied descriptive- analytic sort. To aim this appeal in two specific way documentary and open space (field) actions is taken to supply information to resolve and analysis the composition. In the end with expert surveys Delphi method utilization visual desirability of Isfahan Mâdies that possess necessity of green ways which means space connection, line structure, many-side possibility and analysis and evaluating connection of natural, artificial historical spaces of city and based on grids formation of green ways that presents for Isfahan city gradation quality.*

**Key words:** Green Way, Mâdies, Biological Quality and Stable Urban Expansion.

### **INTRODUCTION**

Development and expansion of Isfahan city to suburbs was with companion of development and expansion of grids and motion ways. This matter beside some other factor such as environmental concerns, unrolled city expansion caused space structure and historical structure harms and with the value of this city.

Regarding the strategic and outstanding situation of this city in the country with respect to historical, esthetic, financial and also actual condition of this city with the view of environmental crises and environmental quality some changes are obligatory for the sake of statuesque improvement and to control the changes in appear and establishment. One of these changes is the replacement of unengaged transportation facilities and improvement and utilization of existing potentials in this direction. Among them we can refer to existing Mâdis in this city that can be considered and studied as multi-purpose historical systems and in the fixed space frame work development and the transformation to ecological corridors.

This multi-purpose structure have the ability of transformation to inner city green ways grids and green trails for the environmental quality promotion purpose and dissolve present difficulties. Thus, first of all, the procedure of this appeal is to get through study and principle consideration and green ways recognition. Then with presentation and introduction of Mâdis and comparison between these two and then to represent and display some solution for Mâdi grids transformation to inner-city green way grids. In united states and European countries idea of green ways prevalence after appearing development resulting from abnormal urban area expansion and urbanism life and road grids development and as result of arising new attitudes in city planning and urban management. With attention to means complex relation and environs environment in form of multi performance systems and in stable environmental development framework. This matter was it the extent that nowadays mostly states that have independent management organization with title green ways and trails and also in Europe the European society formed in this direction. Also this appeal used the idea of green ways for Mâdis promotion in Isfahan.

**Appeal theoretical frame work:** concept of green ways. In America for the first time green ways movement set forth as the result of urban planning space and appearance planning and for the reason that there is no place to secure the different necessities of townsman people such as transportation, recreation and protection of environment needs and it became successful quickly with extra ordinary popularity. In fact first root of green ways obtained as result of talk between appearance and environmental planners base on necessity existence of some ecological structures with view of environmental sources and also non environmental sources to reach firm landscape conditions. On this basis first green ways in America is imputed to Fredrick Olmsted in the Emerald Necklace project at down town Boston. In Germany and with publication of Smith article about space planning in 1912. Regarding European community he proposed industrialization he proposed creating green space grids with intention of separating recreation residents and to improve quality of air.

Until now various definitions of green ways propounded the most important are described here:

- 1- Greenways are offered grid of line corridors that connect parks and green spaces to each other and they can be connector factor of parks to each other.
- 2- Greenways are green line space that comes in to existence along natural corridors like river fringe, or along a water canal or a good-looking road of an old rail way line.
- 3- Greenways are parts of green spaces and view planning or it is better to say that greenways taken into account as central pit of open space planning process. Green way is a systematic thinking to protect the ecological structure and functions.

According to Ahren openion greenways are systems and grids of protective lands for different applications such as environment protection, biological variety management to protect water sources and to protect historical and cultural sources and infect they're a kinds of strategic and space enjoyment and their main goal is land management with their sources and parts fixed in an incidental line corridors due attention to the definition and can come to an embracing and full definition about green ways.

Green ways are grids of connected elements and along passage line ways that are planned, designed and managed for multi-purpose goals. Purpose such as environmental, amusement, cultural, aesthetic and other goals that are suitable and well set for the concept of firm land use.

Green ways advantages and functions:

Variety function of green ways shows their acceptance and expansive development in city planning that are pointed to some of them in table (1).

**Table 1. Green Ways Functions and Advantages.**

Point of view	Advantages
Ecological	Creating stability in environment, establishment possibility and specific kind's emigration, wise safe guard of rare natural sources and ecosystems, keep biological variety to protect and establish balance in biorhythm. To create great specific parts, agreeable potential relief levels is suburbs landscape, to control the invasion of non-native kinds, to control erosion arranging rivers temperature, to create cohesion in environment. Connecting the ecological capacities and social opportunities.
City performances	Promoting quality of city environment, to establish connection. Protecting historical works, creating short cut lines and decreasing inner-city trips. Organizing construction activities, promoting river quality in upper and lower hand and to revivalist. Creating entertaining and amusing spaces. To increase per-head of green spaces.
Management	Green belt, limiting the expansion, controlling city pollution. to controls the damaging and destructing city nature, to control city traffic.
Economic	To increase the added value, expanding the tourist, make business and commercial opportunities.
social	Increasing social interactional, creating the sense and group working field. To have educational aspects in relation to nature to create motion, to increase society health level

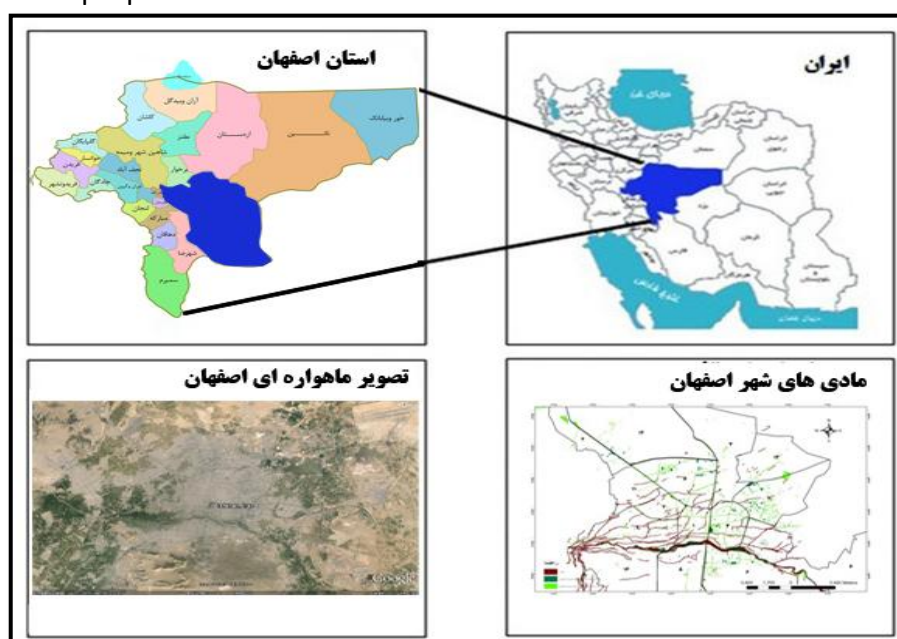
### Concept of Mâdi and its characteristics

Divider streams of Zayandehroud River are called Mâdi. Mâdies like subterranean water can alerted master piece thought of desert living man. If we consider Zayandehroud River the jugular vein of Isfahan then Mâdies are the arteries that are divided from this jugular vein and speeded in abdomen of the city. What is certain is the first performance and the consideration of utilization the flood gate share of Zayanderoud river.

In fact Mâdies were made in the past with the purpose that they could take branches of Zayanderoud River and profited in irrigating agricultural land and villages that exist in the city. Based on the Sheikh Bahae scroll allocating quotas has to place that in fact with opening and closing of Mâdies could arrange the existence and entrance of water and irrigating the lands. Although after Mâdies construction later on another performance comes in to being for Mâdies but at the beginning the manufactures goal of constructing this spaces is just the transferring and arranging water after constructing other profits of Mâdies and advantages came in to being for them in the manner that could say nowadays Mâdies are one of the most important elements of this city.

Regarding to what's said the most important characteristics of Mâdies are as follow:

- 1- they are taken into account as historical spaces with attention to historical antecedent it's said that number of people consider the creation of Mâdies to the time of Ardehshir Baabakan that about 1700 years ago. So Mâdies are historically rich.
- 2- They are line elements.
- 3- That is cause of connection of historical and old parts of the city.
- 4- they are charged as motion lines sometimes related structural features and sometimes allocated to all kinds of motion.
- 5- It contains various biological kinds such as animals and plants.
- 6- They are public spaces that fulfill their parts on the quarter's scales.
- 7- From beginning of their arising they affected process of people life. Nowadays also with performance changes they continue their affecting more than before.
- 8- They allocate main parts of Isfahan's traffic grids to themselves.
- 9- They affect the increase of green space per-head.
- 10- They have conformity with firm development principle.
- 11- They are effective in improvement of city appearance.
- 12- They are low-abiding.
- 13- They are expanded in the city by grid form.
- 14- They are multi- purposes.



Photos of Isfahan's Mâdies

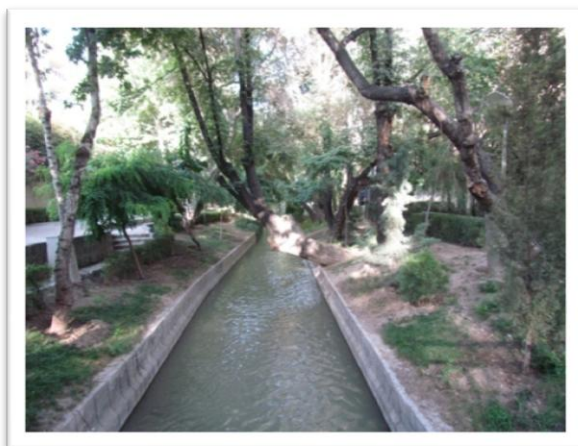
### Case study

Isfahan city is one of the oldest cities in central platen of Iran. That have rich historical and cultural spaces and elements for the purpose of city form planning. Because of structural and climate condition of its time. One of this spaces that remained from far times is Zayandehroud and its resulted Mâdies.

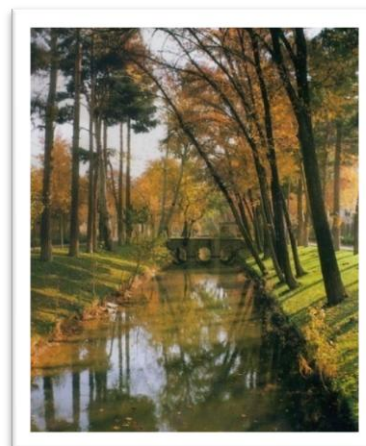
Different height of Zayanderoud river-bed with neighboring lands is not much in this city so that dividing streams from rivers to branches is possible and in different period of time some streams have been separated from this river that idiom tidy are called Mâdi. Here comes below images and maps of Isfahan Mâdies and streams.

#### Position of case study

**Isfahan**



**Iran**



**Satellite image of Isfahan**

### Search method

Purpose of this research is the presentation of suitable techniques for promoting biological quality in Isfahan city by creating inner-city green ways. In the form of descriptive-analytic studies and it came to certain by help of Delphi method. In researches that are relevant to planning, Delphi method is charged as a new method. Regarding lack of a final method for fixing and choosing research ingredients and lacked of statistical basis for concussions could present a stage methodology to accomplish the research. The purpose of using the Delphi research method is to obtain identification assurance of related experts. And to give them opportunity of participation in research.

The Delphi research method is not related to statistical sample that recommends society. Delphi is a group mechanism decision that requires worthy experts participation with deep understanding of the subject. Thus one of most important necessities is the choose of worthy experts. First of all the experts are divided into two groups, the academic authorities and experts in planning matters and city management in form of 18 people. In this research a multi-stage approach is used to identify the experts.

Step1-to provide work-sheet of candidates knowledge sources.

Step2-to fill the work-sheet with names.

Step3-first round of contacts is to candidate other experts.

Step4-to rank the experts based on their characteristics.

Step5-to invite experts to research.

**Table 2. Benefits and Advantages of Madies in Isfahan City.**

Function and performance	Function's fulfills method.
City expansion guidance	In the time of safari with the expansion of city form toward south and west, farm lands around old city and Mâdies gradually became parts of city and little by little new quarters formed in the bed of gardens and Mâdies.
To prevent flood occurring	Regarding that the superficial water flowing and stream descending were always toward Zayanderoud river Mâdi slope considered always toward low-lands are effective in crisis management.
Producing architectural forms	Mâdies with different style and manner have interaction with buildings in their way so that this Mâdies are even pulled into some of new public historical buildings and amalgamated in inner-yard of these buildings.
To refine the city air	Water flowing in this streams and green spaces compression about this streams causes and ever while less temperature in this spaces than other parts in creates more pleasant environment (atmosphere).
To boost subterranean water spread	Mâdies with removing water to far distances beside river in the lands and fields increases the water level of this subterranean and boosts this water spreads.
Job creation	Mâdies by creating responsibility in past and creating jobs, organizations, institutions and forming professional committees and allocating organization unit's related department nowadays are effective in job creation.
Economic profit	To utilize the water of Mâdies in past and making use of constructive elements effects in decreasing the adjacent usages of power use are effective in increasing economic efficiency.
Causing traffic to flow	To do this structure, as short cut lines between main streets and observing the trip by these streets causes the flowing of traffic.
To increase hiking feeling	Mâdies special structure and their existing plant coating by creating pleasant spaces in a factor in persuading citizens to hiking and to use bicycle.
Creating the sense of belonging to around spaces	Mâdies in the quarter's surface are similar to river in the city surface with smaller measure that causes the sense of belonging and even given name to the quarters by the Mâdies that flows in them.
To create city hang out spaces	Attendance of people in different occasions beside Mâdies in the past and in less level compared to past resident's attendance neighboring the Mâdies and in the limits of Mâdies are effective in creating halting and social spaces.
To prevent water to becomes useless	Achieving this is by way of reaching water with less useless to use place and to environment the subterranean water and to gather the surface water flowing.

**Table 3. Huge Strategies and Techniques Obtained from Search Result.**

Strategies	Techniques
Development techniques	Study and planning for reconstruction of streams rein-tip dredging the planning, to study obstructions and obstacles along the Mâdi lines and planning for line reconstruction, preserving and sketching for water course bridge, rim construction sketching and side slopes correcting, recognition and preserving repair and correcting green passages and sidewalk and road way in the way of Mâdies, to study the facts of passing different foundations like( water, gas, ...) in the Mâdies length and width, choosing a manner in entrance of bridges, roadways and in the intersection place of stream with main passages, taking action to build stand still little pool for sediment etching, to observe topography in sketching the rim.
Ecological and green space techniques	Protecting margin green spaces of streams, to plant young trees and tree in courses that lack's tree identifying natural and artificial linear elements in the site limit and planning to use them, connecting cultural and ecological sources and green spaces in site limit, sketching motion lines for pedestrian around the stream in the manner to have sight and view in addition it not cause any destruction for green spaces around it, to create suitable biological conditions for development and growth of trees in the margin of stream and to prevent shedding any kind of building materials in the rings of trees and also to predict new trees in suitable spaces and conditions.
Management techniques	Preserving related matters to releasing the Mâdies legal limits, supervising the stream limits to prevent creation of bridges in inadmissible way and other offending, forming specialized committees including experts related to connection with Mâdies to take into consideration the encouragement benefits to the owners next to the Mâdies along side of looking after Mâdies next to them, establishing volunteer people group for controlling directors work for creating project, to manage the edge of Mâdies from residential building view and to create enough space at the limb. Providing water sources suitable for irrigating green spaces around the streams, studding and offering budget for streams organizing.
Social techniques	To create affirmative and group spaces around the Mâdies, separating different roads and defining different lines for usage next to the site, performing special amusing, cultural ceremonies next to Mâdies for the sake of returning the life to these spaces creating possibilities to do public sports, creating town spaces in the weave of quarters with consideration of the geographical position of each Mâdi in city area.
Economic techniques	To create job opportunities in site limit, to increase tourist industry in the limit, to make lines available to stop along Mâdies lines, to make facilities such as shelter, drinking fountain, dwelling places and.... Emphasis on Mâdies as one of owner's properties.
Pleasure and amusement	Create bicycle, ride lines beside the hiking lines to create safe lines, to create pleasure facilities, creating and preparing short stop and picnic possibilities, to provide suitable light grid around streams.



### Method performance

In this research Delphi method investigation the weight giving kind or serious kind is used for questionnaires performance. This method includes three total step:

- 1- Thought floods for the purpose of appointing components.
- 2- To limit original list to most important cases.
- 3- Scoring and appointing the priority of harmony balance of suitable techniques for promoting biological quality of Isfahan city by creating inner-city green ways.

### Finding

In this research Delphi method research are used for role fixing and performances of Isfahan's Mâdies as city green ways. And to present suitable technique for promoting biological quality of Isfahan city by creating inner-city green ways. The obtained result of analyzing and assimilation is as follow. The most important benefits fulfillment of Mâdies in Isfahan city is presented briefly in table 2.

With intention to perform the idea of green space and green ways in the form of Mâdies must to take action for the sake of omitting or removing the obstacles. In this direction most important proposed methods are presented in table 3. With the intention of reforming the inappropriate present conditions.

### CONCLUSION

Green ways with creation of special characteristic in the study area could be effective in ecological quality of the city and also visual quality and esthetics aspects of the environment and consequently increase s or decreases the feeling of protection belonging to the environment in the view of the citizens. It also plays role in promoting quality of citizen's life in economical, cultural, pleasure, environmental, health and security dimensions.

Mâdies of Isfahan for purpose of form are charged as strategic points, this city and also form antiquity view have higher antecedent of most historical works of this city and now because of ecological crisis's which the most important of them is the dynes of Zayandehroud river's water and the cutting water flowing of Mâdies are on the threshold of annihilating and in need of revival and keeping.

More over regarding all the potential of this structure in transferring to green ways and also the existence of structure and performance similarities between Mâdies and greenways. Best solution for revival of this structures and their life returning are as the result of promoting the biological quality of Isfahan city green ways and How much we could introduce Mâdies of Isfahan as the first generation of city green ways in the world.

### ACKNOWLEDGEMENTS

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