

Application of environmental justice concept in urban planning, the peri-urban environment of Tehran as the case study

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Abstract

Environmental Justice (EJ) concept consists of multifaceted movements, community struggles, and discourses in contemporary societies that seek to reduce environmental risks, increase environmental protections, and generally reduce environmental inequalities suffered by minority and poor communities; a term that incorporates 'environmental racism' and 'environmental classism,' captures the idea that different racial and socioeconomic groups experience differential access to environmental quality. This article explores environmental justice as an urban phenomenon in urban planning and applies it in peri-urban environment of a metropolis.

Tehran peri-urban environments which are the result of meeting the city- village- nature systems or "city-village junction" have gradually faced effects such as accelerated environmental decline, changes without land-use plan, and severe service deficiencies. These problems are instances of environmental injustice which make the planners to adjust the problems and use and apply the appropriate strategies and policies by looking for solutions and resorting to theories, techniques and methods related to environmental justice.

In order to access to this goal, try to define environmental justice through justice and determining environmental justice indices to analysis environmental injustice in case study. Then, make an effort to introduce some criteria to select case study in two micro and macro levels. Qiyamdasht town as the peri-urban environment of Tehran metropolis is chosen and examined to show the existence of environmental injustice by questionnaire analysis and SPSS software. Finally, use AIDA technique to design a strategic plan and reduce environmental injustice in case study by introducing the better scenario to be used in policy- and decision-making areas.

Keywords: *Environmental justice, Procedural justice, Distributive justice, Urban planning, Peri-urban environments, Metropolis of Tehran, Qiyam-Dasht peri-urban settlement, Analysis of interconnected decision area (AIDA).*

1. Introduction

Living in satisfying urban environments is important for an individual's well-being. In order to create such environments, planners, designers, and policy makers need to understand the structures that cause residents to feel satisfied with their environments (Shieh, Sharifi, Rafieian, 2011). Urban planning evolved throughout the twentieth century, leading to a great variety of urban forms, which often had little regard for their impact upon the environment (Daneshpour, Shakibamanesh, 2011).

Nowadays most problems stemming from possible environmental losses and risks; violations of primary human rights caused by environmental factors; limited access to benefits, capital investments or natural resources;

limited access to information, limited participation in decision-making, or lack of access to justice have occurred in Tehran and especially its surrounding environments in various forms in macro and micro levels. Due to the presence of people from different ethnic groups with different levels of income each of whom is forced to live in these environments for a particular reason, Tehran peri-urban environments are taken into consideration by urban planners whose first mission in planning is the fair allocation of resources to benefit the society as a whole rather than specific income or ethnic groups.

However, Tehran peri-urban environments which are the result of meeting the city- village- nature systems or "city-village junction" have gradually faced effects such as accelerated environmental decline, changes without land-use plan, and severe service deficiencies. These problems are instances of environmental injustice which make the planners to adjust the problems and use and apply the appropriate strategies and policies by looking for solutions and resorting to theories, techniques and methods related to environmental justice. To resolve the problem, in this

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research the concept of the environmental justice is taken as a phenomenon in urban planning and as a case study in peri-urban environments affected by the metropolitan expansion of Tehran. To achieve this priority, this research follows three macro steps.

In the first step, the theoretical frameworks related to the environmental and peri-urban environmental justice are introduced and described separately. Then, by combining these frameworks and extracting the workable principles in the case study, it is attempted to introduce the process of obtaining environmental justice in urban and peri-urban environments.

In the second step, considering the measurements, factors and indicators of environmental justice, the case study is selected in both macro and micro levels and its spatial features are described through physical-activity method. To pursue the thesis hypothesis proposing lack of environmental justice in Qiyam-Dasht peri-urban settlement located in District 15 of Tehran, a questionnaire was designed and completed and the gathered data were analyzed; the results obtained from studying the spatial features of the case study and the position of the concept of the environmental justice in the previous plans helps to prove the hypothesis which proposes the lack of environmental justice in the case study.

Finally and in the third step, applying the problems and purposes arising from studying the spatial features of Qiyam-Dasht peri-urban settlement, the previous plans are studied and the data obtained from the final statement of the problems and purposes questionnaire are analyzed. In order to plan for this settlement, applying the Analysis of Interconnected Decision Area (AIDA), the best scenario to be used in policy- and decision-making areas to provide a plan for future development and changes for this settlement is introduced.

2. Defining Environmental Justice Through Justice

What, exactly, is the 'justice' of environmental justice? What do activists and movements mean when they employ the term? Activists and academics within the environmental justice movement have been discussing the meaning of justice for two decades. For years, justice studies were defined by, and proceeded from, the theories of John Rawls. They focused on a conception of justice defined solely as the distribution of goods in a society, and the best principles by which to distribute those goods. This research has no criticism of justice conceived in distributional terms like this; not only does such an approach make sense theoretically, but, importantly, many social movements also defined justice in terms of what their constituents got-and did not get-in a given society. The problem is not that distributive theories of justice can-

not be applied to environmental justice. Rather, the issue is that justice theory has developed a number of additional ways of understanding the processes of justice and injustice - and these developments have rarely appeared in the literature on the environmental justice movement.

Authors such as Iris Young, Nancy Fraser, and Axel Honneth argue that while justice must be concerned with classic issues of distribution, it must also address the processes that construct maldistribution; they focus on individual and social recognition as key elements of attaining justice. Central here is not only the psychological component of recognition, but also the status of those less well-off in distributional schemes. In addition, Amartya Sen and Martha Nussbaum have developed a theory of justice that focuses on the capacities necessary for individuals to fully function in their chosen lives. The focus is not just on the distribution of goods, but also more particularly on how those goods are transformed into the flourishing of individuals and communities. The approach gives ethical significance to this functioning and flourishing, and finds harm—injustice in fact—in the limiting of them. Capabilities theory examines what is needed to transform primary goods (if they are available) into a fully functioning life—and what it is that interrupts that process. In addition, contemporary theories of justice also often have a component of procedural or participatory justice. For Fraser, participation is the third leg of a triad that also includes distribution and recognition; for both Sen and Nussbaum, participation is a key political capability, necessary for individuals to ensure functioning. In essence, many contemporary theories of justice refer to a standpoint that is broader than just how things are distributed. This standpoint includes our intuitions and theories about recognition, participation, and the way people function—they also relate as much to groups as to individuals. Yet for all of these developments in justice theory, very little has been applied to the environmental justice movement. Most discussions of environmental justice focus on maldistribution - the fact that poor communities, indigenous communities, and communities of color get fewer environmental goods, more environmental bads, and less environmental protection. Some examiners of the movement and the concept of environmental justice have emphasized the importance of procedural justice and participation (Lake 1996; Shrader-Frechette 2002). And a number have focused on issues of recognition, while not directly referring to the theoretical literature; these examine the cultural and racial barriers to individuals and communities getting a just distribution (Pulido 1996 and most of Bullard's work). However, there has been no thorough and comprehensive exploration of environmental justice movements with the goal of examining the conceptions and discourses of justice that they use (Schlosberg, 2007) (Table 1).

Table 1 Different kind of justice definitions

	Justice	Definition
Social	Distributive	The enforcement of the equal protection of the law or pollution preventions strategies so that pollutions will not be distributive to any community.
	Recognition	focus on individual and social recognition as key elements of attaining justice
	Capacity and capability	Focuses on the capacities necessary for individuals to fully function in their chosen lives and more particularly on how those goods are transformed into the flourishing of individuals and communities.
	Procedural	Concerns the fairness and the transparency of the processes by which decisions are made.
	Social equity	Equal opportunity in accesses to benefits.
	Economic equity	The concept or idea of fairness in economics, particularly as to taxation or welfare economics. More specifically it may refer to equal life chances regardless of identity, to provide all citizens with a basic and equal minimum of income/goods/services or to increase funds and commitment for redistribution.
	Environmental equity	The situation in which environmental risks and benefits among all groups of people are approximately comparable.
	Environmental inequality	a geographic reality, a pattern in which hazardous waste sites, polluting industries, nuclear waste dumps, and other environmental threats are more likely to be located within or adjacent to communities of colour or poor communities.
	Spatial inequity	The unequal amounts or qualities of resources and services depending on the area or location, such as medical or welfare.
	Ecological	Focused on the relationship between those human communities and the rest of the natural world.

The argument here is that movements use a wide range of conceptions of justice, and we can find arguments in those movements for distribution, recognition, participation, and capabilities. The environmental justice movement supplies ample evidence that all of these conceptions of justice are used in practice, and that, in fact, a comprehensive understanding of the way these movements define the 'justice' of environmental justice must include all of these discourses.

To some, environmental justice is a social cause that promotes fairness and equity for all people. To others, it is a set of federal and state policies that must be followed to ensure agency compliance with federal civil rights laws, especially Title VI (Shrader-Frechette, 2002). Still others may view environmental justice as a possible roadblock to planning and project development that must be

overcome in situations when local activist groups use the planning process to promote a specific agenda. In reality, environmental justice involves each of these perspectives to a certain degree. In this research, environmental justice is defined as "the fair treatment of all people in terms of the distribution of benefits and costs arising from planning projects, programs, and policies." The term "fair" means that a disproportionate share of adverse effects will not fall upon low-income or minority (protected) populations. A disproportionate share of adverse effects in turn implies that the distribution of benefits to a protected population is not commensurate with the costs that this particular population would bear. It is important to keep in mind that the value of a benefit or the adversity of a cost may vary among population groups (table 2).

Table 2 Perspectives on environmental justice

Perspective	Definition
Environmental justice as a policy	The United States Environmental Protection Agency's definition of environmental justice stresses the concepts of fairness and equity in a regulatory framework: Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
Environmental justice as a social movement combining concerns of social justice and environmentalism	A definition used by many environmental justice proponents stresses the comprehensive array of environmental justice concerns involving both physical and human environments: Environmental justice is the right to a safe, healthy, productive, and sustainable environment for all, where "environment" is considered in its totality to include the ecological (biological), physical (natural and built), social, political, aesthetic, and economic environments. Environmental justice refers to the conditions in which such a right can be freely exercised, whereby individual and group identities, needs, and dignities are preserved, fulfilled, and respected in a way that provides for self-actualization and personal and community empowerment
Environmental justice as a call for equal access to the decision making process	Another commonly used definition focuses more on environmental laws and environmental protection, calling for equal justice, equal protection, and equal access to the decision making process: Environmental justice has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity,

and/or socioeconomic status. This concept applies to governmental actions at all levels local, state and federal as well as private industry activities

The debate concerning research methodology is among the most controversial in the environmental justice debate. This debate touches on some of the fundamental questions regarding scientific inquiry. This study examines an integrated analytical framework for environmental justice analysis. This framework unifies various perspectives that will be presented in subsequent section and provides a bird's eye view of environmental justice analysis.

3. Methodology and Analytical Framework for Environmental Justice Analysis

3.1. Principles of environmental justice

Environmental justice principles are extracted from theoretical framework of environmental justice and equity. These principles are provided in order to produce an equal environment for all people. An environment where all people involves regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. These principles are followed in three kind of equity.

3.1.1. Socio – economic equity principle

Environmental justice is the basic right of political, economic, cultural and environmental stresses autonomous people. Environmental justice calls for is right where all the

workers in a healthy and safe working environment away from having to choose between a life of insecurity and unemployment, work. Environmental justice demands that the right people in the environmental hazards are away from home to work.

3.1.2. Ecological equity principle

Environmental justice calls for is right where applicable ethical, balanced and responsible land and renewable resources it might be possible to provide a stable environment for all people.

Environmental Justice on need for urban and rural ecological policies to clean and rebuild the cities and rural areas in balance with nature is emphasized, so that the cultural integrity of all communities and equal access to resources should be respected.

3.1.3. Procedural equity principle

Environmental justice demands that public policy based on mutual respect and justice for all people is to get away from discrimination and bias.

An environmental justice demand for the right to participate at every level of decision-making process includes assessment, planning, implementation and evaluation is needed.

Table 3 Factors to consider in environmental justice analysis

Category	Factors	Variables
Potential exposure and risk	Demographic	-Race, ethnicity, income, age, gender, disability
		-Susceptible and highly exposed populations
	Geographic	-Population density
		-Population literacy
Economic	-Population/economic growth	
	-Climate	
Human health and risk	Geographic	-Land use/land cover
		-Topographic and geomorphic features
	Economic	-Hydrologic features
		<i>Individual Economic Conditions</i>
	Human health and risk	-Income level/health care access
		-Infrastructure conditions such as water and sewage
		-Life-support resources such as subsistence living situations
		-Distribution of costs to pay for environmental projects by user fees for necessary goods and services
		<i>Community Economic Base</i>
		-Industrial
Human health and risk	-Brownfields	
	-Natural resources	
	-Proximity to environmentally risky facilities	
	-Public perception of risks	
Human health and risk	Human health and risk	-Toxics, pollutants, and pesticides
		-Emission sources, amount and distribution
	-Ambient concentrations and their distribution	
	-Exposures: locations, multiple, cumulative, synergistic	
	-Health status and effects	

Cultural and ethnic differences and communications concerns

- Research gaps (e.g., subsistence consumption, dietary effects)
- Data collection/analysis reliability and validity
- Public access to the decision-making process
- Cultural expectations and understanding of the decision-making process
- Meaningful information about risk assessment and management
- Job security
- Literacy rate for consideration in choosing the right communication materials
- Translations for non-English speaking audience
- Community representation
- Community identification
- Industrial concentration
- Inconsistent standards in enforcement and site selection
- Research gaps
- Program gaps
- Non-inclusive processes
- Past practices
- Cultural diversity
- Obligations

Historical and policy issues

Source: U.S. EPA, Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses, Washington, D.C. 1998b. Available at: <http://es.epa.gov/oeca/ofa/ejepa.html>, October 15, 1998. According to Liu, Feng, 2000

3.2. Indices of environmental justice

Criteria and variables must be considered in the analysis of environmental justice. In each of these criteria classified based on the relevant factors to be offered (Table 3).

3.3. process of environmental justice

Applying environmental justice in urban planning should become as a process in order to help planner in attaining to this aim. The levels of attaining to environmental justice have explained completely schematic in 4 steps. These steps depict, from the beginning, the incidence of inequality in the environment to achieve environmental justice and equality (fig 1).

The top level of the hierarchy identifies the process of concern as the formation of environmental inequities. The second lower level of the hierarchy indicates that rather than being a simple "perpetrator-victim" interaction, the formation of environmental inequity results from the interactions of multiple stakeholders and is based on either environmental racism or a resulting environmental inequity. Environmental justice is the positive outcome and opposite of either environmental racism or injustice. The third or lowest level components of the hierarchy describe more fully the nature of the middle level phenomena. For example, the kinds of stakeholders or the sources of inequity are identified. Note that this framework adds amenities along with burdens as potentially inequitably allocated aspects of environmental quality (see, e.g., Boone 2002). Spatial information on distributive injustice is likely to apply to understanding environmental inequity. Similarly, spatial methods and data can help evaluate the attainment of environmental justice. At the bottom of the diagram, the components of the framework are identified as to whether they contribute to negotiations that establish environmental conditions, identification of the problem of differential allocation of environmental benefits and hazards among groups, or solutions to differential allocation.

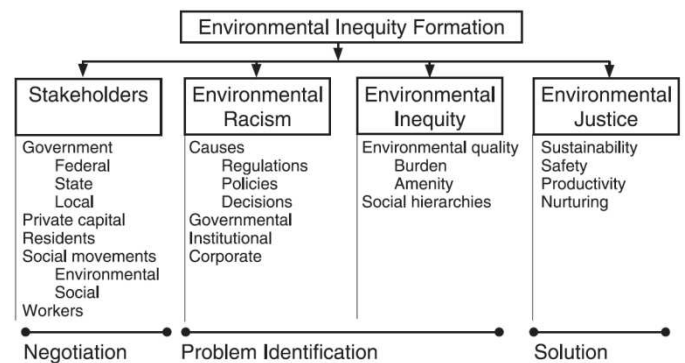


Fig 1. A diagrammatic framework for a theory of environmental injustice based on Pellow (2000). The schematic, hierarchical form parallels that used for spatial theories (e.g., Cadenasso et al. 2003)

4. The Peri-Urban Environment of Tehran as the Case Study

Tehran peri-urban environments which are the result of meeting the city- village- nature systems or "city-village junction" have gradually faced effects such as accelerated environmental decline, changes without land-use plan, and severe service deficiencies. These problems are instances of environmental injustice which make the planners to adjust the problems and use and apply the appropriate strategies and policies by looking for solutions and resorting to theories, techniques and methods related to environmental justice.

In this part, considering the measurements, factors and indicators of environmental justice, the case study is selected in both macro and micro levels and its spatial features are described through physical-activity method. To pursue the thesis hypothesis proposing lack of environmental justice in Qiyam-Dasht peri-urban settlement located in District 15 of Tehran, a questionnaire was designed and completed and the gathered data were analysed; the results obtained from studying the spatial features of the case study and the position of the concept of the environmental justice in the previous plans helps to prove the hypothesis which proposes the lack of environmental justice in the case study (fig 2).

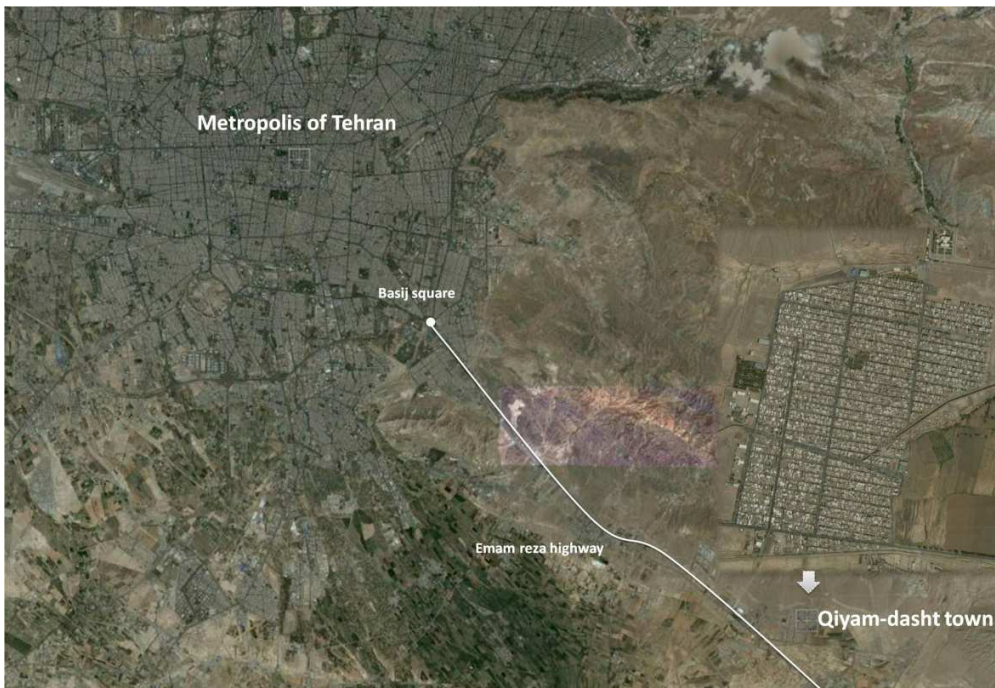


Fig. 2 Qiyam-Dasht town as a peri-urban environment of Tehran

4.1. Detection of the research hypothesis

In this research in order to pursue the thesis hypothesis proposing lack of environmental justice in Qiyam-Dasht peri-urban settlement, a questionnaire was designed and completed and the gathered data were analysed. According to

the scale of variables measurement, Pierson test and t-test are used in SPSS software. These tests are done base on two categorise of descriptive findings resulted questionnaire and spatial findings resulted maps and statistic data:

First: testing descriptive and spatial findings of personal-social attributes such as occupation, gender, age, etc.(table.4, 5).

Table 4 Pierson test, relationship between age and e.j

Dependent variable		Cognition of E.J
Independent variable		
Age	Correlation coefficient	0.183
	Significance	0.000
	NO.	136

Table 5 T-test, the mean comparison of exposure to environmental injustice with regard to occupation and gender

Variable	Amount of (t)	significance	difference
occupation	5.012	0.000	2.466
Gender	4.038	0.021	1.400

Table 6 Environmental justice indicators measurement with single-sample t-test

Indices of measuring Ej	T – test scale (3)					
	t -statistic	Degree of freedom	Significance	Mean difference	Confidence interval Lower bound	Upper bound
Access to health care	-11.63	99	0.00	-1.08	-1.26	-0.9
Access to educational services	-9.954	99	0.00	-1.02	-1.22	-0.82
Access to sports services	-12.791	99	0.00	-1.21	-1.40	-1.02
Access to daily shopping	-6.439	99	0.00	0.00	-0.92	-0.48
Access to non-daily shopping	-23.415	99	0.00	0.00	-1.7	-1.44
Access to Banks and Financial Institutions and Funds	-9.757	99	0.00	0.00	-0.80	-1.20
Access to offices	-21.557	99	0.00	0.00	-1.71	-1.43
Satisfaction with access to parks and green spaces	-11.515	99	0.00	0.00	-1.35	-0.95
Access to cultural centers	-32.474	99	0.00	0.00	-1.86	-1.64
Access to public transport	-6.888	99	0.00	0.00	-1.09	-0.61
Pedestrian access	-6.932	99	0.00	0.00	-1.02	-0.56
Environmental Health	-32.474	99	0.00	0.00	-1.86	-1.64
Relationships between different	-1.468	99	0.145	-0.18	-0.42	0.06

social groups						
Habitat satisfaction	-0.349	99	0.728	-0.40	-0.27	0.19
Activities of institutions and decision-make	-12.430	99	0.017	-0.25	-0.45	-0.05

Second: testing descriptive and spatial findings of social and procedural equity indices such as accessibility to welfare, accessibility to transportation, relationship of social groups, participation in decision-making process, etc.

The results of this method prove the existence of environmental of injustice in case study (Table. 6).

4.2. Codification of planning problems and goals statement in order to promote environmental justice in peri-urban environment of Qiyam-Dasht

Specifying factors and indices affecting on environmental justice, resulted subjective and objective factors analysing in peri-urban environment of Qiyam-Dasht, the environmental injustice problems statement of case study is produced. Accordingly, the goals statement presented in order to apply in designing program to promote Ej in case study.

Due to environmental justice principles extracted literature, problems and goals are listed and appropriate indices are assigned (Table. 7).

4.4. Designing program to promote Ej in case study

In order to plan for this settlement, applying the Analysis of Interconnected Decision Area (AIDA), the best scenario to be used in policy- and decision-making areas to provide a plan for future development and changes for this settlement is introduced. Procedural equity, ecological equity, economic equity and social equity are determined as decision areas and the compatibility and incompatibility of these areas are analysed (Table. 7). Alternative scenarios are produce by scenario matrix (fig.3). Finally the selected scenario is introduced by assessment all scenario (Table 8). The elected scenario consists of four options:

- First-Increased attention to this settlement deal with the authorities,
- Second - Increase in environmental health
- Third – Create new job opportunities
- Fourth- Development of utilities in the case study

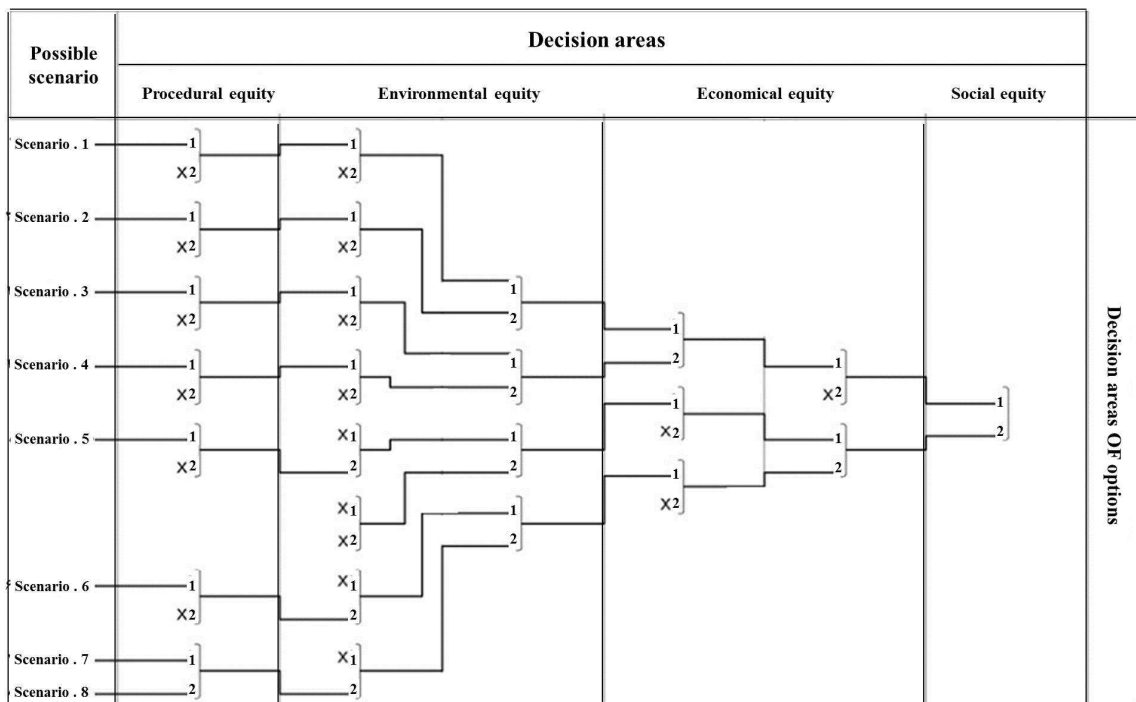


Fig. 3 The Tree of creation alternative scenarios in order to enhance environmental justice in the peri-urban environment of Qiyam-Dasht

Table 7 Problems and goals statement in order to promote environmental justice in peri-urban environment of Qiyam-Dasht

Principle	index	Problem	Goal
Procedural equity	Equity in encountering with planning of case environment by urban authority	urban management Inequity of region 15 about considering and handling of case study	equity in considering and handling of case study by urban management of region 15
	Meaningful involvement in decision-making process	Discrimination in participation and meaningful involvement of residents in decision-making process	participation and meaningful involvement of residents in decision-making process Regardless of race, income level, etc.
	Decision-taker agent tendency to participation in affairs	Less work and attention of residents to participation in programs and projects for commuter nature of case study and lack of residents knowledge due to the low level of literacy	Increasing tendency and attention of residents to participation in programs and projects

Environmental equity	Water quality	Very low quality of drinking water leading to daily water drinking shopping and a charge for non-potable water equal to other water users in Tehran using drinking water	Increasing the quality of drinking water and appropriate water costs due to the non-potable water
	Landscape quality	Visual pollution caused by the lack of monitoring building and producing unfavorable façade and enforcing inefficient facilities	Increasing construction monitoring and implementing efficient facilities
	Air quality	Air pollution due to neighboring to factories and polluting industries	Increasing air quality and dealing seriously with agents of producing Contaminants
	Exposing natural hazards	Seasonal flood risk of Northern lands of case study	Decreasing Seasonal flood risk of Northern lands of case study and Increasing safety against it
	Environmental cleanliness	Proximity to seismically active faults and very low resistance of buildings against this risk	Increasing safety against earthquake risk
Economical equity	Occupation	Unpleasant odor from the open channel eastern edge of case study	Covering the open channel eastern edge of case study
	Income	Pollution from domestic sewage flowing in the streets	contriving sewage system
	Level of literacy	Lack of appropriate job opportunities	Increasing appropriate job opportunities
Social equity	Welfare quality	Low wages	Increasing investment in case study in order to increase the income level
	Quality and condition of accessibility to public transport	Low level of literacy in case study	Increasing awareness of resident about procedure of plan in case study
	Equal accessibility of Different ethnic and racial groups to welfare	Low level of welfare quality such as: cultural, Spending leisure time, sportive and therapeutic	Increasing level of welfare quality such as: cultural, Spending leisure time, sportive and therapeutic
		Low quality of Public transport inside the urban and suburban	Increasing quality of Public transport inside the urban and suburban
		Unequal distribution and inappropriate accessibility to welfare in the case study	equal distribution and appropriate accessibility to welfare in the case study Equal accessibility to welfare compared with the other regions of Tehran and zones of region 15

5. Conclusion

In summarized, environmental injustice raised in the result of incorrect decision making and taking in the case study. All stakeholders from government to resident pay no attention and inequality at all areas emerged. Finally, the elected scenario in order to decline and decrease these inequalities is: Increased attention to this settlement deal with the authorities, increase in environmental health, create new job opportunities and development of utilities in the case study.

he finding of this study is presenting the process of achievement and analysis of the environmental justice which can be applied in other planning cases. Introducing the measurements indicating environmental injustice result in distinguishing the analysis of spatial inequalities and other issues which are regarded as the problems equal to environmental justice. These measurements specify the causes of injustice and propose the suitable solutions for them.

In order to expand the findings of this research is suggested to:

First- applying environmental justice analysis up to strategy production level in the urban plans

Second – determining accurately the position of environmental justice in the planning process.

Third – synthesising recent justice and collaborative theory with environmental justice in order to improving its implementation.

Fourth – thinking globally and practicing locally in order to use recent environmental justice experiments.

Table 8 Scoring alternative scenarios produced based on achievement rate to goals

scenario	area				Total
	Procedural equity	Environmental equity	Economical equity	Social equity	
First	2	2	2	2	8
Second	2	2	2	1	7
Third	2	2	1	2	7
Forth	2	2	1	1	6
Five	2	1	2	2	7
Six	2	1	2	1	6
Seven	2	1	1	2	6
Eight	2	1	1	1	5

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