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# Coping with strategic ambiguity in planning sustainable road development: balancing economic and environmental interests in two highway projects in Indonesia

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## ABSTRACT

In planning regional road development, planners often face a challenge to reconcile various interests and interpretations on the ultimate goals which complicate the discussion decision-making processes. This situation is defined as strategic ambiguity. Standard procedures for impact assessment are mostly ineffective at offering solutions that satisfy all involved stakeholders. This paper analyses the situation by using a Multiple Stream Framework (MSF) approach. MSF identifies three factors, labelled ‘streams’, i.e. the problems, the solutions, and the politics streams, that open sustainability ‘windows’ for integrating different interests. This paper investigates the opening of such windows in two highway projects in Indonesia. Both projects showed a high ambition for achieving environmental sustainability. In these cases, the window was opened through (i) recognition of the problems and the solutions by the active involvement of stakeholders, (ii) coalitions with influential stakeholders for political supports, and (iii) mobilization of resources and policy networks by the stakeholders. It is concluded that planners might influence the streams to outline decision-making processes and to implement environmental impact assessments effectively.

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## KEYWORDS

EIA; large-scale infrastructure projects; sustainability; multiple streams framework; qualitative data analysis; Indonesia



## Introduction

Since the 1980s, there has been growing attention to applying the sustainability concept in many areas, including transport projects. In general, sustainability can be thought of as relating to the comprehensive consideration of environmental, economic, and social aspects, with a long-term perspective (Ramani et al. 2011; Gudmundsson et al. 2016). In this paper, a transport project will be considered ‘sustainable’ when it contributes to favour economic development and fulfil the transportation needs of the society in a manner consistent with environmental protection (Bueno et al. 2015).

By such a definition, a sustainable road project entails the integration of multiple, often conflicting, social, economic, and environmental interests. In developing countries, in particular, road development is intended to connect isolated regions and to enhance economic growth through better people mobility (Gartner 2016). In contrast, environmental interests, such as species habitat loss and massive landscape change, are rarely considered at the heart of discussions in the planning phase. Several stakeholders, such as NGOs, local communities, and other affected people, have become increasingly engaged in decision-making so that their long-term interests are better secured (Howitt 2013). Project developers often

struggle to mediate conflicting interests to achieve project goals or missions. These interests can be conceptualized into three aspects or pillars: (i) economic growth, (ii) social equity, and (iii) environmental protection (Jeon et al. 2013). These dimensions are not isolated with each other. Frequently, they overlap, and trade-offs occur among them (Joumard and Nicolas 2010), but their relation is often unclear in the actual application (Purvis et al. 2018).

This paper examines how the integration of economic and environmental aspects is possible in planning sustainable road development, and how environmental assessments carried out can be made effective. The most common model of decision-making is the rational (comprehensive) approach that informs all consequences, solutions, and available options. For example, EIA (Environmental Impact Assessment) is used as a routine part of decision-making by scoping and screening project impacts and define alternatives for a sustainable option (Stoeglehner and Neugebauer 2013). Planners and policy-makers also frequently rely on SEA (Strategic Environmental Assessment) (Hildén et al. 2004; Fischer 2006). In SEA of transport projects, Fischer (1999) substantiates that the integration of interests requires more effort because actors from various jurisdictions are involved, and a lack of preparation is common. Sustainability assessment (SA) is

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advanced to ensure that decision-making is comprehensive, meaning that it covers all three categories or pillars of environmental, social, and economic effects as well as indirect effects (Hacking and Guthrie 2008; Morrison-Saunders et al. 2015; Sala et al. 2015). Yet reviews on SA of transport projects also show that methods and tools applied have only partly measured the project impacts (Bueno et al. 2015; Heeres et al. 2018). As a result, a limited use appears in the implementation of such assessments, and their actual effects on decision-making are still questioned (Runhaar and Driessen 2007). Powerful stakeholders having abundant political and organizational resources may also control the decision-making processes (Salling and Banister 2009).

For the investigation, two highway projects in Indonesia are used as cases. Both were aimed at improving economic growth as the leading national development strategy ([CMEA] Coordinating Ministry for Economic Affairs 2011). However, as found in the context of developing countries, the project developers had a limited capacity to integrate short- and long-term considerations (Delphine et al. 2019a) and to mitigate the project effects effectively (Othman 2013). The planning of sustainable transport infrastructure appears ineffective because of institutional barriers, such as lack of stakeholders' awareness and time and limited skilled personnel (Regmi 2014; Pojani and Stead 2015). Such a condition encourages an incremental change aimed at establishing sustainability considerations into policies through continuous seeking of a window of opportunity (Fischer 2004). This paper, therefore, addresses the research question: *'To what extent can "windows of opportunity" assist the integration of economic and environmental interests in planning sustainable road development?'*

This paper draws on theories about policy agenda-setting by using a Multiple-Stream Framework (MSF) and its further refinement (Kingdon 2014; Béland 2016; Béland and Howlett 2016; Zahariadis 2016). This approach helps to outline the process in three different streams, i.e. problems, policies, and politics. First, the sustainability 'window' is conceptualized as a moment in which the stakeholders reach a sustainability plan proposal and successfully match their conflicting interests. Second, different elements of the three streams are investigated in which the window presents itself by using two highway projects in Indonesia as cases. Finally, this study reflects on findings and conclusions and how environmental assessment helps to assist integration.

## Conceptual framework

In this section, the concept of strategic ambiguity will be introduced, then followed by an explanation of the Multiple-Stream Framework (MSF).

## Strategic ambiguity in planning sustainable road development

Eisenberg (1984) initially uses the term 'strategic ambiguity' to describe instances in which language was deployed in such a way to accomplish organizational goals. In this paper, the concept is adopted to understand a situation in public planning and decision-making in which various interests present and complicate discussions about development project goals (see also Giezen et al. 2015). First, this situation occurs because of the level of abstraction of project goals. Large-scale development projects start with an underlying sense of purpose reflected in the strategic project goals (Giezen 2012; Salet et al. 2013). However, different framings, meanings, and expectations towards these goals might arise. Second, agreements on specific goals or choices are often challenging to achieve because of conflicting and irreconciled interpretations of interests.

The inclusion of 'sustainability' or 'sustainable development' goal into policies and plans is without exception in this regard. This goal can be considered ambiguous. Stakeholders have different meanings, frames, and expectations on what it entails and applies in implementation (Gibson 2013). The ambiguity also allows ways of creative interpretation, both as constraining and facilitating choices, which are reinterpreted continuously by the stakeholders involved in decision-making (Zahariadis 2016). If the contested interpretations are not negotiated in one single decision, they return in a later stage until all stakeholders reach a final agreement (De Bruijn and Leijten 2007). This agreement may take time to grasp. Otherwise, disagreement makes the projects fail to implement.

Three aspects reflect ambiguity in planning sustainable road development projects: (i) problematic preferences, (ii) complex decision-making processes, and (iii) fluid participation (see Zahariadis 2016 for a general explanation). First, road projects usually consist of conflicts over goals or ultimate ends. These goals are continually renegotiated in different decision arenas (Giezen 2012). Second, stakeholders rarely understand well how decision-making works, especially when it involves multiple agencies across sectors and jurisdictions (Zahariadis 2016). Public debates, scientific studies, and environmental assessments are used to justify whether project goals are viable or whether mitigation is adequate to address the impacts. However, the results of such processes might not be satisfying to all stakeholders. Third, the participation of stakeholders varies across different decision arenas. Such a situation makes a presentation in all arenas unmanageable, and particular stakeholders might be unable to influence decisions.

## Multiple-streams framework (MSF): an explanation

The Multiple-streams framework (MSF) was developed as an analytical device in policy or decision-making under an ambiguity condition (Zohlnhöfer et al. 2015;

Zahariadis 2016). In such a situation, different spheres of decision-making involve stakeholders, and policy networks and arenas affect how problems are identified and how particular solutions are preferred. Although scientific evidence is available, stakeholders might not instantly accept the offered solutions. Planning literature addresses this situation by stating that any decision-making is a bounded-rational process, in which actors have various perspectives and frames regarding the problems and the solutions (Healy 2006; Hoch 2008).

As early as 1984, Kingdon's work outlined MSF to investigate how actors involved in policy processes set agendas or proposals successfully. MSF helps to explain how a window of opportunity opens for actors to a successful set-up of the policy process. In Kingdon's MSF, three categories of independent (and interdependent) variables or elements that interact exist, namely: (i) the problems stream, (ii) the policy stream, and (iii) the politics stream. *The problems stream* pushes forward all significant issues that potentially receive attention. Some conditions cause this stream to occur, such as high-profile events (e.g. crisis events or natural disasters). Kingdon (2014, p. 114) highlights that '*for a condition to be a problem, people must become convinced that something should be done to change it*'. The second element is the policy or the solutions stream. This stream pushes all accumulated knowledge about the problems and the alternatives attached to the issues that make the windows open. To make an alternative acceptable, Kingdon (2014) elaborates some circumstances, such as feasible technical proposals, fitted to societal values, high political support, and workable budgets. The third and last element is the politics stream. This stream consists of the administrative and political dimension of the intended policy, such as political election, pressures from interest groups, and new leaders in the office.

When all these streams join in a specific moment, a window of opportunity opens to attach an agenda or a proposal into a particular policy or decision to be made. The three streams flow and remain independently until a specific point in time. The window might then open to create an opportunity to advocate the agenda in a particular period (Howlett 2018). Several reasons can explain the seeking of actors for such windows. First, stakeholders have bounded rationality and a short attention span to generate public action (Van Stigt et al. 2013). As a result, they have difficulty in keeping a problem as a public interest. Second, decision-making is a complex process as actors show diverse interests and interact in various policy networks (Van Bueren et al. 2003). These actors usually interact with each other over a relatively long period, operating within a climate of uncertainty caused by context and time-specific knowledge and information limitations (Howlett 2014). Third, unrelated arenas of decision-making influence how expected

outcomes are defined (Van Bueren et al. 2003; Van Bueren and Ten Heuvelhof 2005). Moreover, some influential actors may actively drive the result (Reardon 2018). This institutional complexity requires the stakeholders to reduce gaps in the governance context and the available policy instruments in defining problems and accepting solutions (Howlett 2009). The next section will explain how the integration of interests is attained by structuring this complex process in the case of road projects.

### ***Integrating interests by seizing a sustainability window***

Decision-making of transport infrastructure projects, specifically the large-scale ones, is an extremely complex process in which multiple stakeholders negotiate and communicate goals or missions (Giezen 2012a; Salet et al. 2013). Large sums of public money are frequently spent on research and environmental assessments, but the results often fail to drive an agreement. Planners often seek ways to hook up solutions in the assessments so that perceived problems can be resolved. In doing so, stakeholders often collaborate with others to receive support and to legitimize their solutions or selected alternatives (Scandellius and Cohen 2016). For the streams to come together, Kingdon (2014, p. 165) states: '*A problem is recognized, a solution is developed and available in the policy community, a political change makes it the right time for policy change, and potential constraints are not severe*'. Planners recognize and match the problems and the solutions, while the political streams are supportive for the integration of competing interests.

Before this integration occurs, first, planners need to identify various elements in each stream that open the window of opportunity. Figure 1 elaborates the contributing elements of each stream as described above. Figure 1 also points out the role of an actor, called a 'policy entrepreneur', which is essential to couple the streams that open the window. This actor plays a vital role in attaching solutions to the recognized problems, overcoming the constraints in implementation, and taking advantages of future benefits (Hermansen 2015). The 'entrepreneur' is willing to invest their resources, such as time, money, energy, and reputation, in return for anticipated future gain in the forms of material, purpose, or solidary benefits (Kingdon 2014). The role of these actors has been investigated in many fields, including economic policy (Ackrill and Kay 2011), climate change policy (Hermansen 2015), and urban development planning (Van Stigt et al. 2013).

The convergence of the three streams with the contribution of the entrepreneur helps the presence of windows of opportunity. The windows allow a resolution of balanced interests between stakeholders. The next section will discuss the cases and methods used to identify elements in each stream

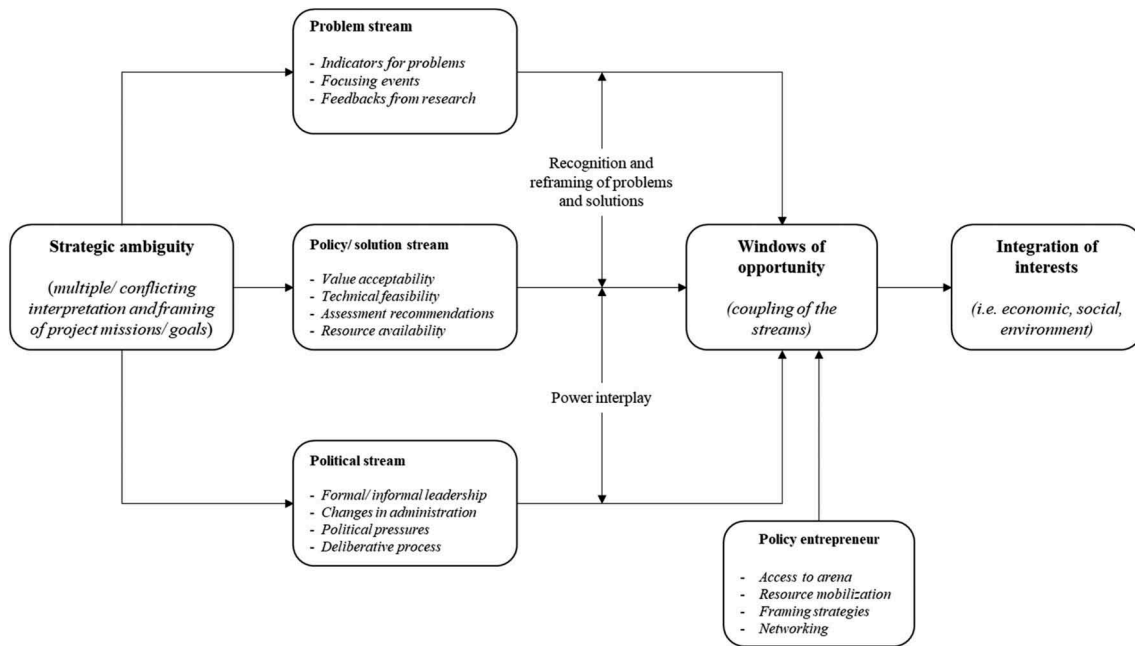


Figure 1. The analytical framework (based on interpretations of multiple sources, e.g. Kingdon 2014; Zahariadis 2016).

(i.e. problems, policies/solutions, and politics) and the role of the entrepreneur that significantly contributes to the window opening.

## Study design and case selection

### Case study design

This paper used an in-depth case study design to obtain information about the projects and to infer its broader development context (Yin 2014). A single case is chosen as a way to 'understand the viewpoints and the behaviors, which characterize social actors' (Flyvbjerg 2006, p. 236). By applying this design, we

investigated how the concept of MSF enabled the presence of windows of opportunity for integrating multiple interests. The design allowed an examination of the underlying mechanisms that connect different and interdependent elements of three streams from the data gathered.

We first collected data consisting of assessment studies, monographs, policy and project reports, then performed in-depth interviews for two project cases in Indonesia. The first case is Bali Mandara Highway, located in Bali; the second is Kelok-9 in Sumatra (Figure 2). The interviewees were selected by using a purposive sampling technique (Kumar 2014) based on active involvement in the project planning. In total, 21 potential

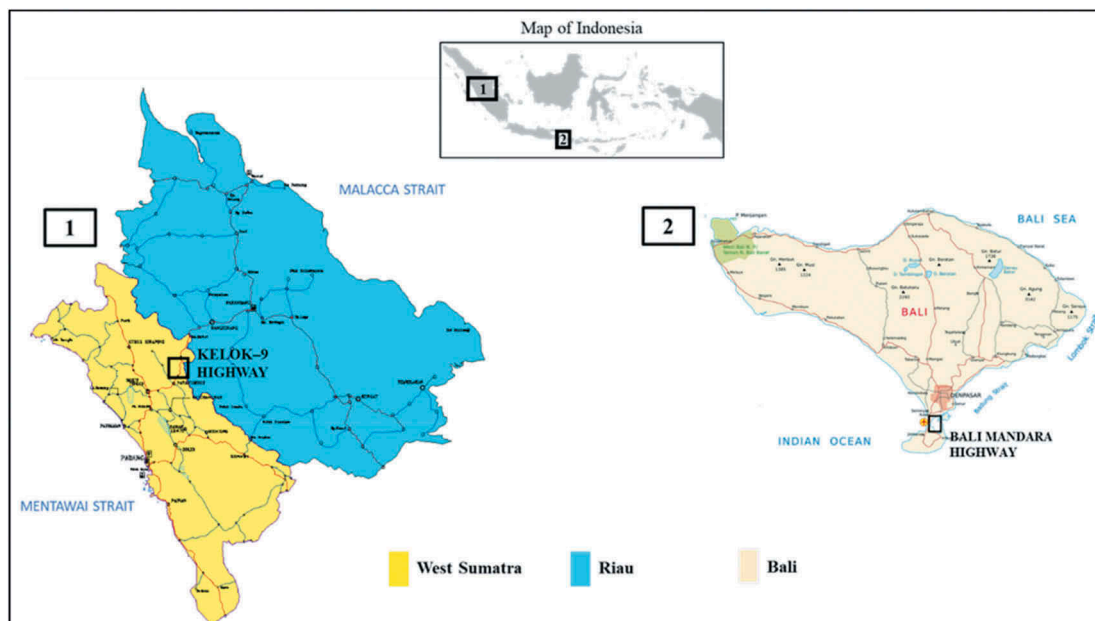


Figure 2. The location of the examined projects.



interviewees were contacted, according to the project monographs and reports. In each case, five stakeholders agreed to be interviewed and included in the study, consisting of two governmental officials, a project manager, and two planning consultants. One local leader and one NGO director were involved as interviewees for the Bali Mandara Highway case (Table 1). No local organizations and NGOs were found actively participated in the Kelok-9 Highway project planning, based on the examined monographs and reports. This contrasting participation of interviewees can be explained, as the location of Kelok-9 Highway in a remote area, and public engagement was less reported.

The series of interviews was performed from October 2017 to September 2018. In doing the interviews, a topic list guided the researchers to obtain data with regard to: (i) the project missions and the stakeholders' interests, (ii) processes carried out to resolve the competing interests, (iii) arenas and policy networks in which problems and solutions were discussed, and (iv) integration of interests achieved. All interviews were recorded by using an electronic device. Upon completion, written verbatims of the records were sent back to the interviewees for their comments and confirmation.

For the analysis, we explored 'meaningful units of information' (Silverman 2014) in the data collected and coded the information to examine (i) the competing missions and interests; (ii) the detailed elements of the three streams, i.e. problem, policy, and politics, (iii) the elements opening the 'sustainability' window, and (iv) the traits of a 'policy entrepreneur' (Figure 1). Atlas.ti software was used for coding the information. The next section will present the cases and the empirical results in more detail.

### Road development projects in Indonesia as cases

Since the 'big-bang' of decentralization in 2001, road infrastructure development in Indonesia has become highly fragmented (Darmoyono 2019). Multiple agencies, such as the spatial planning, public works,

environment, and transport departments at different jurisdictional levels, are involved in the design of road development policies and plans (Miharja and Woltjer 2010). The Local Government Act of 2014 reflects this 'complexity' of the bureaucratic structure that complicates integrated decision-making. In the Indonesian road development, sustainability is still considered a sectoral concern, which is the responsible agency for public works is mainly concerned with the mitigation of environmental impacts of the infrastructure construction (Lawalata et al. 2013).

In integrating environmental considerations into road projects, practitioners apply SEA and EIA. SEA is regulated under the Environmental Act of 2009. The public works or the spatial planning department prepares it to evaluate the socio-environmental impacts of spatial development plans, program, and policies. At the project level, EIA is prepared to mitigate adverse effects and include the measures in final designs ([MPW] Ministry of Public Works 2011a). However, EIA seems ineffective for a project planning purpose. First, it generally tends to be adopted late in the planning processes. Second, there is little room available to reflect on the selected road project; thus, the EIA results seem to legitimize the implementation, instead of adding value to the project decisions (Giovanna et al. 2006). Moreover, public engagement in the assessments are relatively low (Delphine et al. 2019aa).

Two highway projects that are selected as cases for this paper represent typical road projects in Indonesia, complicated by the involvement of agencies across different sectors and jurisdictions (Darmoyono 2019). In these projects, there are competing interests, i.e. regional economic growth (improving connectivity) and environmental protection (preserving species habitats and ecosystem integrity). The projects are both situated in nature conservation areas. The competition made it difficult for the project developers to push the implementation forward. Without balancing the economic and environmental interests, the projects would not be delivered on time, and the delays would have caused additional economic costs ([DGH] Directorate

**Table 1.** The list of interviewees.

No.	Project case	Interviewee	No. of interviewees	Interview code
1.	Bali Mandara Highway	Consortium representative (formerly the project manager)	1	A1
		Government official:	2	A2, A3
		– The Ministry of Agrarian Affairs and Spatial Planning		
		– The Provincial Government of Bali		
		Project consultant	2	A4, A5
		– Environmental consultant		
		– Spatial planning consultant		
		Local community leader	1	A6
		NGO director	1	A7
2.	Kelok-9	Project manager	1	B1
		Government official:	2	B2, B3
		– The Ministry of Public Works and Housing		
		– The Provincial Government of West Sumatera		
		Project consultant	2	B4, B5
		– Landscape consultant and university expert		
		– Road planning consultant		

General of Highways 2014; Lamade et al. 2014). The next section will explore the cases further.

### **A tale of two highway projects in Indonesia**

This section elaborates the project cases: Bali Mandara Highway and Kelok-9. For each case, the emergence of windows of opportunity is explained through the convergence of the three streams, i.e. problem, policy, and politics.

#### ***Bali mandara highway: project missions and competing interests***

The central government enacted the highway project proposal in 2006. The project mission is to *'connect the activity centers located within the metropolitan region and support the regional growth as the national activity center that focuses mainly on tourism development'* (MPW 2011b, article 7). It is also aimed at improving national competitiveness by positioning the area where the highway is located as the main logistics center at the eastern part of Indonesia ([CMEA] Coordinating Ministry for Economic Affairs 2011). The highway connected three strategic locations, an international airport, an harbor, and a tourist resort, and was built above a sea-water. The government official told the reason: *'the local building code prohibited the overpass construction [on the main arterial road] because, in the design, the pillars had a height of more than 12 meters'* (Interview A2).

Despite the economic importance, competing interests emerged between the stakeholders. First, at that time, The Provincial Water Agency had reported a massive conversion of mangrove forest into commercial and public facilities. The government official explained that *'the [project] implementation would only fasten the speed of land conversion in the area'* (Interview A3). Second, the local communities noticed that the planned route displaced several religious sites. The community leader told that relocating these sites would have only *'undermined the sacral and cultural importance to the local people'* (Interview A6). The local communities and NGOs asked the appointed project consortium to delay the implementation unless the solutions were implemented regarding the site relocation.

#### ***Paving 'roads' to sustainability: problems, solutions, and the role of EIA***

The enactment of the Metropolitan Spatial Plan 2011 consolidated the project implementation and established the vision for spatial development in the surrounding area. However, the planning consultant identified that *'there was a contradiction between the zoning in the [Metropolitan Spatial] Plan with the municipal spatial plan'* (Interview A5). It appeared that the implementation sparked an argument about the mangrove forest protection. The project consortium thus signed a Memorandum

of Understanding (MoU) with the Ministry of Forestry with an agreement to restore the forests affected by the project. To move the implementation forward, the project consortium conducted an EIA study.

After screening and scoping of the project effects, the hired consultant for the study announced the their recommendations in October 2011. The report identified fifteen important effects having priorities to mitigate, such as (i) changes in local culture and traditions, (ii) displacement of local fisheries, (iii) land-use changes, and (iv) forest mangrove removal (JM et al. 2011). The consortium then held two public meetings to gather public opinions about these identifications in February 2012, involving parliamentary representatives, government officials (i.e. national, provincial, and local administration), local leaders, NGOs and the local media. Most stakeholders agreed the implementation could be carried out if the identified social and environmental impacts were mitigated. The local stakeholder demanded that social conflict should be avoided. Therefore, the local government demanded the consortium to *'allocate jobs for the local people during construction'* (Interview A3). In the second meeting, the NGO identified an additional problem with: *'the displacement of local fisheries and community based tourism activities'* (Interview A7). These meetings turned out to be essential to define the problems and solutions before the proposal for the implementation was accepted. For the consortium, the meetings and the EIA helped them to translate the 'abstract' project mission into a detailed implementation plan that combined multiple interests of stakeholders.

#### ***Converged streams: the emergence of a 'sustainability' window***

The governor approved the final version of EIA in September 2012 (JBT 2013). As a follow-up with the local community leaders, the consortium identified the location of the religious sites and the fishery spot displaced by the project. To show concerns on the local needs, the consortium published a detailed highway design under the theme *'Strong, Green, and Beautiful'* (Karim 2016; Interview A1). From the publication, the consortium informed about the commitment to establish strict environmental standards in the implementation. The project manager explained that they deployed *'environmentally-friendly technologies to reduce the adverse [project] impacts on the landscape and to improve the pavement life-cycle'* (Interview A1). However, the environmental consultant was concerned that such a focus only moved the implementation away from ensuring its social commitment: *'the foreigners took most the [construction] jobs that should have been given to the local people'* (Interview A4).

In this case, the *problems stream* (mangrove forest protection and social conflict avoidance) and the *solutions stream* (conformance of high environmental

standard and highway realignment) joined with the steady pressure from well-respected local leaders and NGOs in the opening of the sustainability window. In collaboration with the leaders, the consortium got legitimacy and helped to ease public resistance for the implementation (Lamade et al. 2014). This pressure can be categorized as a part of the *political stream*. The consortium acted as the main actor that linked both the *problem stream* and the *solution stream* and turned out to bring opportunities in term of (i) the reduction of construction costs from minimizing land acquisition and (ii) the attractiveness of the highway site as a tourist attraction because of its surrounding protected natural landscape ([JBT] Jasamarga Bali Toll 2013). The project manager told the future benefit attained from: *'creating added social values from protecting the beautiful landscape around the highway'* (Interview A1).

In this case, the sustainability window caused the economic interest (connectivity improvement) to join with the socio-environmental interest (forest mangrove protection and land acquisition minimization). The window opened because local stakeholders participated in open discussions on the recognition of problems and solutions. Moreover, the collaboration between the consortium and the local leaders allowed joint-fact findings in the identification of displaced religious sites and the fishing grounds. The project manager successfully matched the problems and the solutions in the final plan and design, pushed by the local leader pressure in the political streams, and implemented the solutions.

### **Kelok-9 highway: project missions and competing interests**

In 1990, the Ministry of Regional Infrastructure initiated the reconstruction project of Kelok-9 Highway with a mission to relieve a bottleneck segment between West Sumatra and Riau provinces ([DGH] Directorate General of Highways 2014). Moreover, fatal accidents frequently occurred because of its hilly location. The Provincial Highway Agency reported increasing traffic passing this segment (DPJ 2001). This project consisted of three construction works: (i) road widening, (ii) bridge construction, and (iii) road re-alignment. The total length of the project is 5.0 km.

Some problems emerged before the actual implementation. First, the project was located in a protected forest, and national laws prohibited a land use change in the area. The change would have affected migration routes of native species, including seven mammals and four reptiles ([DPJ] Dinas Prasarana Jalan 2001). Some native trees needed to be cut down for the re-alignment work. The government official recalled: *"the function of the area was under a significant threat, and the implementation would have seriously offended several national laws'*

(Interview B2). The provincial government faced a dilemma. First, if the project failed to implement, the West Sumatra province would have stayed economically uncompetitive and isolated. Tourist visits and foreign investments would be below expectation (PPSB 2012). Second, in 1994, the central government was urged to accomplish the project in the meeting of IMS-GT, an international cooperation involving Indonesia, Malaysia, and Singapore. The project was aimed at enhancing economic growth in the bordering region of the three countries, also called the 'Growth Triangle' ([DGH] Directorate General of Highways 2014). The Kelok-9 Highway would connect West Sumatra with its abundant lands, labor, and natural resources with international harbors in Riau, transporting logistics and people to Johor (Malaysia) and Port of Singapore (Singapore). Two competing interests (environmental protection vs economic growth) thus complicated the project planning. The provincial government of West Sumatra hired a consultant to perform an EIA study.

### **Paving 'roads' to sustainability: problems, solutions, and the role of EIA**

The governor approved the EIA in 2002, based on the recommendation of an independent committee. The report recommended the implementing agency mitigate adverse impacts in different phases. During the pre-construction and construction phase, the agency should address water quality degradation, species habitat threats, and landscape changes. It recommended that the agency transport water for the project from outside to avoid contamination and limit the number of lands occupied for the re-alignment. In the usage phase, the report warned about the expansion of illegal tree logging and degradation of air and water quality from increasing traffic. The agency was required to control land use changes along the new segment. However, the project manager explained that at the time *'the allocated budget was insufficient for following-up on the [EIA] recommendations'* (Interview B3). In the same year, the provincial government published a feasibility study report to justify the economic importance of the project. This document reported economic benefits gained from the reduction of travel time and vehicle operating costs (DPJ 2002). It also pointed out the productivity growth of agriculture, tourism, and manufacturing sectors if the project was implemented. Still, the two reports were unable to push the implementation forward unless the status of the protected forest was changed to a construction site.

The Ministry of Forestry then issued permission to the Provincial Highway Agency to convert some lands as the project site (DPJ 2004). In 2004, and the agency signed an MoU that, according to the government official, *'established an agreement [between parties] on the protection of species habitats from land-use changes because of the project implementation'* (Interview B1). With this establishment, the Ministry of Public Works



handed over the project. The ministry specified four road and bridge routes as alternatives into an implementing plan (DGH 2005). Both the central and provincial agencies selected route alternatives and estimated the total construction cost. The Ministry of Public Works then revised the initial EIA.

### ***Converged streams: the emergence of a 'sustainability' window***

In this case, the *problems stream* concerns with the pressing issue of the status of the project site as the nature conservation area. This stream also comes from the pressing economic condition of the regions as reported in the feasibility study in 2002. The *solutions stream* originates from EIA in 2002 and the 2005 implementation plan. Both documents allowed the identification of the project effects. The 2005 plan also turned the project focus from merely infrastructure planning (connectivity improvement) to spatial planning (landscape protection and regional development). Based on this plan, the implementing agency successfully minimized 40% of the total area that could be converted according to MoU 2004. In 2009, a group of university experts were hired as landscape consultants to perform a thorough field investigation. They then published a highway landscape design in complement with the 2005 plan with the title '*Engineering and Landscape in Harmony*' (LBLL 2009). According to the group leader, the design '*harmonized the massive structure of the new highway with its surrounding landscape by exploiting the touristic potentials*' (Interview B4).

From the *politics stream*, a change in project management, from the provincial government to the Ministry of Public Works, opened the sustainability window. This shift allowed the infusion of additional funding to implement the combined solutions, do fact-finding, and perform joint-research. In collaboration with Ministry of Forestry, the Ministry of Public Works monitored the project effects and restored the displaced landscape and habitats (BKSDA & DPJ 2009). The involvement of the university experts also helped identification of touristic spots along the highway that became as assets of the local people. By coupling the three streams, the project manager seized an opportunity for balancing interests and allowed the implementation to start.

### **Reflecting on a tale of two highways: coping with strategic ambiguity in planning sustainable road development**

#### ***Coping with strategic ambiguity by seizing 'sustainability' windows***

Concerning strategic ambiguity, the Bali Mandara Highway case shows that the initial project mission of improving economic growth (regional connectivity and

tourist attraction) conflicts with the interest of protecting the environment (mangrove forests and religious site preservation). In the Kelok-9 case, the project mission (improving regional connectivity) disputes with an interest of preserving the protected forest. Both cases illustrate that development project missions/goals often contain strategic ambiguity (Giezen et al. 2015) that can be resolved through reflection on the problems and the solutions (Salet et al. 2013). Such a process includes recognition of problems at a larger scale (international and national) and a lower spatial scale (local). In the Bali Mandara Highway case, the problems are located at the national and regional level (regional connectivity) as well as at the local level (landscape protection). In the case of Kelok-9, the provincial government initially launched the mission of solving the bottleneck problem (at a regional scale), then recognized that the displaced species habitats (at a local scale) also required attention.

The opened sustainability windows illustrate moments when the stakeholders integrate competing interests by coupling the problems, solutions, and political streams. The case of Bali Mandara Highway shows that the problems were discussed in open discussion with the local stakeholders that allowed the solutions to emerge (conformance to high environmental standards and minimization of land acquisition) (Interview A1). In Kelok-9 Highway, the solutions consisted of mitigation measures that '*combined a technical solution (construction of high-pillar bridges to reduce land-use change and tree logging), and landscaping (slope prevention and tourist spots for sightseeing)*' (Interview B1). It appears that the appearance of the windows also provided ways for the project leader/manager to innovate and create added value in coping with strategic ambiguity in large-scale infrastructure projects (Giezen et al. 2015).

The political stream comes from pressure groups (powerful stakeholders) and the change in administration and project management that gave supports for the windows to present themselves. Darmoyono (2019) explained that socio-cultural norm or *gotong royong* (collective works), encouraged continuous efforts of the stakeholders in the Indonesia road development to resolve their conflicts in an informal way. In the Bali Mandara Highway case, the inclusion of religious leaders into the project planning has proven effective as these stakeholders are well-respected in communities (Lamade et al. 2014). The seeking of the windows in both project cases here can be understood because of lack of formal actors' leadership and commitment, and time and fund limitation, which are commonly found in developing countries (Pojani and Stead 2015). Top-down commitments from politicians or bureaucrats may also be inadequate to implement the recommendations (Fischer 2004). At a given point in time, the stakeholders successfully matched their interests by using the windows available to them.

### **Mobilization of policy networks and the coupling of streams by the project manager**

Both cases illustrate that policy networks can have a vital role to open the sustainability windows. These networks allow appreciation of each other's interests and collaboration in the seeking of appropriate solutions (Reardon 2018). In the Bali Mandara Highway case, the interaction of the project consortium and the religious leaders reduced social tensions with the communities with interests of protecting their cultural sites. The Kelok-9 example shows that the network tie between the public works and the forest authority encouraged resource sharing and collaboration for viable solutions. The project manager (the Ministry of Public Works) and the Nature Conservation Board collaboratively mitigated the displaced landscape through joint-monitoring and research. With the university experts, the project manager tailored solutions (highway re-alignment, landscape protection, and people empowerment).

The project managers working with the religious leader (Bali Mandara Highway) and the expert team (Kelok-9) have a vital role in coupling the streams. These actors show the qualities of being 'policy entrepreneurs'. First, they invested time to gain political support from other powerful parties and to remove any possible delays in implementing the solutions. In the Bali Mandara Highway case, the project manager earned immaterial paybacks from gaining a good reputation from 'delivering the project on time prior to the international APEC 2014 meeting held' (Interview A1). The religious leaders were concerned about the sacral status of the project site and the improvement of people's livelihood from better connectivity (Lamade et al. 2014). Second, these actors also wanted to generate and test their solutions as prototypes for future projects with a similar challenge. In the case of Kelok-9, the project manager with the university experts linked up the problems and solutions into a detailed implementation plan that provided a showcase for future projects in nature conservation areas. These results, therefore, substantiate that policy entrepreneurs are 'more than just advocates of particular solutions; they are power brokers, coalition enablers, [and] manipulators of problematic preferences and unclear technology' (Zahariadis 2016: 35). These actors involved in several decision arenas that enabled them to connect problems and solutions (see also Van Stigt et al. 2013).

### **The effectiveness of the sustainability 'windows' and the use of EIA**

In both cases, the 'windows' help to integrate interests with several reasons. First, the opening of the windows allows the stakeholders to deal with multiple options to complete the project mission. The Bali Mandara Highway case shows that the initial mission only (economic

development) could not be fulfilled unless the local concerns with the social and landscape displacement were resolved. The mission is therefore expanded from connectivity improvement to community livelihood, mangrove protection, and cultural preservation (intra-generational equity and inter-generational equity). Second, the windows provide the implementing agencies with solutions that are financially viable and socially acceptable. In the Kelok-9 case, the final proposal includes a solution that minimizes land occupation for new bridges and roads. The solution expands opportunities for the local communities to manage sightseeing spots for tourists, obtaining long-term economic benefits (intra-generational equity).

The windows also allow the stakeholders to interact and establish collaboration through mobilizing their networks. The windows help these stakeholders to overcome limited capacities for integrated decision-making. In the Bali Mandara Highway case, the project manager approached the respectful local leaders who were concerned about social displacement to avoid social conflicts. The networks allow resource sharing, such as funding and skilled personnel. In the Kelok-9 case, the Ministry of Public Works funded joint-research and monitoring with the forestry authority to minimize adverse project effects.

The environmental assessments carried out in both cases are parts of the policies/solutions stream. By reviewing the EIA recommendations, the stakeholders identified the adverse effects and continuously refined the solutions for mitigation. Open discussions of the proposed recommendations helped the stakeholders involved to reflect on the project mission and to prepare for implementation with legitimate proposals/plans. The EIAs thus facilitate learning between the stakeholders, refinement of the problems and the solutions, and reflection of the project missions. In seizing the sustainability windows for integration, stakeholders expand their organizational capacities and mobilize networks to solve problems collaboratively (Salet et al. 2013; Scandeliuss and Cohen 2016).

### **Conclusion**

This paper demonstrated that the Multiple-Streams Framework (MSF) could be useful to structure decision-making processes in road infrastructure planning. The initial mission of the development projects often contains the element of strategic ambiguity that is characterized by multiple interpretations of the project goals, missions, or purposes. The concept of strategic ambiguity here is crucial in recognizing that there are many creative ways in which stakeholders can frame and reframe the project goals (Glasbergen and Driessen 2005; De Bruijn and Leijten 2007). The analysis of the multiple streams – problem, policy, and political streams – helps to account for strategic ambiguity by

considering the complex decision-making processes that often complicate the planning processes. Strategic ambiguity is seen here as necessary to reassess viable solutions and seek added value (Priemus 2007; Giezen 2013; Giezen et al. 2015). This paper also substantiates that strategic ambiguity allows for reflection on what sustainability means to the stakeholders (Kemp and Martens 2007) and mobilizes collaboration for implementation (Scandellius and Cohen 2016).

This paper was inspired by the work of Kingdon (1984) and later advancement by other scholars (e.g. Hermansen 2015; Zahariadis 2016; Howlett 2018; Reardon 2018). MSF is applicable to investigate the streams leading to the presence of a 'sustainability window', in which strategic ambiguity of the projects are coped with, diverse interests are made balanced, and solutions become acceptable to all stakeholders. Explicitly considering the dynamics of the decision-making in two highway projects in Indonesia, the integration of the interests consists of recognition of the problems and the solutions and associated with them within and across arenas, in which EIAs are informally discussed. EIA here becomes a vital element of the solution/policy stream that facilitates learning and joint fact-finding between stakeholders. Planners and decisions-makers therefore can link up the recommendation with the problems and expand the networks to support the implementation.

Pojani and Stead (2015) argue that most developing countries have a lack of resource and political capacities for implementing sustainable transport infrastructure development. Recently, road projects have become a primary national strategy to improve economic growth in such countries (Diaz-Sarachaga et al. 2017). However, environment assessments, such as EIA and SEA, might be less compelling to assist the integration because the institutional context is often less supportive than mostly assumed (Nykvist and Nilsson 2009). This paper substantiates that recommendations produced appear less effective in politicized situations (Fischer 2004). As found in the empirical case, the lower jurisdiction showed limited funding to fulfill all recommendations (Kelok-9) and the external stakeholders could drive the commitment for implementation (Bali Mandara Highway). Rather than relying on detailed information on the effects, planners and decision-makers should be more aware of the various streams in which the interests at stake can be integrated into project proposals or plans.

In Indonesia, road infrastructure development is highly fragmented, involving various sectors operated in various jurisdictions. The sectoral fragmentation impedes the scoping and screening of the project impacts across the sectors and administrative levels (Giovanna et al. 2006; Darmoyono 2019). Without formalizing the incorporation of the environmental assessments into the local planning process, the

integration of sustainability aspects seems challenging to reach. Moreover, long-term objectives and targets are usually not portrayed as being at the heart of decision-making (Delphine et al. 2019b). Similar situations are found in the case of flood management in Indonesia, in which the national policymakers need not only well-defined articulations of problems, but also public pressure to implement the proposed solutions (Simanjuntak et al. 2012). The integration of interests needs a 'window' that presents itself through participation of wider stakeholders, political supports, and the role of policy entrepreneurs.

For future research, more cases are needed to substantiate how MSF can be effective in structuring complex decision-making processes and in coping with strategic ambiguity of project goals. Our study was located in a context of developing worlds in which road infrastructure projects have become a leading strategic for achieving economic competitiveness but political commitment can easily change in integrating environmental considerations (Regmi 2014), and less powerful stakeholders are often omitted from the discussion of development effects (Othman 2013). Strategic ambiguity, therefore, may deepen conflicts between stakeholders, and they may constantly struggle to incorporate their interests in the project planning. More investigation on unbalanced power relations can inform how the integration of interests associated with sustainability needs not only 'best technical solutions', but also continuous reflections of the project goals and better stakeholders' engagement.

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