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Navigating the social dimension of sustainability decision making of mega-projects

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Abstract

Until recently, sustainable development was perceived as essentially an environmental issue, relating to the integration of environmental concerns into economic decision-making. As a result, environmental considerations have been the primary focus of sustainability decision making during the economic development process for major projects, and the assessment and preservation of social and cultural systems has been arguably too limited. The practice of social impact and sustainability assessment is an established and accepted part of project planning, however, these practices are not aimed at delivering sustainability outcomes for social systems, rather they are designed to minimise 'unsustainability' and contribute to project approval. Currently, there exists no widely recognised standard approach for assessing social sustainability and accounting for positive externalities of existing social systems in project decision making. As a result, very different approaches are applied around the world, and even by the same organisations from one project to another. This situation is an impediment not only to generating a shared understanding of the social implications as related to major projects, but more importantly, to identifying common approaches to help improve social sustainability outcomes of proposed activities.

This paper discusses the social dimension of sustainability decision making of mega-projects, and argues that to improve accountability and transparency of project outcomes it is important to understand the characteristics that make some communities more vulnerable than others to mega-project development. This paper highlights issues with current operational level approaches to social sustainability assessment at the project level, and asserts that the starting point for project planning and sustainability decision making of mega-projects needs to include the preservation, maintenance, and enhancement of existing social and cultural systems. It draws attention to the need for a scoping mechanism to systematically assess community vulnerability (or sensitivity) to major infrastructure development during the feasibility and planning stages of a project.

Keywords: mega-projects, social systems, sustainability decision making, community vulnerability

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1. Introduction

Until recently sustainable development has been primarily perceived as an environmental issue, and the social dimension of sustainability has commonly been recognised as the weakest 'pillar' of the sustainability platform (Lehtonen, 2004). In fact, it was not until the late 1990s that social issues were taken into account within the sustainability agenda (Colantonio, 2007). As a result, the management of natural capital and its measurement during the economic development process has been a key aspect of the standard approach to sustainable development, and the assessment of social and cultural capital has been arguably too limited (Missimer, Robèrt, Broman & Sverdrup, 2010). This is especially significant for large infrastructure projects which have a global track record of social benefit shortfalls, cost overruns, and underestimation of risks (Flyvbjerg, 2009). Major industrial and infrastructure projects that cost more than US$1 billion are typically called mega-projects. Globally, investment in mega-projects from the public sector alone has exceeded $5 trillion in the last five years (Flyvbjerg, 2009). With so many projects in the pipeline - and many taking place in emerging economies – the effectiveness of sustainability and impact assessment process is particularly important.

Many industries and private companies worldwide have acknowledged the need for, and the benefits of including sustainability as a key consideration in the design, delivery and operation of major projects, however, the main focus in this endeavor remains unclear. A study of social and environmental disclosure in the mining industry, for example, revealed that as there are no generally accepted auditing or accounting standards for reporting or reviewing sustainability performance information (Jenkins & Yakovleva, 2006). Auditors typically select commonly used indicators such as the level and severity of safety and environmental incidents, energy and water use, and carbon dioxide emissions. *Anything that falls outside of the scope of the auditor is not verified, particularly social indicators, which are harder to quantify* (Jenkins & Yakovleva, 2006).

Although the practice of social impact and sustainability assessments are established and accepted parts of the decision-making process, very different approaches for assessing the impacts on social systems are applied around the world, and even by the same organisations from one project to another. This situation is an impediment not only to generating a shared understanding of the dimensions of social sustainability as related to major industrial and infrastructure projects, but more importantly, to identifying common approaches to help improve social sustainability outcomes of proposed activities. For many projects, at the operational or tactical level, the focus of sustainability assessment remains predominantly seen as performance against a simple checklist**.** Often, it seems that sustainability issues are pursued more coincidentally than with a clear strategy. Depending upon a company's core business, these positive sustainability efforts can be several orders of magnitude smaller than the (potentially negative) impacts of the core business (Missimer et al., 2010).

Governments are now acknowledging this gap and new requirements are emerging such as Infrastructure Australia's strategic assessments of proposed infrastructure (Australia, 2009). A number of approaches are being trialled to address the necessary strategic assessment that incorporates sustainability principles; however, there is no targeted approach for assessing community vulnerability (or sensitivity) to mega-project development. With no sound legislative drivers or explicit requirements for social sustainability impact assessment practice at Commonwealth or State levels, the impetus for sustainability assessment remains largely in the hands of industry proponents, driven by their commitment to their respective Corporate Social Responsibility (CSR) policies.

What are the variables or characteristics that make some communities more vulnerable than others to mega-project development? Not all communities react in the same way to large scale industrial or infrastructure development. Communities, just like individuals, respond to stress in a variety of ways. The adaptive capacity of the community is not merely an additive result of individual responses but rather an interplay of unique capacities the community embodies prior to the onset of the project (Sherrieb, Norris & Galea, 2010). Given increased public scrutiny to major projects, as well as industry's commitment to socially responsible business practice and sustainable decision making, this paper discusses the importance of understanding the characteristics that make some communities more vulnerable than others to mega-project development, and the need for an effective, systematic method for assessing community vulnerability during the feasibility and planning stages of a project.

2. Mega-projects and the Sustainability Decision Making Process

Mega-projects are large infrastructure investment projects, typically defined as costing more than US$1 billion. These projects tend to attract high level of public attention or political interest because of substantial direct and indirect impacts on the environment, community, and budgets (Altshuler & Luberoff, 2003).

Mega-projects include, but are not limited to bridges, tunnels, highways, airports, seaports, railways, power plants, dams, wastewater projects, oil and gas extraction projects, mining projects, information technology systems, aerospace projects, weapons systems, large-scale manufacturing and waterfront redevelopments. The risks associated with mega-projects are substantial and cost overruns of over 50% are common (Flyvbjerg, Bruzelius & Rothengatter, 2003). Similarly, many mega-projects experience substantial economic and social benefit shortfalls. Differences between estimated and actual outcomes for regional development effects, as well as environmental and social impacts are pronounced (Flyvbjerg, Garbuio & Lovallo, 2009). Despite the risks, and poor performance record in terms of costs and benefits, more and bigger mega-projects are being planned and built worldwide. Over half of infrastructure investments are now taking place in emerging economies, and Morgan Stanley predicts that over this decade emerging economies will spend $22 trillion in today's prices on infrastructure (Flyvbjerg, 2009). In addition to issues related to risk and financial uncertainty (Flyvbjerg, 2007), mega-projects are also often associated with adverse and irreversible impacts affecting the local environment and dependent populations living in the project area (Harris, 2003).

World's Best Practice and the sustainability platforms of most CSR policies require the consideration of how any given project proposal or plan would impact on the environment and society. For mega-projects, cost-benefit analyses and environmental and social impact assessments (EIA and SIA) are typically at the core of documentation and decision making process (Flyvbjerg, 2009). These standardised approaches are not designed to account or value the positive externalities that flow from the 'goods and services' provided by the social and cultural systems of the community, (such as, family cohesion, community resilience, social networks, stewardship for the land, and cultural identity). Over the years, business, corporate and research sectors have developed numerous sustainability assessment tools and techniques that can be framed within the CSR and sustainability design initiatives (Singh, Murty, Gupta & Dikshit, 2009). These tools typically incorporate social, economic and environmental concerns into a single metric and are based on the integrated assessment approach with the aim to minimise 'unsustainability', or to achieve triple-bottom-line objectives (Colantonio, 2011). Finding a meaningful way to aggregate social, environmental, economic and institutional metrics into a composite index that can be compared at both spatial and temporal levels has proven difficult (Keirstead & Leach, 2008; Pope, Annandale & Morrison-Saunders, 2004).

Critics of the integrated assessment approach highlight the fact that societies, economies and ecosystems are complex adaptive systems that cannot be fully captured through a single lens, and call for the adoption of diverse methods and metrics rather than a single sustainability index (Gasparatos, El-Haram & Horner, 2007). In addition, proponents of 'assessment for sustainability' point out that project proposal should not be assessed for their contribution to sustainability, but to determine whether or not they are, in themselves sustainable (George, 2001).

3. Sustaining Social Systems

To improve accountability and transparency of project outcomes, and reduce risk, the sustainability of social systems needs to be incorporated into decision making process of mega-projects. The challenge is not to fall back on the typical strategies historically used to address the social dimension of sustainability in project decision making. More often than not, the performance measures of the social dimension of sustainability are primarily based on job creation and safety records as related to the project, as well as monetary contributions and compensation made to the community. Although noble in their own right, these strategies are not designed to deliver long term social sustainability outcomes for the community affected by the project.

The starting point of assessment for sustainability during the decision making process of a mega-project should answer the question – "What is to be sustained as part of this project?" The original concept of sustainable development, the Brundtland definition - *"Meeting the needs of the present without compromising the ability of future generations to meet their own needs"* (Brundtland, 1987) urges us not to degrade the ecological and social systems upon which we all depend. Furthermore, sustainable development discussed in literature focuses on the relationship of what is to be sustained (namely ecological and social systems) and what is to be developed, (namely the economy and society) (Hawken, Niznik & Institute,

1992) (Anielski, 2002). Preserving ecological systems is now a key normative goal of environmental decision making; however, preserving social systems and the intangible goods and services they provide to society is not yet common practice (Thompson Jr, 2008).

It is largely understood that if the sources of life support on earth are not sustained, the life of many species including humans will be threatened. Sustaining sources of life support includes preservation of the environment, biodiversity, ecosystems, natural resources, and ecosystem services (Bolund & Hunhammar, 1999; Boumans et al., 2002; Costanza et al., 1998; Daly & Farley, 2010). Ecosystem services refer to *benefits or goods and services that humans recognize as obtained from ecosystems that support, directly or indirectly, their survival and quality of life* (Costanza et al., 1998).

Over the years, in an effort to preserve ecological systems, numerous approaches for valuing ecosystem services have evolved. For example, the ecosystem services approach (EsA) has been developed as a strategic and tactical framework for taking account the services provided by ecosystems within decision making (Fish, 2011). The EsA development began as a theoretical framework in the early 1990s as a way to address the conservation of valued ecosystem services and has steadily evolved into policy and practical applications (Haines-Young & Potschin, 2010). Variations of this concept have emerged, such as, Valuing Ecosystem Services (VES) scheme and Payment for Ecosystem Services (PES). The basis of these frameworks is the natural environment's contribution to human well-being. In another words, avoiding the basic destruction of ecological systems is currently an acceptable starting point when planning major projects, the same fundamental premise, however, is not always applied for social systems.

Social systems are highly developed human constructs, and in addition to having roots in evolutionary social biology, these systems include, but are not limited to; networks, groups, relationships, and cultural ties and are derived from communities, families, cultural groups, and geographic factors. While ecological systems are mostly a result of evolutionary processes, social systems invariably contain different layers of complexity. Community identity is related to culture, groups, networks and sense of place. Personal identity is often secured through family structure and the ability to maintain a culture within the larger society (Margalit & Halbertal, 2004). Communities are complex web of relationships between a set of individuals who share norms, values, history, and identity, and to the extent these are threatened, the community is threatened (Folke et al., 2002). In addition, traditional and long standing social and cultural systems often evolve to become ecologically restorative in their techniques and interactions with the natural environment, (Mann, 2005) (Diamond, 2006).

When it comes to the sustainability of social systems what are some of the key factors to consider? The concept of social sustainability is broad and multifaceted, and has been examined by numerous disciplines and across various contexts. It includes, but is not limited to socio-cultural, socio-institutional, socio-economic, and socio-environmental dimensions of sustainability (Colantonio & Lane, 2008). Based on the extensive literature review of definitions of social sustainability, it is suggested that sustainability of the community can be preserved and maintained with the presence of the following components:

- Capacity to improve quality of life – (sustained and self-directed access to opportunities to meet basic human needs
- Concern for wellbeing of future generations
- Care of social equity and social justice issues
- Recognition of the relationship between natural and social capital
- Support and preservation of cultural dynamics

It is understood that these components are dynamic social change processes and are directly dependent on the social systems and culture within which a project is imbedded. Furthermore, the ecological economics perspective of 'strong sustainability' highlights that quality of life is dependent on all capitals (stocks of assets - natural, built, human, and social) and their systemic interaction - (Costanza et al., 2007) and that each capital is of inherent value and investment in one will not compensate or substitute for lack of investment or loss in another (Costanza et al., 1998).

Based on the above perspective, and the multifaceted concept of social sustainability, it can be concluded that social systems should be sustained as part of responsible business practice. And the starting point for project-planning and sustainability decision making of mega-projects, in addition to environmental considerations, needs to include the preservation of existing social and cultural systems.

4. Incorporating the Adaptive Capacity of the Community into Decision Making

Not all communities react in the same way to large scale industrial or infrastructure development. The resilience and sensitivity to changes and impacts associated with the development of a mega-project is unique to each community. This is due to the variance in social, cultural and ecological factors from community to community. Just like individuals, communities have the tendency to respond to stress in a variety of ways (Sherrieb et al., 2010). The adaptive capacity of the community is not merely an additive result of individual responses but rather interplay of unique capacities the community embodies prior to the onset of the project. The ways in which various social change processes are perceived or valued depends on the social context of the community. Some sectors or groups in society are able to adapt quickly and seek out opportunities that arise from the new situation, others are less able to adapt, and will therefore, bear most of the negative consequences of change (Vanclay, 2002).

Gellert and Lynch (2004) describe mega-projects as spatially situated and inherently displacing and analytically divide them into four types: (i) infrastructure (ports, railroads, highways, water treatment facilities), (ii) extraction (minerals, oil and gas), (iii) production (dams, power plants, pipelines and petrochemical plants) and (iv) consumption (real estate developments, malls, tourist installations). These project types can often occur in combination. Mega-projects require coordinated flows of international and state finance capital, involving public and private partnerships, the use of sophisticated technologies and heavy equipment. (Gellert & Lynch, 2004).

Mega-projects transform landscapes rapidly, intentionally and profoundly, and involve not only the displacement of dirt, substrate and other geological or hydrological patterns, but the displacement of people, communities and workers (Gellert and Lynch, 2003). Displacement refers to the ways in which human and bio-geophysical elements in the landscape interact and change as mega-projects are introduced. Due to the global pace of development over the last four decades many communities, particularly in developing countries and rural areas, have been separated from their productive assets and homesteads on account of large-scale infrastructure projects launched by public and/or private sector parties (Downing, 2002; Lehrer & Laidley, 2008; Sharma, 2003). Despite programmes and policies addressing rehabilitation, resettlement and compensation, the social costs of displacement are high, particularly for communities that are more sensitive to industrial development. The stresses incurred as the result of loss, or threat of loss to productive assets and community ties are significant and long lasting. Communities that are ill-prepared for the disruption of a mega-project socially and culturally can suffer great impacts that might cause less harm elsewhere (Loney, 1995).

People living in communities affected by mega-projects face the uncertainty, as well as the reality of being separated from their productive assets (particularly land) and homes, and in many cases, their traditional sources of livelihood and social networks (Sharma, 2003). Whether in rural or urban areas, the process of land acquisition for large-scale infrastructure and industrial projects directly affects the displacement of people from their productive assets. Communities relying on traditional sources of sustenance are particularly affected. As Loney (1995) points out; *"The consequence of mega-project impacts which damage the resource base and affect harvesting activities extends far beyond the continuing availability of a plentiful source of nutritious food".* Some of the consequences include: disruption to socialisation patterns and the family unit, damage to self-esteem, decreased sense of security, and weakening of the native economy.

Previous research, especially in post-technological disaster settings, has demonstrated that resource loss and/or threat of loss – particularly over time – combine to create individual stress and collective trauma that affect the capacity of the community to generate and sustain social capital during the very time when trust and positive relationships are critical (Ritchie, 2012). Also, social capital, as described by Norris et al. (2008), has been found to exhibit a set of adaptive capacities that can support the process of community resilience to maintain and sustain community health. However, capturing the relationship between economic and socio-cultural structure of the community and its ability to withstand a mega-project event, and incorporating that into the decision making process has not been proposed until now.

This paper suggests that systematically assessing community vulnerability (or sensitivity) to large-scale infrastructure development is a necessary first step of the sustainability decision making process for mega-projects, and asks; what are the variables or characteristics that make some communities more vulnerable than others to mega-project development? . Further research is required to ascertain which socio-cultural and socio-economic characteristics contribute to the adaptive capacity of the community to withstand a mega-

project event, and the best way to incorporate these as part of a scoping mechanism that is objective, scalable and transferable.

5. Conclusion

Major infrastructure projects play a significant role in influencing Australian and global environmental, social, and economic outcomes. Evidence in the literature supports that research is required into the methodological approaches for improved social sustainability outcomes of mega-projects.

Displacement and landscape transformation are inherent in mega-project development (Gellert and Lynch, 2003). Communities affected by mega-projects are faced with challenges associated with changes in access to resources and perceived loss or threat to resources. These include, but are not limited to: loss of traditional livelihoods, erosion of community networks that were built up over generations, effect on the family unit, and marginalisation of some sectors of the population. Previous research has shown that diminished social capital can exacerbate individual stress and collective trauma. Understanding the characteristics that make some communities more vulnerable than others to mega-project development can improve the effectiveness of social impact and sustainability assessment studies leading to better impact predictions, thereby reducing potential collective trauma. In addition, for large infrastructure projects, when it comes to decision making, better accountability that is reflective of all systems, is not only important for better project outcomes, but can also help improve forecasting techniques and identify risks (Flyvbjerg, 2009).

This paper highlighted that the starting point for project planning and sustainability decision making of mega-projects needs to include the preservation, maintenance, and enhancement of existing social systems, and proposed that systematic assessment of community vulnerability (or sensitivity) to major infrastructure development during the feasibility and planning stages of a project can improve accountability and transparency in project decision making, thereby improving the social sustainability outcomes of the project.

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