

ORIGINAL ARTICLE

## A Social Responsibility of Landscape Architecture as a Green Infrastructure for Environmental Justice Realization

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### Abstract

The main task of landscape architecture is to create a higher quality of the environment by utilizing resources or to provide effective stewardship for the preserved environment. These outcomes enhance the correlation between humans and the environment. Landscape architect deals with direct use of market economic goods in private property resources such as capital, land, plant, structure. But it also has indirect use of non-market economic goods in public resources like scenic view from the forest, sea, urbanscape, and refreshing atmosphere. At this point, landscaping products should have a role of public goods, and even these attribute to individuals or certain group. From the results of neo-liberalism regime in modern era such as guarantee of private property, deregulation for free market, and reduction of social welfare, minority has getting less opportunity to enjoy the quality life in ecotop and social welfare. With all future, landscape architecture should have the role of social infrastructure through planning concept that ensures public interests first. The virtuous functions of Green Infrastructure is a proper tool in realizing environmental justice in that it efficiently protects environment, and distributes fair benefits to all people.

**Key words** : Social infrastructure, Green infrastructure, Social justice, Environmental justice

### 1. Introduction

Landscape architecture(hereinafter, referred to as “Landscaping”) is the work connecting an environment with a human using given resources. Landscaping is an act of creating a new environment using personal property like land, plants and structures, etc., or efficiently preserving the existing environment. However, the resources used for an act of landscaping include not only personal property but they also include public resources, such as the sea, public waters, refreshing atmosphere, and forest to be

viewed by people, and cityscape, etc. In this respect, products of landscaping could become private possessions which belong to an individual, but they have to carry out the role of public goods. Industrial development in modern times has brought about an environmental crisis by causing excessive use of resources. An environmental crisis degrades the quality of life from a human’s physical aspect, and the social quality of life as well. Particularly, there exists an aspect of degradation of environmental quality in the neoliberalism system represented by guarantee of personal property rights, respect for market principles,

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and reduction in public welfare, etc. In this respect, landscaping should be planned as social infrastructure which makes it possible to use resources for public interest, and to give all people benefits. The approach to landscaping as social infrastructure could be the best way for putting environment justice into practice by giving consideration for the socially underprivileged. This study has significance in inquiring into the possibility of landscaping in its philosophical approach which contributes to society other than a functional approach which solves environmental problems through landscaping. The purpose of this study is to consider the significance of Green Infrastructure which is the role of landscaping as social infrastructure with focus on its socio-economic significance rather than its physical, environment aspects, and also to consider the philosophy of landscaping planning which could make a successful contribution to realization of environmental justice in neoliberalism market economy.

## 2. Social Justice and Environmental Justice

The preferentially associated terminology before considering environmental justice is social justice. In general, social justice can be defined as "The belief that every individual and group is entitled to fair and equal rights and participation in social, educational, and economic opportunities"(ASLA, 2014). Social justice objects to investing an individual with a sacrifice, nor does it invest a differential regardless of whether the sacrifice intensity is weak or strong. Besides, social justice insists on a sense of responsibility for rights as well.

Smith(2007) insisted that social justice is divided into formal justice which is fairly applied to all people formally, and substantial justice which gives a share to an individual by issuing a reasonable disposal corresponding to the considered difference between people. However, formal justice is accompanied by

hardships in accomplishing a just society only by treating all people unconditionally and equally without taking into account the difference between individuals. On the contrary, substantial justice is deeply connected with a human's concrete way of life, so it's dangerous to universally apply this justice. Also, there is a limit to making a reasonable decision in the light of the difference between people. It's because there cannot but exist a limit for all people to make a fair contract on an equal stance realistically. As regards such a problem, Rawls(2005) emphasized that fairness must be secured on the basis of a universal, fair opportunity and condition. Rawls(2005) defined social justice as procedural justice with the description that the first principle of justice is to get all people to enjoy freedom impeccably; the second principle of justice is to give preferential consideration for the poorest people's welfare, and the third principle of justice is to give an equal opportunity to all people although there exists inequality of results. Such social justice has been a major concept, which forms ethics of human society, from Plato, Aristotle up to today's Sandle. Then, is it possible for such social justice to be applied to the environmental problem, with which we are placed today? Generally, environmental justice could be defined as two sorts of meanings. "First, it is a social movement whose focus is on the fair distribution of environmental benefits and burdens. Second, it is an interdisciplinary body of social science literature that includes theories of the environment, theories of justice, environmental law and governance, environmental policy and planning, development, sustainability, and political ecology." (Schlosberg, 2007). The environmental justice as a social movement puts emphasis on environmental benefits which return to an individual, and fairness of responsibility consequent on utilization of environment. The environmental justice from the socio-scientific aspect refers to those cultural norms and values, rules, regulations, behaviors, policies, and

decisions to support sustainable communities where people can interact with confidence that the environment is safe, nurturing, and productive (Bryant, 2004). Then, which concept among formal justice, substantial justice and procedural justice could be most desirably applied to such environmental justice? Kim(2006) explained the relationship between damage caused by the hurricane which happened in New Orleans in the US in the summer, 2005 and environmental justice. Hurricane is a tropical cyclone which is a natural phenomenon happening every year, but it might be safe to say that hurricane is amplified as a weather anomaly consequent on climate warming caused by a human's environmental damage. It could be also called a man-made calamity happening due to the lack of infrastructure which can minimize the impact of insufficient drainage facilities and environment of a community. Most of the victims from such disasters were the socially underprivileged who lived in an area where social infrastructure was insufficient. As another example, as a result of surveying the impact of heat waves caused by anomaly climate in Korea in the summer, 2010, on health by social class, the survey reported that the residents in a densely populated area with the socially underprivileged got a lethal impact on their health due to the rise of temperature and blood pressure caused by the rise in indoor and outdoor temperatures (Shin et al., 2013; Eum and Yun, 2015).

In addition, The damage caused by the global natural disasters is found to be much heavier in developing countries than OECD countries, and locally, the natural disaster-caused damage is found to be much bigger in the residential area for the socially underprivileged than that in the residential area for the economically, socially upper class (United Nations, 2006). Obviously, OECD countries are consuming a lot more natural resources, and inviting a lot more environmental damage than developing countries; moreover, the socio-economic upper class are

enjoying a lot more resources than the socially underprivileged. It might be obviously unreasonable to say that more responsibility for damaging environment on the globe rests with the socially underprivileged. However, the fact that the socially disadvantaged suffered from a lot more damage from environmental disasters in the aftermath of hurricane in New Orleans; that the socially disadvantaged are more exposed to anomaly climate, and that developing countries get more environment disasters all belong to environmental injustice. Justice is basically distributive justice in that which distributes limited assets and resources that cannot possibly meet all standards of people. However, in an environmental problem, burden justice should be preceded before distributive justice. The assets and resources obtained from a human's labor and efforts should be reasonably distributed as a benefit, but in case of consumption of natural resources, and natural environment damage, there should be the distribution of responsibility according to the benefit principle.

Although conceptions of natural resources are informed by both personal experience and scientific understanding, they are social structure (Clayton and Myers, 2015). Merchant(1980) insisted "Values of natural environment are created within a cultural and social contents" In this respect, environment justice cannot be solved by formal justice, or substantial justice. Rawls-argued procedural justice by social contract could be advantageous to realizing environmental justice. Social contract means a fair contract so as not to be unfavorable individually or collectively. Such a contract has been already much applied to the situation where an environmental problem arises. As an example, there is an environmental improvement charges system, which gets a person, who discharges pollutants, to pay the corresponding pollutants treatment expenses according to the 'Polluter Pays' principle. Realization of environment justice depends more on how much

more fairly the responsibility for environmental damage and resources use is distributed than on how much more benefits are fairly distributed in environment.

In this context, the issue about whether a social contract can be made reasonably is closely linked with the politico-economic system. Consumption by purchasing resources means the market economy system, and its corresponding imposition of charges (taxes) means the government power intervention. Let's consider how environmental justice is realized in the system of neoliberalism, which criticizes the government power's market intervention, and sets importance on market function and private free activities.

### 3. Landscape Architecture as Social Infrastructure

Generally, the beginning of landscaping started from a human's leisure needs. Housing is a structure essential to human habitation, but a garden, which is the fruit of landscaping, is the product of a human's aesthetic needs (Park, 2007). Regardless of the East and West, the landscaping in ancient times used to be a private possession of some privileged class other than a facility for general public. Landscaping, which symbolized power of a king and the nobility and represented state authority, has continued to exist up to modern times. Such phenomena can be confirmed by physical vestiges and social heritages which have remained up to now. The mass politics, which have developed along with industrial society, have made it possible for the people to get benefits of landscaping. The representative case is a public park. It means the beginning of landscaping assuming a character as public goods, through which the general public enjoy a leisure, or can appreciate nature. City population concentration and natural environment damage in today's industrial society have lowered the quality of urban environment. In this respect, landscaping,

which adding ecological function, has developed in a bid to prevent excessive natural environment damage in modern society. Like this, landscaping has changed while applying several concepts demanded by society in the times. In short, it might be safe to say that the concept and function of landscaping have been determined by social needs. Today, Green Infrastructure, which has been introduced by many countries, well reflects the needs of modern society which puts emphasis on preservation of global environment and cost utility. A dictionary definition of Infrastructure is "the basic equipment and structures (such as roads and bridges) that are needed for a country, region, or organization to function properly" (Webster). Generally, infrastructure is divided into 'hard' and 'soft'. "Hard" infrastructure is defined as the large physical networks necessary for the functioning of a nation, whereas "soft" infrastructure refers to all the institutions which are required to maintain the economy, health, and cultural and social standards of a country, such as the financial system, the education system, the health care system, the system of government, and law enforcement, as well as emergency services (Fulmer, 2009).

Green infrastructure means the formation of network by linking a garden, park, green, river, farmland, and green belt. The origin of Green infrastructure began with the development of urban agriculture, and garden allotment in the 1870s. People formed the network to secure farmland in an urban area, and to make a smooth supply of water for farmland management. Afterwards, in the 1980s, Best Management Practice proposed to achieve more holistic storm water quantity management goals for runoff volume reduction/erosion prevention, and aquifer recharge. Green Infrastructure is a concept that highlights the importance of the natural environment in decisions about land-use planning (The Conservation Fund, 2009). Like this, Green infrastructure aims at obtaining economic gains through the increase in

natural environmental quality in an urban area, and efficient management. In addition, Green infrastructure provides a useful function and benefits not only to human society but also to natural environment itself. Erickson (2006) explained that the major function of Green infrastructure is to continuously maintain the change process of eco-system, conserve diverse species, improve water quality and prevent natural disasters. Development of Green infrastructure appears as a physical result, i.e. a group of land and resources. In this context, Green infrastructure can be classified as a category of hard infrastructure. Urban forest, which is the representative type of Green infrastructure, produces diverse effects, typically, reduction in energy use, improvement of urban heat island, prevention of air pollution, and the increase in land value, etc. Actually, in case of Sacramento region in the US, they reduced as much as 47% energy consumption on the strength of urban forest. This is the result from reducing air-conditioning cost through temperature adjustment of the urban forest. Another important type of Green infrastructure is water management system. A population of 1.2 billion accounting for one fifth of the whole world population are suffering from water shortages. Climate change and pollution of water supply sources have brought about acceleration of urban population concentration, and consequently, in 2050, it is predicted that cities in the world will consume water twice the current water supply consumption. Hereupon, water management system of Green infrastructure, such as water quality management through precipitation storage and plants, etc., has become an important plan which makes it possible to solve the future humans' water shortages phenomenon. In small scale, benefits of trees as a green infrastructure provide increasing property values, removing CO<sub>2</sub> from the air, and reducing energy consumption by cooling shade. Randle(2007) reported that New York City's street trees provide about \$122

million in benefits annually. Besides such a physical effect of Green infrastructure, there exists socio-economic usefulness as well. Wolf(2008) explains that Green infrastructure provides relaxation, a walk, jogging, etc. to citizens, and also gives help to local economy revitalization as tourism resources. In this respect, Green infrastructure has a function of 'Soft Infrastructure' like educational system, and medical service system, etc. in society.

#### 4. Realization of Environmental Justice through Green Infrastructure

Then, what relationship might exist between the strong points of Green Infrastructure and today's environment justice? As mentioned previously, the origin of landscaping began with extremely a private area other than a public area. The object for landscaping which is the fruit of an individual's satisfaction of aesthetic interest and leisure needs was void of public interest value. Landscaping is an act of handling its objects, i.e. land and natural environment, and although land and natural environment in use belong to an individual, the act of landscaping should have extremely a public purpose in that land and natural environment have an influence on the surrounding environment. Today, neoliberalism accepted by modern capitalist states is the system, which serves development of a state and society based on the market principle, together with the reduction in a state role. A policy, which guarantees an individual's property rights to the maximum, and reduces social welfare, aggravates polarization socio-economically. Such polarization contributes to reduction in benefits which the socially underprivileged can get from environment. For example, the UN declared the Human Right to Clean Water and Sanitation Water in 2010. It means that water resources cannot be an individual's private possession, but they should be managed for the sake of public interest, and should be

used by all people. Green Infrastructure is an important tool which can improve the urban water quality environment, and secure water resources. When the socially underprivileged fail to use water resources due to the lack of economic ability, the reduced welfare advocated by neoliberalism cannot solve this problem. For solving these problems, many researches support that people who live in neoliberalism system will focus on satisfying immediate needs, such as security and economic well-being from environment (Inglehart, 1995; Hodgkinson and Innes, 2000; Stag and Siever, 2000; Kilbourne, 2001).

As another example, this study previously explained that the socially underprivileged suffered a lot more damage caused by summertime heat wave in Korea. The socially underprivileged, who cannot effectively replace the elevated temperature due to the urban heat island phenomenon consequent on urbanization, suffer more damage caused by environment than other social classes. Likewise, even in case of Hurricane damage in New Orleans in the US, the damage suffered by the socially underprivileged was found to be bigger than other social classes. The social class, who consumes good quality environment, and discharges more pollution sources, is not the socially underprivileged. In other words, distribution of the benefit from environment in modern society is unfair by environmental justice. In a liberal regime where our society is placed other than socialist system, it's difficult to find a proper solution to modification of such unfair environment justice realistically. However, it seems possible to realize environmental justice in justice of responsibility other than distributive justice in environmental problems. Its distribution method is that the more cases of the class who consumes lots of environmental resources, the more heavily their responsibility for paying taxes, or cost is distributed. The financial resources mobilized in such a way must be spend in developing Green

Infrastructure of social infrastructure which can reduce environmental damage. Environmental justice could be realized in that urban temperature adjustment, prevention of natural disasters, and water quality management, etc. through Green Infrastructure distribute environmental benefits to the socially underprivileged fairly. Also, the social function other than physical function of Green Infrastructure can play a role as soft infrastructure by providing the socially underprivileged with the opportunity for health, leisure, and recreation.

## 5. Conclusion

Landscaping in a classical sense is a far cry from realization of environmental justice. It's because handling natural environment and developing artificial environment were not the public interest purpose. The ideology of democratic equality in modern society has transformed the purpose and function of landscaping. The landscaping, which switched from an individual's private possession to public goods, should speak for exhaustive public interest. Maximization of such public interests can conserve environment, and fairly distribute the benefit obtained from environment to all people. The virtuous functions of Green Infrastructure is a proper tool in realizing environmental justice in that it efficiently protects environment, and distributes fair benefits to all people. In a sense of environmental philosophy, Green Infrastructure is the fruit of Deep Ecology. The natural-environment-centered Deep Ecology other than human-centered respects the relationship between individual subjects of natural environment. Gray Infrastructure like road, port and railroad, etc. takes into account environmental convenience of human life only; on the contrary, Green Infrastructure can be called Deep Ecology in that it is the system which enhances mutual relations between vegetation, soil, water resources, air and people, etc. Green

Infrastructure based on the principle of Deep Ecology like this can be called the link between a human using environment and environment providing resources in that it respects structural particles of natural environment including every single human, and develops the system where they can coexist. The empirical researches explore relationship between deep ecology and philosophical concept of green infrastructure, it should be established for the future research. These empirical researches would accumulate the ground theory of landscape architecture's role in environmental justice.

#### REFERENCES

- ASLA, 2014, [https://asla.org/uploadedFiles/CMS/Meetings\\_and\\_Events/2014\\_Annual\\_Meeting\\_Handouts/SAT-A10\\_Social%20Justice%20The%20New%20Green%20Infrastructure.pdf](https://asla.org/uploadedFiles/CMS/Meetings_and_Events/2014_Annual_Meeting_Handouts/SAT-A10_Social%20Justice%20The%20New%20Green%20Infrastructure.pdf)
- Bryant, B., 2001, Issues, policies, and solutions, Environmental justice, University of Michigan, MI., USA.
- Clayton, S., Mayers, G., 2015, Conservation psychology, Wiley Backwell, NY., USA.
- Erickson, D., 2006, Connecting open spaces in North America cities, Washington Metrogreen, Seattle, WA., USA.
- Eum, J. Y., Yun, S. J., 2015, A Study on the heatwave management plan for low-income aged people, Space and Society, 25(4), 317-342.
- Fulmer, J., 2009, What in the world is infrastructure?, PEI Infrastructure Investor, July/August, 30-32.
- Hodgkinson, S., Inners, M., 2000, The prediction of ecological and environmental belief systems, Journal of Environmental Psychology, 20(3), 285-294.
- Inglehart, R., 1995, Public support for environmental protection, Political Science, 58, 1013-1020.
- Kilbourne, E., 2007, A Multinational examination of the role of the dominant social paradigm in environment attitudes of university students, Environmental Behavior, 33(2), 209-228.
- Kim, H. S., 2010, Failure or limitation of planning, focused on the catastrophe of New Orleans cause by Hurricane Katrina, The Journal of Korean Regional Development, 38(2), 61-84.
- Merchant, C., 1992, The search for a liveable world, Radical Ecology, NY. USA.
- Park, C. I., 2006, Responsibility of landscape architecture in East Asia, Perspective of the western environmentalism and East Asia, Journal of Landscape Architecture in Asia, 2, 243-249.
- Randall, D., 2007, Perhaps only god can make a tree, but only people could put a dollar value on it, New York Times, April, 18, USA.
- Rawls, J., The role of justice, a theory of justice (2005 reissue), NY., USA, 3-4.
- Schlosberg, D., 2007, Theories, movements, and nature, defining environmental justice, Oxford University Press, London, UK.
- Shin, J. Y., Lim, Y. S., Hong, N. H., Kim, N. Y., 2013, Study on investigation and analysis of climate change adaption support measure for vulnerable population, KEI Working Paper, 2013-16.
- Smith, D., 2007, Spirituality, social justice, and language learning, IAP., USA.
- Steg, L., Sievers, I., 2000, Cultural theory and individual perceptions of environmental risks, Environmental Behavior, 32(2), 250-269.
- The Conservation Fund, 2009, Green infrastructure, Accessed 2009-10-06 Arlington, VA. USA.
- United Nations, 2006, Social justice in an open world: The role of the United Nations, The international forum for social development, Department of economic and social affairs, Division for Social Policy and Development, ST/ESA/305" (PDF). New York: United Nations.
- Wolf, K., 2008, Its function, benefit, and values, Metro Nature, University of Pennsylvania press, PA., USA.