

POTENTIAL FACTORS TO PROMOTE SUSTAINABLE PROCUREMENT IN ROAD INFRASTRUCTURE PROJECTS

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The Indonesian government has promoted the sustainable procurement method regarding the selection of professional planning consultants and main contractors to construct sustainable road infrastructure projects. However, sustainable procurement practice continues to make it difficult to select service providers considering their lack of knowledge and expertise in sustainable infrastructure projects. This paper performs a literature review which includes a review of the government rules and identifies the factors which influence successfully adopting sustainable procurement in Indonesian road infrastructure projects. The review, including lesson learned from other countries, suggests factors which can promote the successful implementation of sustainable procurement: environmentally friendly specifications, producing economical goods and services during the project lifecycle, empowering local societies and small industries, reducing negative impacts on health, air, water, and soil, implementing public-private partnership or private finance initiative methods for a better partnership between the public and private sectors, and requiring assessment methods to initiate and implement sustainable procurement from pre-project planning to project delivery. The review will provide practical knowledge among road infrastructure projects' stakeholders, hence significantly affecting the adoption of the sustainable procurement process throughout the road infrastructure project lifecycle, as an example.

Keywords: Critical points, Assessment, Economic, Social, Environmental aspects.

1 INTRODUCTION

Sustainability has experienced increasing interest from the media (Thogersen 2006) and has recently been acknowledged as a requirement in many boardroom programmes, rules (Zhu and Sarkis 2007) and contests (Nikolaeva and Bicho 2011). Moreover, sustainability has become an issue of debate for stakeholders in a number of ways (Eesley and Lenox 2006). Therefore, all governments, organizations, and industries have admitted pursuing strategies to implement this concept. After the 2002 World Summit on Sustainable Development, in regard to promoting public procurement policies which advance sustainable development, various governments have established agendas and enacted rules to achieve sustainable development goals (Walker and Brammer 2009, Agarchand and Laishram 2017). Procurement plays a crucial part in promoting innovation to support sustainable development (Knutsson and Thomasson 2013). Public procurement sustainable innovation and the importance of individuals during construction projects' lifecycles guides sustainability results (Hardy 2013).

Currently, public works development, especially road infrastructure projects, have started to observe and adopt the principles and concepts of sustainable construction road infrastructure projects which contribute to greenhouse gases (GHG) emissions. One tool used to implement sustainable construction is sustainable procurement, whereby economic, environmental and especially social aspects feature prominently. Sustainable procurement has been proven for organizations to achieve their requirements to procure goods/ services and which is conducted by assessing the entire construction process starting from planning, construction and service life (lifecycle cost) by deliberating the factors which achieve long-term value for money and directly establishes ongoing benefits for the economy and society, while reducing environmental harm (Berry and McCarthy 2011, LKPP 2013). Sustainable procurement is an objective to aspire towards the environmental goal of supporting contractors to achieve additional benefits in regard to gaining a contract (Uttam *et al.* 2012). Therefore, in the procurement method, procedures for promoting a contractor to exert additional efforts should be proposed as one of the principal elements of environmental strategies (Sanchez and Hampson 2012).

The Indonesian government has issued Presidential Law Number 16 of 2018 in regard to the Government Procurement of Goods and Services. However, there is still an absence of obedience towards best practices, standardized processes and sustainability procurement procedures in Indonesia's road infrastructure projects. Therefore, the aim of this study is to identify which factors can successfully increase the implementation of sustainable procurement in road infrastructure projects in Indonesia. This starts by conducting a review of government rules regarding sustainability procurement and, is followed by best practices of the procurement method, which provide practical knowledge for policymakers and sustainable procurement participants.

2 EXISTING GOVERNMENT PROCUREMENT METHODS

The procurement method used in construction projects, particularly road infrastructure projects, is formed of a traditional and integrated approach (Design Build, PPP and PFI). The Indonesian government's goods and services procurement system is still improving. The Government Goods and Services Procurement Policy Board has utilized information technology (IT) such as e-buying, e-catalogues, and e-tendering. Using sustainable procurement (SP) in the government's goods and services procurement introduces innovations from The Government Goods and Services Procurement Policy Board. The United Nations Environment Program (UNEP) defines SP as a method whereby a public institution meets their need for services, goods, utilities, and construction to gain value for money for the benefit of users and the community, while extensively reducing the adverse impacts on the environment throughout the entire lifecycle. This is in line with the Indonesian Government Law Number 16, 2018.

Sustainable government procurement of services and goods requires the fulfilment of three aspects: environmental, social, and economic. Environment aspects cover reducing the negative impact on health, air, water and soil quality improvement, and consuming natural resources according to legal provisions. Social aspects involve empowering small industries, guaranteeing good working circumstances, fairness, diversity, and empowering local societies and industries. Economic aspects involve the cost of producing goods and services during the lifecycle. Applying SP covers the product procuring process purchased by the government, the services implementing government processes, and the product produced using the sustainable public procurement (SPP) concept. There are a number of advantages to implementing SP. Encouraging SP implementation covers financial efficiency, accelerating societal goals, reducing greenhouse gas emissions, driving innovation, policies commitment, increasing supply chain

competitiveness, and fulfilling environmental goals. The problems with implementing SPP include underdeveloped procurement regulations, lack of public awareness, high prices for green products, and lack of leadership commitment.

3 BEST PRACTICES OF SUSTAINABLE PROCUREMENT

Many countries have used procurement methods to implement sustainable development. The UK Government has provided 68 considerable indicators to evaluate the sustainability performance of a nation (DEFRA 2007, DEFRA 2008). The indicators are classified into four priority parts: sustainability of consumption and production; creating sustainability of societies and a fairer world; energy and climate change; protection of natural resources and environmental improvement. Private finance initiatives (PFI) have, since 1992, been a popular and recent UK procurement method. The increased revenue rate could be provided using the PFI method compared to the traditional method, especially in the long term for the private sector. Moreover, the PFI could offer improved partnerships with the public sector (Zhou *et al.* 2013).

PFI and its upcoming variations may be significant methods for the UK Government to achieve their sustainable development goals. PFI indicates real range to encourage sustainable construction (Addis and Talbort 2001). The PFI system can be applied as a control to progress the UK construction sector towards more sustainable products and practices (Hill and Collins 2004). The public sector has recognized the natural association between sustainable development and the PFI method. However, a lack of useful instruments exists for supporting decision-makers for the measurement and integration of sustainability throughout procurement processes. In a study conducted by Zhou *et al.* (2013), a sustainability assessment framework was developed for the PFI method. In the PFI method, achieving sustainability requires four elements to be balanced: social, economic, environmental and technical.

Gelderman *et al.* (2006) and Walker and Brammer (2009) developed a conceptual framework comprised of factors which influence sustainable public procurement. It begins when sustainable public procurement increases as a result of the power to embark it. The framework suggests four major aspects affecting the level of SP implementation, namely the informational aspect of implementing SP to understand the concept of SP and government policies; financial aspects related to budget; organizational pressure related to organizational culture; and supplier availability. Walker and Brammer (2009) conducted a survey which resulted in facilitating factors to further development of sustainable procurement. These factors are top management support, procurement process (contractual requirements, prepared bid documents, pre-qualification clauses, purchasing conditions, qualifying processes, developing specifications inherent processes, outsourcing, entire life costing, invest to save), government policy, presence of stakeholder, statute, work with supplier, personal responsibility, sustainability plan, procurement strategy, affordable, team commitment, awareness, alignment with organizational goal, procurement training, guidance, ISO 14000, incentives of procurement staff, products availability, government assessment and centralized assistance.

In implementing sustainable procurement, some issues need to be addressed. Many researchers have investigated obstacles to the procuring of sustainable innovation, for example: personal aspects of affective and cognitive character; institutional aspects as managerial control, institutional culture and structure, an absence of interface with other procurement groups; use of inflexible outcome-based specifications; unskilled competencies of procurers; absence of instruction provided to the procurer; group adjustment processes; burdensome prequalification process and conditions; and poor risk management (Green 2010, Preuss and Walker 2011, Uyerra *et al.* 2014).

The Government of India has commitment to sustainable development principles and goals (MoEF 2011). They have enacted policies and programmes to accomplish commitment towards society, economy and the environment. For example, to accelerate economic growth, the Indian government has constructed critical infrastructure such as highways, roads, harbours, power and urban infrastructure through a public-private partnerships (PPPs) method that involves private sectors. PPPs allow governments to construct the key infrastructure in cash-strapped situations. However, there have been several issues which have negatively affected achieving sustainable development objectives when procuring using the PPP method (Agarchand and Laishram 2017). El-Gohary *et al.* (2006) states that the involvement of SP in PPPs is based primarily on a profit-making mindset and critical sustainability issues not found when using the traditional procurement method. The main standards needed for encouraging sustainable development objectives are intra-generational and inter-generational equity. PPPs are unable to protect the community's interest in respect of these standards (Clifton and Duffield 2006).

Agarchand and Laishram (2017) found key challenges in the Indian PPP procurement process, including: future unforeseen issues not accounted for in SIA (social impact assessment) and EIA (environmental impact assessment); risk allocation which does not account for future unpredicted impacts; higher client costs for infrastructure facilities; increased tender and operational costs to SP; lack of stakeholders and local community participation; conflicts of objectives between communities and SP; a lack of transparency and accountability throughout the tender process; insufficient WLC costing in value for money analysis; lack of proficiency and understanding of sustainability concepts; and incomprehensive bid evaluation criteria. To overcome the key challenges, Agarchand and Laishram (2017) proposed factors which can promote sustainable public procurement success, including emphasizing mechanism advancement, revision of government policies and support systems and enhancement to governance structure. Matar *et al.* (2008) suggested using sustainability standards as elements of project delivery from pre-planning of the project to structure completion. In assessing sustainable procurement, the basic procurement processes, as defined by UNDP (2008), are a suitable foundation evaluating the framework. The sustainable project procurement lifecycle covers three primary stages driving determinations which impact GHG emissions from road construction, operation, and maintenance (Sanchez *et al.* 2014). The lifecycle is comprised of: strategic planning phase (policies and strategies; and information and prequalification), project development phase (project assessment; tender and contract; multi-factor bidding assessment) and the project implementation phase (project supervising and control; and feedback and renewal).

The gaps discovered in the Australian state road agency's sustainable procurement procedures covers an absence of best practice, standardized technique and strategies for GHG reduction and assessment; poor GHG assessment integration; lack of management methods and policies for an interdisciplinary teamwork; insufficiency of environment standards in designer and builder choice; inadequacy of incentive for GHG contract reduction; and incomplete supervising, control and evaluation procedures (Sanchez *et al.* 2014). These gaps can be addressed by a series of standardized guidelines and mechanisms for GHG reduction and assessment via global assessments and involving multi-disciplinary partnership between clients, engineers, builders and scientists; connecting GHG reduction and assessment with the overall framework of project risk management; announcing non-financial aspects of environment impacts as project planning and builder selection devices; effective incentives for GHG reduction to be included in contracts for road construction; and effective GHG emissions standard, supervising and evaluating. Table 1 summarizes the practices of sustainable construction and infrastructure procurement in United Kingdom, India, and Australia.

Table 1. Practices of sustainable procurement in several countries.

Sustainable procurement methods	Countries	Best practices	Challenges
Private finance initiatives (PFI)	UK	Improved partnerships with the public sector (Zhou <i>et al.</i> 2013); encouraged sustainable construction (Addis and Talbort 2001); as a control system (Hill and Collins 2004).	A need for a sustainability assessment framework (Zhou <i>et al.</i> 2013).
Public-private partnerships (PPPs) policies	India	Involvement of private sectors, especially in cash-strapped situations (MoEF 2011).	Lack of social and environmental impact assessment (Agarchand and Laishram 2017).
Greenhouse gasses (GHG) assessment	Australia	Multi-disciplinary partnership between clients, engineers, builders, and scientists (Sanchez <i>et al.</i> 2014).	A need for guidelines and mechanisms for GHG reduction, and GHG reduction incentives (Sanchez <i>et al.</i> 2014).

The Indonesian government has made an effort to start implementing sustainable procurement method in Indonesian road infrastructure projects. This study has provided potential factors to promote sustainable procurement covering either best practices or issues that have negatively affected sustainable procurement, particularly for road infrastructure projects.

4 CONCLUSION

Adopting sustainable procurement in the construction of Indonesian road infrastructure projects is expected. Relying on sustainable government procurement for services and goods requires the fulfilment of economic, social, and environmental aspects; the study suggests factors which can promote the successful implementation of sustainable procurement: specifications must be environmentally friendly and energy efficient, producing economical goods and services during the project lifecycle, empowering local societies and small industries, and reducing negative impacts on health, air, water, and soil. In addition, this study concludes with critical points that emphasize the need for competent and experienced service providers by implementing public-private partnership (PPP) or private finance initiative (PFI) methods that could offer a better partnership between the public and private sectors. Finally, sustainable procurement adoption requires assessment methods to initiate and implement sustainable procurement from pre-project planning to project delivery. The assessment elements must include social, economic, environmental and technical issues, greenhouse gasses, low maintenance cost, health and safety, whole life costing, capital costs, energy consumption throughout the operation, environmental impact assessment, and social impact assessment. On an ongoing basis, elements of sustainable procurement requirements will increase. Therefore, commitment to road infrastructure projects by stakeholders and awareness from the public should be the initial trigger for adopting the process and prioritizing the factors, critical points, and assessment elements of sustainable procurement.

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