

## Participatory Brownfields Rehabilitation Aiming at Social Revival

Nilofar AsadiAsl<sup>1</sup>, Mohammad AsadiAsl<sup>2</sup>, Parisa Kohandelnia<sup>3</sup>, and Saied ToyorParvaz<sup>3\*</sup>

<sup>1</sup>Master of Science in Environmental Design Engineering, Azad University of Science Research, Iran

<sup>2</sup>Undergraduate Master of Urban Planning Qazvin Azad University, Iran

<sup>3</sup>Master's Degree in Environmental Design Engineering University of Tehran, Iran

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#### \*For Correspondence

Master's Degree in Environmental Design Engineering University of Tehran.

**E-mail:** saeidp27@gmail.com

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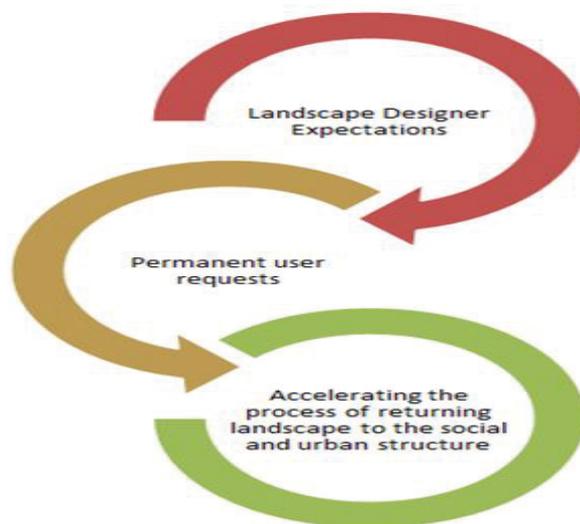
#### ABSTRACT

Brownfield refers to the sites with pollution or suspected to be polluted which are valuable for surrounding environment from a social perspective in addition to their apparent functional role as an industrial site. In urban brownfields (sites which are changed to an urban landscape by urban development, gradually) elimination of the previous land uses over time entails new problems such as pollution and increment of the social hazards such as abandoned sites in addition to the primary effects, i.e. the relevant economic opportunities. Reviving such sites using the landscape and environment designing is an effective step taken in line with the reduction of these adverse effects, while it is an effective and useful revival of the site to the city. Designing the landscape and environment is the reviving factor for post-industry sites and helps the urban sustainable development acceleration in relation with the urban abandoned industrial landscapes. In social term, this means the revival of a site which is directly related to history and identification of the city in addition to strengthening the urban physical sustainability factors and helps surrounding society's identity improvement and the city's socio-cultural sustainability. In this paper, at first the discussions like urban redevelopment and post-industrial landscapes revival would be investigated based on the users and designers' perspective and then, using the developmental methodology, an abandoned mine landscape design would be studied to find the answer of this question: how does revival and redefinition of an old iron mine site, for preserving and enhancing the cultural identity, help the urban and social redevelopment? The results were obtained considering the purification and elimination of pollutions with different procedures like phytoremediation, burring and limitation of access or soil transportation as well as polluted elements, using the present elements in new applications creating cultural-historical experience with the landscape, creating interactive spaces for public relations surrounding the site and developing the present systems and considering the user attraction factors surrounding the site and its link to the site potentials.

### INTRODUCTION

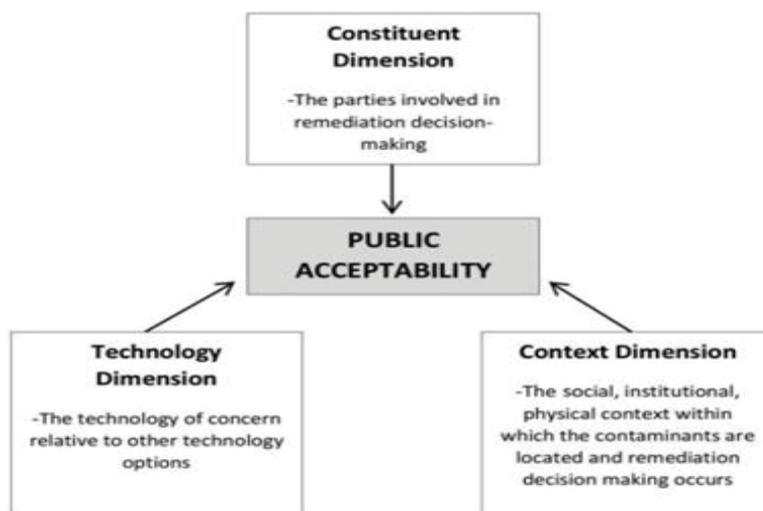
Over time, the urban structure quality has been changed based on the individuals' lifestyle change. During recent decades, there have been problems resulted from irregular and dispersed urbanization based on the land restrictions and the sustainable development and redevelopment of the brownfield was taken into consideration. Brownfields redevelopment is important because abandoning these lands leads to significant damages to the local communities. In another word, based on the fact that these lands are polluted and entail environmental hazards due to these pollutions, they are effective in local communities to large extent [1-3]. The urban industrial landscape, irrespective of its presence and formation of cities around it or it was located as sub-urban areas and urbanization put it in urban areas, has become a part of the citizens' life and led to some living issues and lack of the social identity due to the direct and indirect influences on citizens in addition to economic aspects like direct investment via direct employment or indirectly via the relevant employment opportunities to the industrial site or its parties functions, i.e. owners, employees and consumers or serving them [4]. On one hand, the revival of these lands leads to real-estate price enhancement and pollution effects, environmental threats and issues reduction, increase in districts' quality and attraction and following it, socioeconomic indicators enhancement along with the environmental [5,6]. In a social and functional revival of such sites, there

are many factors involved the important aspect of which is post-industrial landscape designer's expectation and more important, its permanent users' demands or the surrounding residents (**Figure 1**). Taking all these factors into consideration in site designing will help the acceleration of reviving these landscapes to the social and functional urban structures <sup>[7]</sup>. Since the urban post-industrial landscapes redevelopment has become the main part of the urban development, the urban development concept for these landscapes evolved over time. In 1980, the first rules of redevelopment for these lands were investigated and approved.



**Figure 1.** Social and functional revival <sup>[7]</sup>.

This rule is to confront with pollutions creation and eliminating them as a desirable response to the negligence on these lands, attracting the role of factories and other firms in the formation of these lands and making them responsible for this phenomenon. In following years also other rules were approved all of which were in line with redevelopment and decontaminating these lands <sup>[8]</sup>. Regarding the redevelopment of the post-industrial site, there have been numerous researches and projects conducted in USA and UK. For example, a study in 2015 entitled "Post-industrial landscapes as drivers for urban redevelopment: Public versus expert perspectives towards the benefits and barriers of the reuse of post-industrial sites in urban areas" explained the challenges and crises due to benefits of reviving these polluted sites <sup>[7]</sup>. In addition, in another research entitles " Phytoremediation for lightly toxic sites: Hazard perception and acceptance of remediation alternatives" in 2016, the public perception of these polluted sites as well as local community perspectives on reviving these sits and the necessity of this action was analyzed <sup>[9]</sup> (**Figure 2**).



**Figure 2.** PACT conceptual framework <sup>[9]</sup>.

In another study entitled "Phytoremediation as green infrastructure and a landscape of experiences", the desirability of landscapes formed for the lands after remediation was investigated <sup>[10]</sup>. The other research entitled "The role of liability, regulation and economic incentives in brownfield remediation and redevelopment: evidence from surveys of developers" (2005) studied each of the infrastructural features before the practical remediation process started in brownfields <sup>[11]</sup>. Generally, the expectations of designing post-industrial abandoned landscape are investigated from 2 perspectives: on one hand, the site practitioners, i.e. designers as the most effective individuals in the visual and functional formation of landscape and, on the other hand, major site

users of the landscape designed [7,12,13]. In prioritization dimension from practitioners' perspective, however, there are many factors considered; the design aesthetics is the highest priority while from a public perspective, the function considered for the newly designed site is of most importance [14]. In designing limiting element dimension, the cost and budget are the most important experts' concerns while the public is concerned with pollutions, how to eliminate the pollution and hazards in using the site due to lack of expert perspective and knowledge [15]. In term of the design advantages and reuse of an industrial abandoned landscape in cities, the development and distribution experts take the urban entertaining centres as the most important features into consideration while public takes the employment opportunities and promotion of them, directly and indirectly, site-related businesses as priorities [16].

### THE EFFECTIVE FACTORS ON DESIGN

Generally, the effective factors on designing are classified into 2 classes: i) industrial landscape identification indicators including the social dimension, historical background and visual form which includes all cultural factors related to the site, and ii) the positional-physical indices which focus on the present site characteristics [4]. In the evaluation of an industrial landscape background, it is important to note 3 factors. At first, it is required to investigate the effects and social aspect of an industrial site based on its presence in urban social structure. By investigating the social and historical aspects like how the industrial site is formed, its history relevant to the city and their effects on each other would be important. Third and most significant landscape identity factors is the physical view and its visual dimension [17]. In term of the physical indices, all effective factors on a public landscape in designing such as climate, light and sun ray, vegetation, soil texture, type and volume and time of the precipitations, humidity, temperature and so forth are analyzed. In addition, issues like type and level of the pollution in site and its origin as well as how to cope with the pollution would also be considered in a post-industrial site [10] (Figure 3).

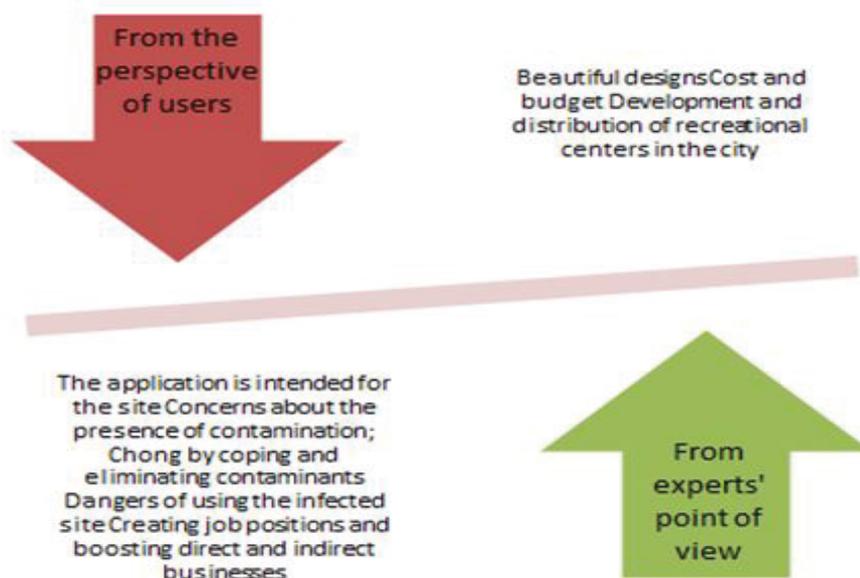


Figure 3. Effective factors in a public landscape [10].

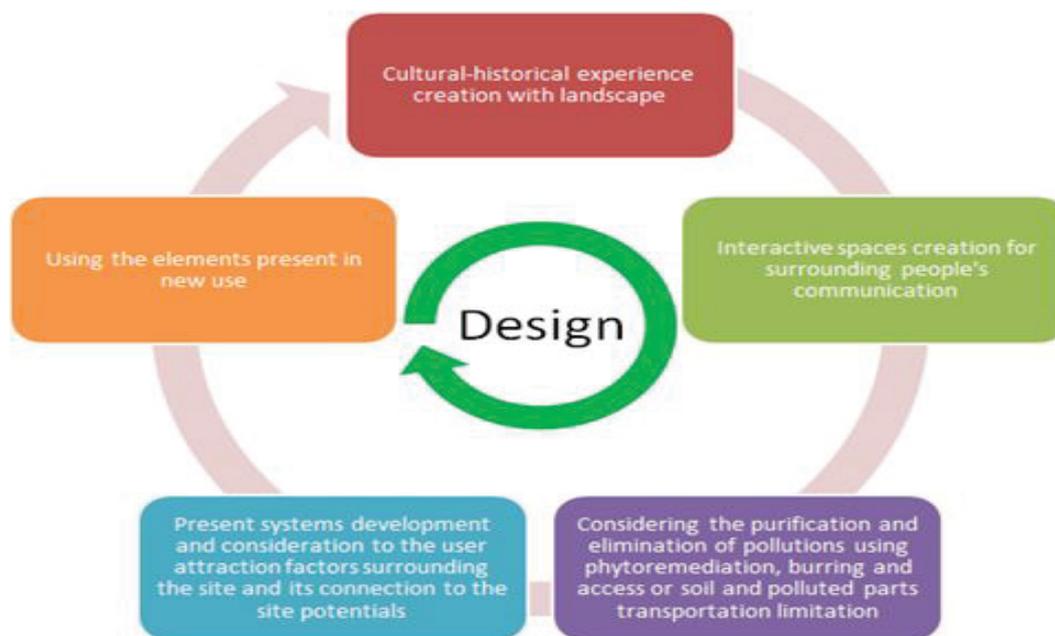
### THE PLANNING REQUIREMENTS

According to the studies conducted on the subject, in designing a landscape (Figure 4), particularly when the post-industrial landscape redesigning aims to connect it to the social and public urban structures (Table 1), there are numerous points to note such as followings:

- Creating a cultural-historical experience with the landscape
- Using the elements in a new use
- Interactive spaces creation for surrounding people's communication
- Present systems development and consideration to the user attraction factors surrounding the site and its connection to the site potentials
- Considering the purification and elimination of pollutions using phytoremediation, burring and access or soil and polluted parts transportation limitation

**Table 1.** The planning requirements.

S. No	Studied variables
1	Cultural-historical experience creation with landscape
2	Using the elements in new use
3	Interactive spaces creation for surrounding people's communication
4	Present systems development and consideration to the user attraction factors surrounding the site and its connection to the site potentials
5	Considering the purification and elimination of pollutions using phytoremediation, burring and access or soil and polluted parts transportation limitation



**Figure 4.** Factors effect on design.

## DISCUSSION

The results of this study indicate the needs for designing a post-industrial perspective as the main concern in public development versus interest-based views and barriers to reuse post-industrial sites in urban areas as well as the problems and challenges due to the persistence of people's interest in restoring polluted sites. The results of the survey on the perception and acceptance of replacing over-industrial sites by the public suggest that people's perception of infected sites as well as the local community's views of the revival of such sites and the need to revive these sites are different. In general, the desirability of landscapes created after regeneration and after resuscitation varied among design experts, local communities and permanent users of the site. It was observed that from the perspective of the designers, the beauty of the site is the most important factor in order to be accepted by the public and the cost to revive such sites from the perspective of designers is the main challenge. Distribution of recreational sites in the region is also a factor that designers should consider before designing such sites. From the site's permanent user's viewpoint, the concern that the revived sites have done well in reducing pollution and that the use of these sites will not be problematic is their most important challenge and the amount of income the sites provide for public people them is one of the most important goals that people are looking for. In this study, the role of accountability, economic regulation, and incentives for reforming the brownfields and their redevelopment has been examined and the results indicate the impact of these factors on the design and revitalization of post-industrial scenery.

## CONCLUSION

Along with the industrial revolution and scientific advances, the industrial landscapes became a part of urban physical structures and over time, on one hand, with unstoppable advances of the science and, on the other hand, by reduction of industrial landscapes efficiency, they were to some extent abandoned and unused sites in the urban landscape. The environment and landscape designing is the remediating factor for post-industrial sites and helps accelerate the urban sustainable development relative to the abandoned industrial landscapes. In social term, this means the revival of a site which is directly related to history and identification of the city in addition to strengthening the urban physical sustainability factors and helps surrounding society's identity improvement and the city's socio-cultural sustainability.

## RECOMMENDATION

- Attention to the elimination of physical pollution caused by the presence and activity of industry in the previous structure
- Paying attention to the social impact of designing the correct user-related user
- Create new applications for sustainable urban development
- The need for users to constantly retrieve advanced games
- Reviewing the budget and allocating financial resources to such projects
- Pay attention to the visual beauty of the designs presented
- Considering credible credentials for end users of such schemes, which are often local

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