

DISPUTE ON GREEN INFRASTRUCTURE MEGA PROJECT: MANAGING THE RISK ON PRESERVING THE EARTH

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Abstract

The world is overcrowded. the total number of living humans on Earth was 7.349 billion as of 1 July 2015. The United Nations further estimates in its publication “The World at Six Billion” that the number of population will hit the 9 billion in 2054. Eco-friendly infrastructure planning which provides more green spaces and support environmental resources has been developing to answer the need. Millions of dollars are invested to finance the so- called Green Infrastructure Mega Project. A high investment in the Mega Project of Green Infrastructure will surely increase potential legal dispute, such as: responsibility to obtain Green Infrastructure certification, failure to performs the benefits promised, and non- certification of operational & maintenance personnel. Therefore, ways to mitigate the risk is suggested namely: clearly defined risk allocation, no promises or warranties inside the contract that cannot be fulfilled, and ensuring certification of all personnel.

Keywords : *Green infrastructure, infrastructure, environment, earth.*

A. INTRODUCTION

According to data from the Population Division of United Nations Department of Economic and Social Affairs as compiled by Worldometers (2015), the total number of living humans on Earth was 7.349 billion as of 1 July 2015. The United Nations further estimates in its publication “The World at Six Billion” that the number of population will hit the 9 billion in 2054.

The above figures indicate that our planet has to cater the needs of such numbers of population. Global footprint network calculates that if 7 or more billion of people were to enjoy a European standard of living - which is half the consumption of the average American- our planet will only able to support around 2 billion people according to World Population Balance. The question is how much longer will the earth be sustainable to support our future generations?

Eco-friendly infrastructure planning which provides more green spaces and support environmental resources has been developing to answer the need. Eco-friendly planning is required to protect the environment and to increase the earth’s sustainability while constructing an infrastructure that is improving human’s standard of living. Millions of dollars are invested to finance the so-called Green Infrastructure Mega Project.

The World Economic Forum estimates that USD 5.7 billion worth of Green Infrastructure may be needed by 2020 in order to realise environmental policy objectives in sectors such as agriculture, transport, power, and water.

Financial provider like Citigroup Inc. plans to lend, invest, and facilitate deals of green construction worth USD 100 billion by 2025 (Goosens, Bloomberg, 2015).

The increase of global investment in Green Infrastructure Mega Project construction means that there is a risk surrounding the billions of dollar of investment. The risk includes the failure by the contractor to conform to a certain standard agreed with the project companies and the unsustainability of the operational benefit of the project. In the future, disputes in Green Infrastructure Mega Project may include the return of investment, financing including guarantee-related issues, delay of projects and cost overruns, and building performance warranty.

This paper will limit its analysis to potential disputes in the construction contract of Green Infrastructure Mega Project in the next 100 years and discuss ways to mitigate the risk.

B. DISCUSSION

1. Green Infrastructure Mega Project: A Strategic Promise To Improve Quality of Human Living and To Sustain The Ecosystem

Worldwide Commitment To Implement Green Infrastructure

For thousands of years, human being reaped the benefits from nature such as food, clean air, and clean water. We take it for granted that the nature-given gift has unlimited resources. However, the future will remain in questions. European landscape has suffered more compared to other continent in habitat loss and fragmentation that endangered biodiversity (European Commission, 2010).

A case studies done by the United States Environmental regarding municipal policies for managing stormwater with green infrastructures revealed that any large cities in the

United States have combined sewage and storm water pipes which sometimes overflow. The rate of urbanization which is at around 75% in Europe alone, is expected to grow by 80% in other countries according to Proceedings of the Resilient Cities Congress held by Local Governments for Sustainability (ICLEI) in 2012. The increase in human population has endangered the sustainability of our living ecosystem, put biodiversity at risk, and eventually lead to the unsustainability of our planet.

Considering the potential risks above, countries around the world have committed to implement a sustainable development in a hope to fulfil the needs of today's generations without sacrificing future generations (Asshidique 2009:2). The Stockholm Convention held by the United Nations Conference on Human Environment in 1972 addressed the right of every man to have a decent environment as their basic rights and the needs to safeguard the earth's natural resources for the benefit of present and future generations through careful

planning or management. The Stockholm Convention then followed by the Earth Summit in Rio de Janeiro, Brazil (United Nations Conference on Environment and Development) in 1992 which resulted in Agenda 21 the Rio Declaration on Environment and Development and the follow up mechanism in establishing commission on sustainable development.

Following those two Conferences, European Union has implemented environmental programs and strategies that incorporated Green Infrastructure as one of the mechanisms to enhance Natural Capital. The policy is implemented among others in: the 7th Environmental Action Program, Commission Communication entitled 'Green Infrastructure (GI) - Enhancing Europe's Natural Capital', Commission Communication entitled 'Europe 2020 - A strategy for smart, sustainable and inclusive growth', the Roadmap to a Resource-Efficient Europe, and the EU biodiversity strategy to 2020. Following the European Union target, in 2015 the United Kingdom published a report titled Demystifying Green Infrastructure and which contains a strategy for England Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Service which included Green Infrastructure to net gains for nature.

In the developing world, Green Infrastructure also has been encouraged. Indonesia, as one of countries with the largest rain forest, plays an important role in global sustainability by hosting the Indonesia Green Infrastructure Summit 2015. Indonesia has also enacted laws which incorporate the concern in Green Infrastructure, such as in Law Number 32 of 2009 concerning Environmental and Minister of Environmental Regulation Number 10 and 11 concerning Strategic Plan of Ministry Environmental 2010-2014.

This shows the government's support to Green Infrastructure strategy and it is expected that the number of future projects will be encouraging.

Green Infrastructure Defined

Green Infrastructure is yet to have a single accepted definition. There are multiple explanations, which refer to the terminology. Nonetheless, firstly, it needs to be differentiated with Green Planning. At a glance the difference may not be clear. The scope of green planning can be referred in Planning for Open Space, Sport and Recreation of the United Kingdom: PPG17. Green Space planning works more in the context of recreational, amenity and public open spaces. The Green Space Planning

looks more in any accessible open space at local authorities and focus on to the condition, quality, and access, to plan a strategy and action plan which sets out future management and regeneration policies (Natural England,2009).

On the other hand, the Natural England's Green Infrastructure Guidances defines Green Infrastructure as:

"Green Infrastructure refers to a strategically planned and managed network of green spaces and other environmental features vital to the sustainability of any urban area. Green Infrastructure is a strategically planned and delivered network comprising the broadest range of high quality green spaces and other environmental features. It should be designed and managed as a multifunctional resource capable of delivering those ecological services and quality of life benefits required by the communities it serves and needed to underpin sustainability. Its design and management should also respect and enhance the character and distinctiveness of an area with regard to habitats and landscape types."

The definition clearly corresponds with the Planning Policy Statement 12 (PPS12) of the United Kingdom: Local Spatial Planning and within the Eco Towns Worksheet, which states that:

"Green infrastructure is a network of multi-functional green space, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities".

According to the PPS12, Green Infrastructure can be different in scale. It can be formed as, individual street trees, green roofs, wetlands, forest, agricultural land, etc.

Meanwhile, in the United States, Green Infrastructure is defined as:

"Using and enhancing natural system to absorb and filter pollutions from the air and water, protect communities from flooding and storm surges, reduce erosion, and create healthier, more sustainable urban environments." (Conservation Advisory Council, 2015)

The United States defines Green Infrastructure as a natural system that manage urban storm water and controlling Combined Sewer Overflows (CSOs) which will result in a more sustainable environment, whereas, the United Kingdom sees a Green Infrastructure as a strategic network of high quality natural and semi natural areas with environmental features to deliver wide range of ecosystem service and to protect biodiversity.

The main requirements of Green Infrastructure features are that they need to be part of an integral part of an interconnected Green Infrastructure Network which can provide more than a green space. An urban park inside a city, for example, can only be qualified as an integral part of Green Infrastructure if it acts as a cool air corridor, absorbs excess water run-off and offers an attractive outdoor area for recreation and wildlife. In rural

areas, a highly-managed farmland would not automatically become part of a Green Infrastructure network, it needs to be specifically managed in a way that supports local biodiversity or encourages a more multifunctional land use which combines food production with other benefits, like recreation or water purification. (Conservation Advisory Council, 2015). A green building with

green-roof which is part of an integrated system can also be considered Green Infrastructure.

Based on the above, it can be concluded that Green Infrastructure is an integrated planning or network in a various features, built in a different spatial scale that can enhance the primary use of land, and unlock its benefit that will enable it to have multi- functional roles. The primary concern is to establish a sustainable living environment, to support surrounding ecosystem, and to benefit both environmentally and economically to all stakeholders.

Demystifying Mega Projects

Green Infrastructure can be implemented in a different spatial scale. It can be applied in a high density urban environment or in a rural hinterland. Ideally, the supportive network of Green Infrastructure that creates biodiversity is usually located in a wide- scale landscape area. Added with a high-technology required to achieve its objective to improve ecosystem; the green infrastructure usually cost from millions to billions of dollars.

The term "Mega Projects" according to Bent Flyvbjerg (2014) refers to:

"A large-scale, complex ventures that typically cost a billion dollars or more take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people.

Green Infrastructure Mega Projects are located in many countries in the world, such as: Ekostaden Augustenborg - an urban regeneration initiative in Sweden which cost Euro 22 million, Atlanta Belt line - a 22 miles of revitalization through Green Infrastructure which cost USD 4.3 billion, Los Angeles River Revitalization and redevelopment project that cost USD 1 billion. Looking at the potential investment in future projects, the Organization for Economic Cooperation and Development (OECD) estimates that the spending of global Green Infrastructure investment are approximately USD 36-42 trillion between 2012 and 2030, or will be USD 2 trillion per year or approximately two per cent of total gross domestic product annually (Kaminker, 2013).

Those huge investments in Green Infrastructure Mega Projects are intended to increase productivity and to generate various benefits for human wellbeing, the environment, and the economy. According the OECD the European Union invested EUR 270 billion per year for Green Infrastructure in a hope to result in EUR 170-320 billion savings per year and EUR 88 billion monetised health benefit per year by 2050 (Kaminker,2013).

The above figure illustrates the amount of investment in place for Green Infrastructure Mega Projects to deliver its promises. With hope and opportunity, comes risk and responsibility. New policies and regulations coupled with the yet-to-be-adaptable technology may create problems during the execution of Green

Infrastructure Mega Project construction. Thus, it is predicted that disputes related to Green Infrastructure

Mega Project will rise in the next 100 years. And, like any other construction contracts, arbitration will become the means to resolve such dispute. Therefore, it is necessary to address the potential legal risk and find ways to averse the risk following such investment.

2. Requirements of Green Infrastructure Mega Project

In a Gray-construction project, success will be largely determined by the contractor's compliance with the owner's requirements, particularly in terms of physical layout and construction of the project combined with its timely delivery. Once the project is completed, the operation of the project will be the owner's business. However, in a Green Infrastructure Mega Project, operational qualities are the ultimate success (Carson, 2015). The "promise" of a Green Infrastructure Mega Project is to deliver its performance benefits to the surrounding community and ecosystem, whether by reducing and delaying storm water runoff volumes, enhancing groundwater recharge, improving air quality (US EPA), mitigating urban heat, and increasing biodiversity (Dale, 2011).

In the spirit to ensure a Green Infrastructure Mega Project perform its operational characteristic and the benefits its promised, governments around the world has required the contractor to follow government's guidance. This can be seen in Green Infrastructure Guidance by Natural England, Green Infrastructure Guide by Conservation Advisory Council, City of Newburgh, New York, Green Infrastructure by the Department, of Transportation, District of Columbia, and Minister of Public Work and Community Housing of the Republic of Indonesia Regulation Number 05/PRT/M/2015 concerning General Guidance on Implementation of Sustainable Construction in Infrastructure and Housing.

Furthermore, certification for Green Infrastructure has been issued. In America, Sustainable Sites Initiatives (SITES), a certification for Green Infrastructure projects, was launched in 2015 (Green,2015). It is an interdisciplinary guidelines and performance benchmark for sustainable broader site and land design, construction, and maintenance practice (Sustainable Sites Initiatives). Another certification is called Envision which is a sustainable infrastructure rating system that provides a holistic framework for evaluating and rating the community, environmental, and economic benefits of infrastructure projects.

It looks primarily in resources and natural world protection rather than physical components of the landscape. It recognizes any infrastructure projects that assess sustainability more than the course of the life of the projects (Gutierrez,2015). Lastly, Salmon-Safe is a peer- reviewed certification program which link land management practices with the protection of agricultural and

urban watersheds. As part of a Green Infrastructure, a green building also has a certification called Leadership in Energy and Environmental Design (LEED). The LEED certification has been around longer than landscape Green Infrastructure certification. In 2012, there were 7.885 green buildings in the United States which have been LEED certified (Salkin, 2012).

Based on the above, it is understood that the Green Infrastructure Mega Project relies its success on the operational or post-project construction rather than during project construction.

3. Infighting Flares in The Green Infrastructure Mega Project

Demand for Mega Project construction in Green Infrastructure will be on the rise for many years to come. Governments commitment to encourage such projects can be seen in various policy and regulations as explained in Section B.(1) of this paper. However, those policy and regulations are newly in place, and the standards of practice to meet Green Infrastructure potential benefits may have not been fully addressed.

A transfer of risk in building a Green Infrastructure is way different with the Gray- Infrastructure. In Gray-Infrastructure projects, the types of claim more often than not narrow down to either a right to request for additional time for completing the works or to charge additional payment due to variations and prolongations (Hewitt, 2011). This means, when the contractor completed the project in compliance with the project company's requirements there is no further obligation to meet the agreed performance of the completed project.

It is expected that Green Infrastructure projects will experience similar types of legal disputes as the Gray-infrastructure projects such as potential overruns and additional fee for variations. However, its performance and "green" benefit of a completed project will also be part of the obligation in question along with other obligations that could potentially lead to legal issues. This following section will attempt to identify potential legal disputes in relation to Green Infrastructure Mega Projects:

Responsibility to Obtain Green Infrastructure Standards

The first potential legal dispute will be identifying party responsible to acquire Green Certification and bear the costs related in keeping up with its requirements. In *Shaw Development v. Southern Builders (2007)*, a LEED rating of a condominium project was never obtained and this resulted a loss of tax credit amounted to USD 635.000. Meanwhile, the contract also does not appear to govern the party responsible to obtain the LEED certification. It is anticipated that Green Infrastructure Project will face the same potential legal issues.

Failure to Perform Benefit As Promised

The second potential legal dispute will be related to how much benefit this Green Infrastructure could provide compared to its "sustainable" promises. This type of dispute was seen in the previous LEED dispute in Henry Gifford, et al. V United States Green Building Council, et al. (2010), where a professional in the environmental engineering and design industry, acted as plaintiffs, and alleged that United States Green Building Council (USGBC) has made false statements by issuing a New Building Institute study which stated that a LEED-certified buildings will be 25-30 per cents more energy efficient. In contrast, the plaintiff, who acted as the researcher in the study, concluded that a LEED-Certified building used 29 per cent more energy than the national average. In another case of Steven Gidumal, et. Al. V Site 16/17 Development LLV, et al. (2010), the owner of USD 4.2 million New York Condominium filed a law suit against the building's developer and manager for USD 1.5 million damages in relation to the alleged "green-construction" defects, such as insufficient heat from the "energy efficient" HVAC system.

From the above cases we may infer that a dispute in Green Infrastructure Mega Projects could arise with regard to the promise of delivering efficiency, increase sustainability and biodiversity or a certain performance expectations. Investors who have invested billion of dollars on the project would like to see these promises to materialize (Tamber, 2010). However, a measure to analyze the performance benefit has not been standardized yet. And this could potentially lead to legal dispute.

Non-License Operational & Maintenance Personnel

The third potential dispute in Green Infrastructure Mega Projects will relate to the personnel who operates and maintains the performance of the Green Infrastructure. The design and build contractor shall ensure that they have selected personnel who have long term responsibility for the projects due to the highly sensitive design and construction to sustainability, and energy efficiency (Tamber, 2010). However, the contractor may not always be available during the time of the project to ensure that the personnel follow the environmentally standard of operation and maintenance. Furthermore, there is still few certification in regards to Green Infrastructure personnels. Thus, dispute may arise due to qualifications of such personnels.

The above descriptions lay out the potential types of dispute surrounding the construction of Green Infrastructure Mega Project. Considering the billion of money invested in the Mega Project, risk mitigation is the best option to avoid disputes. The below section will attempt to identify ways to mitigate those risks.

4. Managing the Risk in Building Green Infrastructure Mega Project

In order to avoid future disputes, the following are suggested ways to mitigate risk in building Green Infrastructure Mega Project.

A Clearly Defined Risk Allocation

As explained above, performance of Green Infrastructure Mega Project is of the essence. Before such performance is measured, firstly, the project shall comply with laws, regulations, and available certification. An adequate contract will clearly define risk allocation for the project (Conley,2015). Therefore, in order to avoid potential dispute, a specifically-mentioned construction standard that specify performance and green certification expected shall be referred in the contract.

Moreover, parties who are responsible for specifying green criteria and assuring necessary coordination shall also be identified (Circo, 2015). A Green Infrastructure construction contract usually incorporated a clause requiring contractors to comply with all applicable laws and regulations, but, if things go sour the court will rely on the risk allocation governed under the contract. In *Bell/Heery V. U.S.* (2014), a USD 8 million dispute concerning obligation of the contractors to comply with all applicable states' law, the contractor claimed for additional expense to the Government for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. However, the contract specifically said that, the Contractor shall, without additional expense to the Government, be responsible for it? The case was won by the Government.

A specifically-mentioned standard and risk allocation in a Green Infrastructure Mega Project contract may help all the parties involved to evaluate, shift, or price risk in order to asses the success of overall projects and financial well-being of the parties (Ripeon, 2015).

Keep No Promises and Warranties

As operational performance is the ultimate requirements of a Green Infrastructure Mega Project, therefore, a measureable performance standard shall be mentioned in the contract and not only vaguely implied. It is essential to recognize and articulate the required design complexity to meet a certain Green Infrastructure standards that may affect the project schedule. Contractors are suggested to avoid giving promises or warranties in regards to the operational performance of Green Infrastructure. A measureable performance shall go beyond green infrastructure certification. The measureable performance should serve as a tool to evaluate the building performance after completion of construction.

Moreover, it is suggested that a commissioning period is included in a contract to test the system performance and to ensure that the project is delivered

as promised by reducing: 1) operating cost, 2) energy cost, and 3) operation and maintenance cost (Ripeon, 2015). Lastly, a detailed scope of work and the extent to which contractors will be responsible shall also be included in the contract Dunn (2010).

Ensure Certifications of All Personnel

It is suggested that contractors require all of their personnel to be certified. A Certification for Green Infrastructure Professional has been published by trade groups, universities, suppliers, and government agencies, such as: Watershed Management Group, Pratt Institute, Green Living Technologies, and USGBC. A certification is important to familiarize personnel with standardization implementation of Green Infrastructure technique and ability to perform adequately. This standard of professionalism will protect architects and engineer to maintain their professional standard of care and cover them from liability for negligence performance (Harvard Law School, 2014).

C. CONCLUSION

It is undoubted that Green Infrastructure Mega Project is necessary to sustain human living and earth sustainability. A high investment in the Mega Project of Green Infrastructure will surely increase potential legal dispute, such as: responsibility to obtain Green Infrastructure certification, failure to performs the benefits promised, and non-certification of operational & maintenance personnel. Therefore, ways to mitigate the risk is suggested namely: clearly defined risk allocation, no promises or warranties inside the contract that cannot be fulfilled, and ensuring certification of all personnel.

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