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To cite this article: Delphine, Patrick Witte & Tejo Spit (2020): Bridging the perception gap? When top-down built megaprojects meet bottom-up perceptions: a case study of Suramadu bridge, Indonesia, *Asian Geographer*, DOI: [10.1080/10225706.2020.1750441](https://doi.org/10.1080/10225706.2020.1750441)

To link to this article: <https://doi.org/10.1080/10225706.2020.1750441>



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Published online: 23 Apr 2020.



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Bridging the perception gap? When top-down built megaprojects meet bottom-up perceptions: a case study of Suramadu bridge, Indonesia

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ABSTRACT

For the last few decades, the development of mega-infrastructure projects has been high on the agendas of policymakers in Southeast Asia. Despite the potential benefits of such projects, there are also inevitable societal impacts that often lead to protests by local people. In general, most literature on megaprojects focuses solely on managing projects, with limited coverage of local people's perceptions. This article, however, offers an analytical approach to perception making, adopted from psychology theories, which is then elaborated upon in a quantitative and qualitative empirical setting using the Suramadu cable-stayed bridge in Indonesia as a case study. Our main argument is that perceptions about megaprojects can change as a result of long-term, high-level exposure to such projects. The results imply the need for megaproject development to take people's perceptions into account to bridge the gap between top-down expected benefits and bottom-up acceptance or rejection by those outside the central power.

ARTICLE HISTORY



Received 3 June 2019
Accepted 29 March 2020

KEYWORDS

Megaproject; perception; people; infrastructure development; Indonesia

1. Introduction

Megaprojects are usually defined as large-scale infrastructure projects involving substantial investments, a long period of development, numerous stakeholders, and the ability to transform spaces irreversibly (Flyvbjerg 2014). Examples range from airports and high-speed railways to urban development projects. Increasingly often, megaprojects are built as part of an urban entrepreneurial strategy with the goal of increasing economic growth and city competitiveness by restructuring the socioeconomic and the spatial structure (Flyvbjerg, Bruzelius, and Rothengatter 2003; Qian 2011). Under the pressure of globalization, cities have experienced new forms of urbanism, especially in the case of Southeast Asia (Yeung 2002), leading policymakers to develop megaprojects as part of their global branding strategy (Swyngedouw, Moulaert, and Rodriguez 2002).

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However, despite their popularity on development agendas worldwide, megaprojects are complex and regularly prove to be over-optimistic concerning the delivery of benefits (Flyvbjerg, Garbuio, and Lovallo 2009). Many megaprojects have failed to deliver the promised benefits to the local people (Brookes and Locatelli 2015), and the promises associated with megaprojects often do not live up to people's *a priori* perceptions and everyday realities. In the case of Southeast Asian cities, many urban megaprojects are formulated by powerful actors who define public interest and create urban space that later leads to issues of inequity and exclusion (Shatkin 2008).

As megaprojects clearly affect local residents, it is important to look at how people perceive the development of such projects. The need to do so has become more urgent due to three emerging issues. First, people are considered one of the drivers of successful megaproject development (Mišić and Radujković 2015). Local people are expected to be able to make use of the project and enjoy its benefits. In this case, the issue is related to the actual delivery of project benefits. Second, it is the local people who will feel any negative externalities of a project. Although assessment tools are used in decision-making processes (e.g. Vanclay 2016), it is hard to establish the actual impacts of a project at an early stage of development (Winch 2001). In addition, opportunistic behavior by the primary actors can lead to the marginalization of impacted communities (Magee and McDonald 2006). Third, if the authorities fail to accommodate these perspectives when developing megaprojects, they will have a legitimacy issue. Flores Dewey and Davis (2013) argue that acknowledging different opinions concerning what is considered a "good" megaproject when planning and implementing a megaproject can at least support the legitimacy of the project.

Numerous scientific studies have focused specifically on megaproject management (e.g. Flyvbjerg, Bruzelius, and Rothengatter 2003; Van Marrewijk 2007; Zhai, Xin, and Cheng 2009; Giezen 2012). The review carried out by Di Maddaloni and Davis (2017) shows that the literature contains limited points of view regarding the incorporation of secondary stakeholders, mainly the affected groups of people. The scarce literature on the perceptions of local people about megaprojects mainly focuses on flagship urban redevelopment projects, (e.g. Doucet, Van Kempen, and Van Weesep 2011; Anzoise, Slanzi, and Poli 2020) – most of which are designed to be symbolic, unique, and iconic – rather than on functional megaprojects, which merely serve as infrastructure to support urban activities. Both Doucet, Van Kempen, and Van Weesep (2011) and Anzoise, Slanzi, and Poli (2020) highlight the importance of large infrastructure projects having mixed goals, such as improving the quality of life of diverse groups of people and providing them with benefits. They also believe that flagship megaprojects have the ability to create a glamorous fantasy about modernity; however, the sense of isolation, displacement from, and connection to the area is evident among local populations, which might lead to mistrust. What is interesting is that the trend is uncertain, as found by Doucet, Van Kempen, and Van Weesep (2011), and that spatial proximity does not always have a significant effect on people's perception of potential tangible benefits.

In addition to adding diversity to the types of projects in the megaproject literature, and covering the topic of people's perceptions of megaproject development by examining a functional transportation megaproject, we want to challenge Doucet, Van Kempen, and Van Weesep's (2011) findings in terms of spatial proximity, namely whether spatial proximity has a significant influence on people's perceptions. We also want to include people's

long-term exposure to megaprojects, as highlighted by Rooney, Robinson, and Petrone (2015), by investigating whether people's perceptions change over the development stages. To do so, we devised two research questions:

- (1) How does spatial proximity influence the way groups of people perceive built functional megaprojects?
- (2) How do their perceptions change over time?

The central argument of this paper is that people's perceptions of megaprojects might change over time and space. The underlying argument is that, in general, megaprojects create long-term, high-level exposure of negative externalities to the daily living environments of people (Rooney, Robinson, and Petrone 2015), which can create a feeling of disturbance or pleasure in people. We analyze this from the spatial and temporal scale. The spatial scale – i.e. spatial proximity of the megaproject to people – is in this case understood as new space creation in the adjacent area (Gellert and Lynch 2003) and the range of impacts according to spatial proximity (Banister and Berechman 2001). The temporal scale – i.e. people's exposure to megaproject development over time – is characterized by the long period of time associated with the development stages, during which people's perceptions of a megaproject might change as a result of their expectations and the actual impacts.

The aim of this paper is (1) to provide a starting point to incorporate secondary stakeholders in the development of megaprojects – mainly those who are far from central power (residents and affected groups of people, for instance, fishermen, low-skilled laborers, or resettled groups of people) – (2) to depict how the implementation of megaprojects might affect people's daily lives, and (3) to explore how megaproject development can do less harm to society, especially in developing countries.

The experience of developing countries with megaproject development is unique due to the challenge of managing social complexity regarding the community's acceptance (Othman and Ahmed 2013). Especially in the case of Southeast Asian cities, urban development has led to conflicts between citizens and developers regarding economic, environmental, social, and cultural implications (Shatkin 2008). In some cases, the equity issues are related to the benefits reaped by the rich at the expense of the poor (Shatkin 2008.).

We used the Suramadu cable-stayed bridge in Indonesia as a case study for two reasons. First, the project is at the usage stage, which makes it possible to investigate people's perceptions during its entire development process, that is, the planning, construction, and usage stages. Second, the case study represents a turning point in Indonesian development practices in the way that megaprojects are dealt with. In response to rapid globalization in Southeast Asia, this project was a way to balance the development of the country's second largest city – Surabaya – with that of one of its poorest regions, Madura Island.

We base this perception-making processes on Werner and Wapner's (1952) article "Toward a general theory of perception" and combine it with megaproject literature to capture perception making during certain megaprojects. This is explored in the following section.

2. People's perceptions of megaproject development

A primary stakeholder in a project is defined as a group of individuals who have an important role in keeping the cooperation over the project going and are usually bounded by a

contractual relationship with the project (Clarkson 1995; Aaltonen and Kujala 2010). A secondary stakeholder is typically an actor who influences and is influenced by the cooperation, but is not directly involved in it (Clarkson 1995). It is common that in megaproject development practices, the primary stakeholders' perceptions can lead to value creation in actual implementation (Van Marrewijk 2007). Megaproject development is well-known as a top-down strategy directed by top-tier national or international actors, in which each stakeholder has different interests and expectations (Flyvbjerg, Bruzelius, and Rothengatter 2003).

However, the perceptions of the primary stakeholders are not always in line with those of the secondary stakeholders. Usually, the main difference is that project promoters perceive the megaproject as an economic investment, while local people suffer the externalities (e.g. noise, smoke, pollution, displacement) and do not necessarily benefit from the project (Qian 2011). This is closely related to the exclusion of affected or targeted local residents from the decision-making processes (Qian 2011). Clashes between the two parties are inevitable, as they hold divergent views about the costs and benefits of the project (Herrold-Menzies 2006); for example, there have been local protests about the HS2 high-speed rail network in the United Kingdom (Rozema et al. 2015) and community resistance to the N2 Gateway housing project in Cape Town (Jordhus-Lier 2015). In both cases, the local community contested the project's economic benefits for the local people and their lack of participation. The promoters of both projects failed to convince the communities that the rationale for the development included the promotion of public interest.

Although most of such resistance takes place at the community or group level, we argue that the core issue is at the individual level. People as individuals make an intuitive judgement and have a preference for their immediate environment. They create a certain perception of their environment, which includes any new megaprojects in their area. The perception starts at the individual level and accumulates into the collective perception of a group of people with the same point of view. We therefore argue that before understanding the communal concerns, it is important to get a sense of individual perception making in megaproject development. To unbox the concept of people's perceptions of megaproject development, we use Werner and Wapner's abovementioned article and elaborate on this theory by linking it with the megaproject literature. The article is useful because it outlines the development stages of perception making in a concise, simple, and manageable way without omitting higher levels of complexity (Werner and Wapner 1952). Their work has significant influence in most common theories of perception in the psychology field.

Werner and Wapner (1952) highlight the stages of perception making with basic experimental situations in which they insist that perceptual behavior is influenced by certain stimuli. Stimulation is considered an influence on the balancing state regardless of the presence or absence of objects (Rock and Palmer 1990). Werner and Wapner (1952) believe that both object and perceiver are important, thus making the past history, experience, and adaptation level important. By acknowledging this, it is necessary to have a starting point for unboxing the human dimension of urban form and function (e.g. Rapoport 2016).

The concept of perception making being influenced by certain stimuli (Werner and Wapner 1952) is highly relevant to explain people's perceptions of megaproject development in order to achieve the inclusion of all project partners and stakeholders, and ensure that they share a common understanding, in governing megaprojects (Van Marrewijk and

Smits 2016). It specifically relates to the practice of post-political governance technologies and rationalities that replace conflicts with consensus and negotiation (Allmendinger and Haughton 2012; Balke, Reuber, and Wood 2018). Acknowledging the importance of stimuli in individual perception making as a function of counteraction toward the impacts and benefits of megaprojects, we made a distinction between stimuli from megaprojects' externalities (as internal stimuli) and context-specific stimuli (as extraneous stimuli) by incorporating some core concepts of megaproject studies.

2.1. Megaproject externalities (internal stimuli)

We define internal stimuli as direct and indirect externalities caused by megaproject development, because we argue that, in general, both externalities contribute the most to perception making. When defined as an opportunity, the benefits of a megaproject can be both directly and indirectly beneficial to the targeted society (Eweje, Turner, and Müller 2012). In the case of transportation megaprojects, the direct benefits usually go to the users as a location-specific investment (Banister and Berechman 2001); for instance, increasing comfort and reliability, and reducing travel time, accident probability, and congestion (de Rus 2008). Later, the broader indirect benefits appear as spill-over effects from the direct benefits, such as increased income and more employment opportunities (Dimitriou, Mourmouris, and Sartzetaki 2015). Furthermore, when defined as a threat, the externalities of megaprojects can be seen as a result of proponents' ambitions, whereby they oversell the benefits and underestimate the negative impacts of their projects to gain either support or project approval (Flyvbjerg, Bruzelius, and Rothengatter 2003).

We argue that, both as an opportunity and a threat, the externalities working on different spatial and temporal scales become stimuli for perception making. Some types of megaprojects create large-scale, long-term impacts (Rooney, Robinson, and Petrone 2015). The spatial scale is important due to the ability of megaprojects to transform place (Gellert and Lynch 2003) and because of the indirect impacts of megaprojects on the adjacent area (Banister and Berechman 2001), while the temporal scale is important because the benefits of megaprojects tend to work over longer time horizons, which is why policymakers in developing countries prefer incremental solutions with shorter time horizons (Ansar et al. 2014). The added value of incorporating both scales provides a better understanding of people's exposure to the megaproject (Rooney, Robinson, and Petrone 2015), which leads to either negative or positive perceptions of the project. It is also believed that these scales have a framing power that can shape the attitude of society towards the project (McCann 2003).

2.1.1. Spatial scale

We are particularly interested in the new space created by megaproject development, as explained by Gellert and Lynch (2003). Megaprojects have the ability to transform spaces and have tangible impacts on the adjacent area.

At first, the arrival of a major construction project in a remote area might raise expectations among the local people. The project will require many laborers, which will benefit the local economy significantly. In addition, the prestigious construction tends to compensate for the hardship of the residents, which often leads people to hold positive views of a project (Doucet, Van Kempen, and Van Weesep 2011).

However, most of the time, local residents living near a project tend to suffer from negative economic, social, and ecological consequences that transform the spaces into something disruptive, threatening, and disorienting, and disturb their daily lives (Jamali 2014). Moreover, the benefits of particular megaprojects are sometimes gained by displacing low-income, rural, or native people, leading to their impoverishment (Windsor and McVey 2005; George and Rajan 2015). As a result, people can lose their jobs, or even their livelihoods, especially when there is no proper mitigation plan in place (Gellert and Lynch 2003). Displacement might also create social division, disempowerment, and a reconfiguration of power relations (Jordhus-Lier 2015). In many cases, such impacts as environmental noise are disregarded, even though excessive exposure can be a nuisance and lead to sleep deprivation, other health issues, and cognitive development impairment (King et al. 2016). Thus, people tend to have more negative attitudes toward the projects.

Meanwhile, people in adjacent areas tend to experience direct negative externalities: The benefits of megaprojects are largely an indirect effect the further away the project is. Particularly in the case of a transportation megaproject, there is a coupling relationship between economic growth and the improvement of transportation (Saidi and Hammami 2017). The economic impact is considered a multiplier, derived from Keynes's theory in which increments in demand ripple their way through an economy, triggering additional demands (Kockelman et al. 2005).

2.1.2. Temporal scale

Since megaproject development takes a long time, people's perceptions may change, for better or worse, during the planning, construction, and usage stages. People's perceptions are based on the evolving stages of megaproject development, which often entails a dynamic process (Ma et al. 2017). The problem is that the actual benefits of megaprojects materialize only after the construction has been completed, and the early planning stages tend to involve unreliable information, creating uncertainty about future events. Therefore, during the planning and usage stages, people might have unrealistic perceptions of megaprojects.

Here, impact assessments play a significant role in predicting the actual impacts so that sufficient mitigation strategies can be generated as early as possible. For local residents, complete and accurate information about the result of impact assessment is crucial if they are to adapt to the impacts over time. Such an assessment enables an understanding of determinant effects on cost and benefits, and may affect the success of the project (Van Wee 2007). However, practice shows that cost-benefit analyses of megaprojects tend to be unreliable and biased, due to negative incentives that lead to underestimated costs and overestimated benefits in order to be appealing (e.g. Flyvbjerg 2009). Most social and environmental indicators are often not incorporated into project appraisal and decision-making processes, so the relevancy of these indicators is poorly assessed (Labuschagne and Brent 2005), which adds to the uncertainty in the initial phase. Here, the temporal scale is relevant, because the high level of uncertainty during the inception phase decreases during the completion stage (Winch et al. in Winch 2001). This could cause people's perceptions to eventually change.

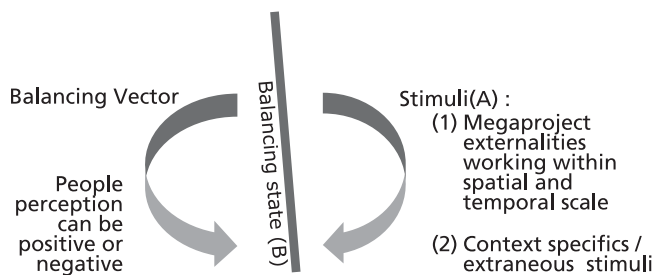
2.2. Context-specific features (Extraneous stimuli)

Besides the stimuli from the megaproject itself, we also define extraneous stimuli for people's perceptions as context-specific features of megaprojects. We acknowledge how context-specific attributes of human–environment interactions contribute to perception making (Ostrom, Janssen, and Anderies 2007). These interactions make a project's location unique and generate tacit knowledge among local residents about their living spaces. This tacit knowledge is inherently different from explicit knowledge (Te Brömmelstroet and Bertolini 2008): It is multi-dimensional and we should be aware of the various contexts within which this tacit knowledge is enacted and formed (Fernie et al. 2003).

These context-specific features of megaprojects consist of project culture (Van Marrewijk 2007), social context (Jia et al. 2011), history (Engwall 2003), planning culture (Sanyal 2005), citizen participation (Arnstein 1969), and socioeconomic and development context (Othman and Ahmed 2013). The deliberations on the context of the surroundings also indicate the importance of interdependencies between projects, personal ties, local relations, and organizational affiliations (Grabher 2002). Similar types of projects can share different contexts and situations as well as approaches to different situations and challenges (Khan 2005). No project is an isolated island (Engwall 2003). The context dependency of projects might shape people's perceptions of megaproject development. However, many planning practices are led by architects who do not have in-depth knowledge of the local planning culture; thus, planning is alien to local culture and is not responsive to the people's needs (Sanyal 2005). Therefore, participation is seen as empowering citizens to raise their concerns about the localities that have been excluded from the planning processes (Arnstein 1969).

2.3. Analytical approach

To sum up, we offer an analytical approach to explain the process of perception making in relation to megaproject development. Two types of stimuli influence how people perceive megaproject development, namely the stimuli from the project itself – which is characterized by externalities working within different spatial and temporal scales (I in Figure 1) – and the context-specific features of the megaproject (II in Figure 1). It is then the balancing



adapted from Werner and Wapner (1952)

Figure 1. Analytical Approach: Figural adaptation of perception making about megaprojects. Source: Adapted from Werner and Wapner (1952).

state (A in Figure 1) of people that reacts to both types of stimuli and perceives the development in a certain way. It is the circumstances in which all competing stimuli are balanced. The perception can be either positive or negative (B in Figure 1).

To operationalize this framework, we identify the negative stimuli on the spatial scale as new space creation, forced displacement, loss of livelihood, and environmental impacts. On the temporal scale, the long duration of development stages can contribute to the changing perception and the context of the area. This links closely to the level of uncertainty, which is decreasing as the development progresses, and the context of the development. Besides the stimuli from megaprojects, there are also extraneous stimuli influencing perception – such as the context of the area and the context of the development – which will generate tacit knowledge to process the stimuli from megaprojects. This process is illustrated in Figure 1.

We use this analytical approach and its operationalization to evaluate the empirical findings from the case study.

3. Study area and research design

3.1. Study area: Suramadu bridge

The Suramadu Bridge is a 5.4 km long cable-stayed bridge over the Madura Strait connecting Surabaya on the island of Java with Madura Island (“Suramadu” is made up of the “Sura” from Surabaya and the “Madu” from Madura). Since the bridge has now been in use for eight years, it encapsulates some lessons learned in capturing changing perceptions throughout the development stages of a functional transportation project.

The aim of the project was to accelerate urban development in the Suramadu area. Surabaya is the capital of East Java Province and is located in the northeast of the province. It is the country’s second largest city and has experienced an annual economic growth of more than 7% for the last decade (BPWS 2015). Madura, on the other hand, is not yet properly developed, and the area lags behind other areas in East Java Province in terms of economic development. Madura covers approximately 5000 square kilometers and is inhabited by at least 3.6 million people.

Although the bridge was developed to create better access to the island and thus generate economic value, it also became an iconic symbol of Surabaya and Madura. Looking back at the history of its construction, the bridge became the icon for the relationship between Indonesia and China, as the project was executed by a consortium of Chinese and Indonesian contractors (BPWS 2015). The bridge itself, which was initially mooted in the 1960s, has been completed, but large-scale urban development/redevelopment projects are ongoing in the adjacent areas.

3.2. Research design

The research method applied in this study was both qualitative and quantitative. Combining the two approaches provides a deeper understanding of a research problem (Creswell 2013). For the data collection, Bahasa Indonesia (Indonesia’s official language) was used to help the respondents understand the questions. We used semi-structured interviews to put together an in-depth story of how different groups of people perceive the megaproject and

what kind of stimuli influence their perception and understanding of the local context. Furthermore, with a view to providing quantitative support for this in-depth story, door-to-door surveys were conducted in areas around the bridge to complement the interviews.

To capture the spatial scale – i.e. spatial proximity of people to the megaproject, we used purposive sampling. The method is useful to incorporate respondents with particular characteristics who are capable of describing their area and are aware of the phenomenon (Etikan, Musa, and Alkassim 2016). We then chose two areas for field research to represent the community living close to the bridge (i.e. at both ends of the bridge) and one area further from the bridge to capture the indirect impacts of the development (further information about the areas is provided in Table 1). The areas close to the bridge are Bangkalan Regency and Surabaya City, which had been designated by Presidential Decree as a development area (known as Kawasan Kaki Jembatan Suramadu; KKJS). In Bangkalan, the neighborhoods chosen are in the Labang district, namely the villages of Pangpong and Sukulilo; in Surabaya, the neighborhoods are in the Kenjeran district, namely in Tambak wedi subdistrict. These neighborhoods are close to the bridge and are assumed to have experienced the direct impacts of the development, especially in terms of negative externalities, such as displacement, resettlement, and environmental impacts. To capture the indirect effects, we chose Kota Sumenep district and Lombang village, Batang Batang district in Sumenep, because they are the parts of Madura Island that are the furthest away from the bridge. We chose these areas because the bridge was designed to boost the economic development of Madura Island. Therefore, as Kockelman et al. (2005) argue that the economic impacts are the rippling effects from other related effects, we wanted to see whether the locations further away felt the actual benefits of the project and were positive about it (Figure 2).

The fieldwork was conducted in January 2017. We used both interview protocols and open questions, the latter as a follow-up response to respondent's answers. Besides interviewing residents, we also interviewed fishermen, street vendors, community figures,¹ and community leaders. For these latter interviews, respondents were selected based on snowball sampling techniques, and we tried to keep the selection bias as low as possible. We also interviewed heads of the subdistricts, academics from the local university, and the head of the Planning Department from Badan Pengembangan Wilayah Surabaya–Madura (BPWS) – the Surabaya Madura Development Agency (Table 2).

A survey was used as a mixed method strategy to compare the outcomes of the interviews (i.e. the anecdotal stories of the interviewees) with the general picture that emerges from the larger number of respondents in the survey ($n = 603$). The questionnaire items included socio-demographic variables, general perceptions of the

Table 1. Overall information of the field area.

	Labang	Kenjeran	Kota Sumenep	Batang-Batang
Inhabitants (people)	34,579	161,357	77,457	55,019
Ratio female/male	0.81	0.98	1.05	1.073
Households	16,760	40,908	24,528	17,990
Main Employment	Farmer, trader, fishermen	Industrial workers, fisherman	Farmer	Farmer, fishermen

Sources: Bangkalan in figure 2018 <https://bangkalan.kab.bps.go.id/>; Surabaya in figure 2017 <https://surabayakota.bps.go.id/>; Sumenep in figure 2017 <https://sumenekab.bps.go.id/>



Figure 2. Overview Map of the case study.

Table 2. Number of participants.

The Respondents	Number of interviews $n = 44$
Head of Planning Deputy from BPWS	1
Head of sub-districts/villages	4
Residents	26
Fishermen	3
Street vendors (Pedagang kaki lima)	4
Community figures	3
Academia from local university	3

project, experiences with accessing information about the impacts, experiences with environmental and social impacts, and changing perceptions over time (see the [Appendix](#) for the specific questions).

In terms of the survey's sampling, for the areas near the bridge, we chose the first 100 households on the street leading away from the bridge along the shoreline in each neighborhood, at both ends of the bridge (i.e. a total of 400 households). For the area furthest from the bridge (Sumenep), the first 100 households close to Kota Sumenep's city center and the first 100 households close to the main tourist attraction of Lombang beach were selected. These locations were chosen because it was expected that these "hotspots" would be most likely to feel the indirect benefits of the bridge's development.

The surveyors went door to door in the targeted neighborhoods and surveys were conducted based on the willingness of the households to participate. If the residents did not agree to participate, the surveyors moved on to the next house until they had collected 100 samples in each selected neighborhood. A total of 603 completed surveys were collected with a 100% response rate ([Table 3](#)).

Table 3. Demographic characteristics of the respondents.

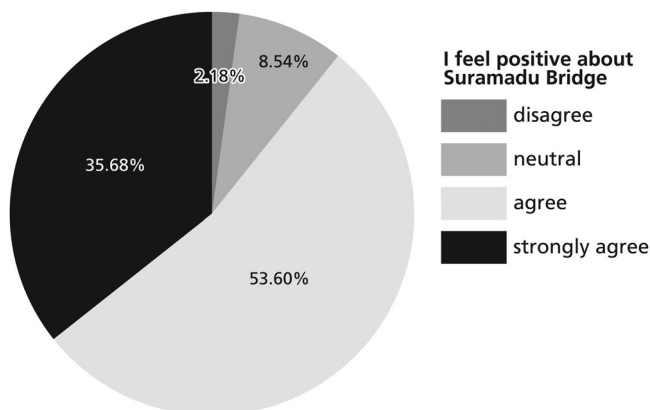
Characteristics	Frequency	Percentage
<i>Gender</i>		
Male	305	50.6
Female	298	49.4
<i>Location</i>		
Surabaya	202	33.5
Bangkalan	200	33.2
Sumenep	201	33.3
<i>Education</i>		
No education	49	8.1
Elementary School	185	30.6
Junior high school	151	25
Senior high school	180	29.8
University	38	6.3
<i>Monthly income</i>		
Less than regional standard salary	436	72.3
Regional standard salary up to 10.000.000 Rupiahs	167	27.5

Those who preferred to complete the survey themselves were given a self-administered questionnaire. Otherwise, the fieldwork assistants read the questions to the respondents and recorded their answers on the questionnaire. Respondents were asked to rate how much they agreed with the various statements, ranging from 1 (= strongly disagree) to 5 (= strongly agree). After completing the questionnaire, the participants were asked whether they were willing to be interviewed. The survey participants were people present in the house, older than 17 years, and part of the household.

To analyze the case study, we elaborate on the approach described in the previous subsection, then use a descriptive approach to depict the findings.

4. People's perceptions of Suramadu

The overall picture shows that the vast majority of the respondents feel positive about the development of the bridge (Figure 3). Based on this overall picture we will explore the stimuli influencing this attitude and whether the respondents' perceptions had changed over time.

**Figure 3.** Respondents' general perceptions about Suramadu.

4.1. Externalities from Suramadu bridge

The plausible reason for the respondents' positive feelings is that the bridge provides a wide range of direct and indirect benefits. In terms of direct benefits, the bridge has effectively connected Madura Island with the island of Java, reducing the travel time between Bangkalan and Surabaya from two hours to 15 min. People used to have to go by ferry, which was highly dependent on the weather and entailed a lengthy wait. Answers to the open questions in the questionnaire revealed that some respondents emphasized the decrease in travel time, while others found that using the bridge was a more convenient way of traveling. The bridge also benefits the flow of goods, which in a broader sense can also affect the economy. As one of the respondents in Sumenep said:

[Suramadu bridge] makes life convenient, especially for truck drivers and fish traders. They do not need to wait for a long time to cross the strait. Traders no longer lose income due to rotten fish. The fish can be delivered further, fresh, and on time.

In terms of indirect impacts, the bridge has generated broader economic impacts and attracted investors to Madura. As explained by the head of a subdistrict in Bangkalan:

Before the bridge was built, this area was so quiet. Now, sooner rather than later, the new industrial area and tourism spot in this area will start to attract investments. The development has already started and land prices are also increasing significantly.

To balance the view and to investigate the stimuli influencing this attitude, we conducted an in-depth interview with the development agency. It is clear that the agency's mitigation plan plays an important role in narrowing the gap between the externalities felt by the affected groups of people and the expectations of the central government as regards benefits for the targeted societies. The contrasting views between those who are negatively affected and those who have benefited differ within the spatial and temporal scales, as do their benefits and costs, as explained below.

4.1.1. Spatial scale

The new creation of space is most visible in the massive (1800 ha) redevelopment plan for the surrounding area. The head of the Planning Department explained that there are three areas in Bangkalan available for private investment and two areas for public-private partnerships, as documented in the Grand Design of Bangkalan Development Plan. In this plan it is expected that the bridge will, in the future, have even bigger economic impacts on Madura Island (BPWS 2017).

Triggered by this acceleration plan, at least nine big private investors are interested in the development of the surrounding area. Five out of the nine are foreign investors from China, Korea, Malaysia, and the United States of America.

A broader development approach is also planned by the development agency to maximize the indirect economic benefits for the whole island. There are fifteen areas on Madura Island in which economic acceleration will take place in the future. The head of the Planning Department explained that the development agency has already planned six development areas on Madura Island that will function as a theme park and central business district, trading and service, residential, and public areas in the future (BPWS 2017). The expectation is that the development will generate more jobs and will increase people's access to the mutual benefits of the project.

The head of the Planning Department then introduced the development of a theme park in Bangkalan especially designed for Islamic marine tourism. The creation of this theme park is intended to mitigate the displacement and loss of livelihoods caused by the bridge construction. The groups targeted by this mitigation policy are mainly fishermen, the Muslim community, and those who have been displaced from their land. The basic idea is to increase the quality of their social and economic lives by creating jobs within and outside the tourism industry.

First, fishermen will be able to sail their boats for touristic purposes in the theme park and take part in workshops to learn the skills needed to work in the tourism sector. This growing expectation of future benefits from the tourism sector was evident in one of the fishing villages in Kenjeran district, Surabaya. The community leader there confirmed that the previous government had promised tangible economic benefits if people supported the development. However, he also said that after eight years of operation, the communities are experiencing more externalities than promised benefits. The participants from this village experience such externalities as noise, unemployment, and a decline in income from fishing. In terms of environmental impacts, the fishermen experienced a huge loss of fish supply due to the project construction. As a fisherman we interviewed told us:

Before the erection of the bridge pole, the fortune [fish] was always there, but now it is hard to catch fish. During the construction, a big explosion took place that later killed the fish.

Second, a series of workshops were organized for the Muslim community living near the bridge. In the past, the religious leaders had opposed the bridge development due to the concern that easy access would bring into the island new cultures from the metropolitan area that were considered inappropriate for the locals' values. Therefore, since Madura Island is well known for its culture and majority Muslim community, the development agency tried to introduce the concept of sharia tourism² to the theme park to assuage the worries about endangering the culture and religious values of the local people.

The decision to develop tourist attractions near the bridge was also triggered by tourism activity generated unintentionally by the existence of the bridge. Many tourists come from the surrounding area to see the bridge because it is an iconic symbol of Surabaya and Madura. The popularity of the bridge is also clearly reflected by the souvenirs and T-shirts sold by local people on the Madura side of the bridge. The interview with the owner of a souvenir stall revealed that, in the peak season, she can turn over approximately 135 euros a day by selling souvenirs to visitors, an amount that she considered quite considerable. The emerging informal economic activity is also reflected by the existence of the many food stalls on the Surabaya side of the bridge.

The number of tourists is increasing not only in the area near the bridge, but also in remote locations on Madura Island. In Sumenep, we interviewed residents who live near Lombang beach, a tourist attraction in the eastern part of the island. They acknowledged that these days a significant number of tourists visit the location:

From my personal experience, after the development of Suramadu, a lot of tourist buses come and go on a daily basis within this city. Especially in the natural tourism spot in Lombang beach and Slompeng beach. I do not know for sure whether it is because of Suramadu or not, but these days the government is working to develop the city's infrastructure, especially the main access road from Suramadu to the furthestmost point in Sumenep.

Third, in terms of displacement, the former farmers in the area adjacent to the bridge on the Madura side experienced a loss of livelihood because their farms or fields were displaced by the project. Although these farmers accepted compensation that was sufficient to buy or build a new house, they do not have any skills other than farming, and the money will eventually run out. They therefore hope that the promised job opportunities created by the development plan will be realized soon. As a community figure explained:

They promised to create new jobs for the people who had to be resettled. When all the development has finished, more low-skilled jobs will become available in parking lots, cleaning services, mall operations and the hospitality industry, and the big mosque operation will also start. So people without a degree or diploma will be able to apply [for jobs].

4.1.2. Temporal scale

To capture the importance of time in shaping people's perceptions of megaproject development, Figure 4 depicts the changing perceptions of people throughout the development's lifecycle. The figure shows that the perceptions of respondents living further from the bridge tended to be more positive after the bridge had been in operation for eight years. Almost half of the respondents in the remote location of Sumenep feel that they have a more positive view of the bridge than they had before, during the planning and construction stages. However, the trend is different at the locations near the bridge (Figure 4). As many as 72.1% of the respondents in Surabaya and 61.5% of those in Bangkalan disagreed with the statement "At the usage stage I have a more positive view about the bridge than during the planning and construction stages."

A possible reason for the positive change in perceptions is that the respondents finally feel the benefits now that the project has been built. In response to the survey's open question "What is the reason behind the change?," some respondents emphasized the decrease in travel time between Surabaya and Madura. Others said that they could feel other benefits at the usage stage, such as more convenient and safer transportation, the existence of investors, and the increase in the city's economic quality.

The reason for the opposite answer found in the other two locations, Surabaya and Bangkalan, is that the respondents highlighted the externalities that they experienced, as mentioned above. The importance of time is reflected in the fact that the respondents living in the adjacent area felt the need to accept the project in both the planning and the

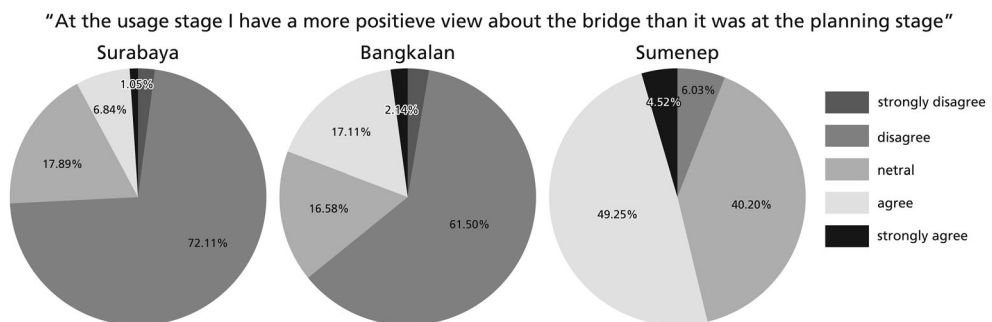


Figure 4. Changing perceptions of the respondents based on location.

construction stage due to insufficient information from the authorities about the project and the compensation for land acquisition:

There was no communication [with us], only with the heads of the village, maybe religion leaders. [We] did not know anything, and suddenly the bridge was built. The citizens did not know anything, no information at all. (Resident in Pangpong)

[We] were only invited once, when [they] revealed the [land] price. There was no negotiation, only one meeting and the price was set. (Resident in Pangpong).

As a result, during the planning and construction stages, the residents' acceptance was derived mainly from their powerless condition and the feeling of "prison dilemma"³:

What would we have done if we didn't support the project? We did not know anything [about the project]; as lay people, we just followed [the government]. Nothing we could do. It is useless to disagree [with the government]. (Resident in Pangpong)

There was some rejection, but nothing could be done if your land was assigned for the bridge location. For instance, if five of six people gave up their land and accepted the compensation money, the one left had no choice but to do the same. (Resident in Pangpong)

Later, however, this initial conditional acceptance evolved into considerable support due to the benefits of the bridge, namely reduced travel time and more opportunities for further development.

4.2. Extraneous stimuli from context-specific Suramadu development practices

Besides the benefits and impacts of the project, the case study also shows that the context of the development plays an important role in shaping people's perceptions. To understand the context of the development, it is important to first look at Indonesia's planning culture, which has been shaped by continuous interaction between indigenous customs and foreign influences. In terms of foreign influences, the use of rigid zones and codes as growth control mechanisms are highly influenced by the Dutch planning culture, and the utilization of land use management is derived from recent American planning models and approaches (Cowherd 2005; Hudalah and Woltjer 2007). Meanwhile, the indigenous cultures influence public management and decision-making processes. In particular, Javanese political cultures (the Javanese are the major ethnicity in the research area) shape the clientelism and centralistic planning system (Hudalah and Woltjer 2007). In the case study, the very strong role of the state and the characteristics of Javanese political cultures (Hudalah and Woltjer 2007) constituted the processes of Suramadu development.

Reflecting on the case study, there are two findings that deserve to be underlined, namely (1) the approaches used by the development agency to provide information about the project and (2) the land acquisition processes. The bureaucratic process inherited from the Dutch planning culture means that it takes people a long time to get their opinions about developments heard by the decision makers. It was shown in the previous subsection that people had several concerns regarding the development, but they could not engage with the decision-making processes. This condition also links to the strong role of the state in developing the bridge, which resulted in limited information about the project – especially in terms of its negative impacts – being given to the people (see the previous subsection). The survey revealed that the majority of the respondents felt that, at the

planning stage, the government did not provide sufficient information about the negative impacts caused by Suramadu (see [Figure 5](#)).

This result explains why the interviewees suffer externalities from the megaproject and feel let down by it. Only one-fifth of all respondents from all locations felt that the government had provided adequate information about the negative impacts of the project at the planning stage.

Meanwhile, the clientelism and discretionary approaches that have characterized Indonesian governance culture (Hudalah and Woltjer 2007) explained the initial conditional support for the bridge. People tend to accept decisions from higher level authorities regarding future developments. This condition is also supported by centralistic Javanese tradition, which is characterized by a paternalistic political culture, in which the authorities have ultimate power in decision-making processes (Hudalah and Woltjer 2007).

This paternalistic political culture is clearly reflected in the land acquisition processes. Displacement became an issue in the surrounding area on the Madura side due to miscommunication between the development agency and the local people about the compensation measures. As insisted upon by the head of the Pangpung subdistrict, most land acquisition took place at people's farms or in their fields. The affected groups were confused about the implementation of the new land acquisition law. The law was changed in terms of what should be compensated for – just the land or also the commodities produced on the land. The law was initially aimed at facilitating land acquisition during the building of the bridge, but was changed during the usage stage of the bridge to facilitate the urban development projects surrounding the bridge, with the aim of stimulating economic development. As a result, people were disappointed by the smaller amounts of compensation money they received under the new law. The head of the subdistrict said that he believes there is room for improvement as regards communicating how the compensation for the affected groups is arranged.

Despite this disappointing result, a set of mitigation policies has been prepared by the development agency to accommodate different views from the local people, either as a targeted or an affected group. The development agency is attempting to narrow the gap between the top-down broader economic ambitions of the development and the local knowledge shared by people in the surrounding areas. The set of mitigation policies includes an inclusive urban redevelopment project near the bridge that takes the local reality into account, as explored in the previous subsection.

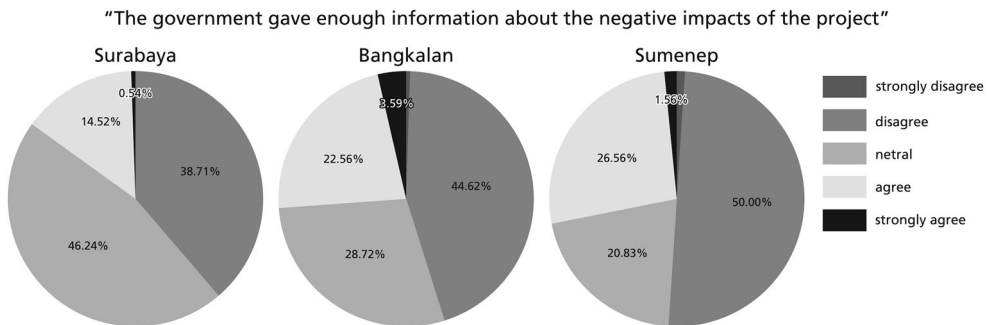


Figure 5. The provision of information about negative impacts of the project.

Table 4. Stimuli captured from the case study that influence people's perceptions of megaproject development.

Stimulation of perceptual behavior	Review of megaproject studies	Findings from the case study
Megaproject externalities	Benefits of megaproject: direct–indirect impacts with space and time dimension: 1. Spatial scale New space creation Forced displacement Loss of livelihood Environmental impacts: noise, water and air pollution, loss of biodiversity 2. Temporal scale People's perceptions change	Reduces travel time, broader economic impacts, attracts investors: 1. Spatial scale Redevelopment of KKJS Environmental impacts during the construction and usage stages: noise Fishermen and former farmers lose their livelihoods 2. Temporal scale Perspectives of respondents from further away have become more positive. Perceptions of some respondents living closer to the bridge have not changed, due to externalities and a lack of shared benefits.
Context-specific/extraneous stimuli	Context of the area, context of the development	1. Miscommunication about compensation law 2. People less well informed about the negative impacts 3. Socio-anthropological approaches from relevant agency

Table 4 sums up the empirical findings by summarizing the kind of stimuli that occurred.

5. Conclusion and discussion

Megaproject studies have been limited to project managerial practices and pay only limited attention to people as a central theme, and especially their perception of the functional megaproject development. In fact, people are one of the main drivers of successful megaprojects (Mišić and Radujković 2015). The present research offers an analytical approach adapted from the psychological field that can be used to understand the basis and nature of perception making about megaproject development. This might contribute to bringing people back into the study and practice of megaproject development. In addition, the debate between the proponents and opponents of megaprojects regarding the provision of public good (Orueta and Fainstein 2008) could be resolved to improve society's acceptance of such projects. This is in line with what Friedmann (2000) argues, namely that resistance to attempts to shape or reshape people's lives is inevitable, and there is a social responsibility to do less harm to society. Our work also potentially contributes to preventing the clash between parties about the vision of the development (Herrold-Menzies 2006). It also provides a practical approach for post-political governance (Allmendinger and Haughton 2012), which replaces conflicts with consensus and negotiation. Our analytical approach is particularly important for Allmendinger and Haughton's (2012) idea of utilizing governance, community, and partnership to achieve consensus. Since our framework includes taking into account the context-specific stimuli (such as governance and dominant political cultures), it would fit nicely for there to be a consensus in the tailor-made negotiation process. This would solve the

problem of exclusive definition of public interests by the most powerful actors in megaproject practices in Southeast Asia, an issue that is raised by Shatkin (2008).

Further, regarding the way different groups perceive the bridge development, the case study shows that, for a functional transportation project, the overall picture seems to be positive, despite the negative externalities and disappointments experienced by the directly affected groups of people. For example, the vast majority of respondents feel positive about the reduced travel time brought about by the bridge. Nevertheless, in terms of spatial proximity, some of the affected groups feel negative due to the externalities such as loss of livelihood, environmental impacts, unrealistic promised benefits, and forced displacement. This reflects that the ability of a megaproject to transform space with its tangible negative impacts (Gellert and Lynch 2003) might be outweighed by the importance of impact assessment to manage the externalities and create better outcomes for local people (Vanclay 2016).

The prospects are not always negative, however. Studies show that people are willing to be displaced and resettled if the mitigation strategy offers them a better life (George and Rajan 2015). This is clearly depicted by the case study of the mitigation strategies carried out by the authorities to bridge the gap between people's opposing and supporting views. The mitigation strategies contribute to encountering the marginalization of impacted communities, as underlined by Magee and McDonald (2006). Here, our framework of perception making process can be used as a baseline to design a tailor-made mitigation strategy.

Moreover, regarding changing perceptions, two intriguing findings are worthy of highlighting. First, the results of this study indicate that, across different spatial scales, the externalities and certain context-specific factors of the development contribute to changing people's perceptions of megaproject development. More particularly, the traditional inverse relationship between distance and perception once again holds true: The greater the physical distance from the megaproject, the more benefits people experience and the more positive their perceptions. Second, changing perceptions were observed, which indicates the importance of the temporal scale in perception making. This is a similar situation to what has been described by Molle and Floch (2008), who stated that the temporary impacts of the construction tend to lead to more negative perceptions, while the total permanent impacts at the usage stage produce more positive values. During the process of perception making, at the early stage there is a possibility that people might have unrealistic perceptions of megaprojects, because they have not yet seen the benefits.

A fruitful implication resulting from this research is the need to incorporate, to a greater extent, the real value behind a megaproject by including the impact of perception making on perceived externalities. The practice of bridging pro-growth and pro-poor is not without problems (Sutherland, Sim, and Scott 2015), but this study offers some useful lessons in reshaping this reality. It offers a conceptual framework to capture a real-life situation of society caused by megaproject investment, in relation to the debate between entrepreneurial strategy and general public exclusion (Qian 2011). The way people perceive actual externalities is important in conceptualizing the real success of megaproject investment. "Perception is reality" (Vanclay 2012, 152). Perception shapes people's actions and feelings and perceived impacts are the real social impacts (Vanclay 2012). Therefore, the role of mitigation strategy in bridging people's perspective and development process and reshaping the reality is important, especially to the success of the project.

We of course acknowledge that this research needs further exploration. Our empirical findings show that a megaproject can sometimes have more than one project function (i.e. transportation). The bridge also functions as an iconic symbol that generates secondary benefits for the people in terms of tourism that are more than just economic benefits. Unlike other megaprojects that were designed for mixed functions (e.g. Lehrer and Laidley 2008), Suramadu was initially designed only as a functional transportation megaproject to connect a remote area – Madura – with the city of Surabaya. The tourism function that emerged has nothing to do with the designated main function and can also be a trigger for broader development and redevelopment projects in the surrounding area. As a functional megaproject, the legitimacy of Suramadu showcased the need for reliable transportation infrastructure to improve access to Madura from Surabaya. Even though the bridge has proven to reduce the travel time, there were conflicts between the affected groups and the authorities. The emerging tourism function of Suramadu indicates a place-specific discourse of megaproject development, as also underlined by Balke, Reuber, and Wood (2018), which is interesting for further exploration.

Finally, the outcomes of this study lead to two specific recommendations for future research. First, we recommend further research on the creation processes of the organic or unplanned place-specificity of megaprojects that later generate mixed functions of the project. In common practice, mixed functions of megaprojects (Lehrer and Laidley 2008) are designed as a concept to offer benefits for everyone in order to obtain public support (Allmendinger and Haughton 2012). In our case, however, the emergence of the mixed function of Suramadu (transportation and tourism) was an organic process. Second, although this paper hints at the attempts to understand the local people's perceptions as a means to reach consensus between the authorities and the affected groups of people about expectations and anticipations concerning the megaproject, as highlighted by Allmendinger and Haughton (2012), it is necessary to conduct further research on which specific factors appeal most as regards people's perceptions. The most prominent factors could provide further input for planning mitigation strategies that work best in the context of the development and for bridging the gap between top-down and bottom-up perceptions in post-political planning.

Notes

1. A person in the community whose character is prominent and famous and has influence on the order of society. A community figure is selected informally through a common (unwritten) agreement based on his/her attitude, education, job, and social status (Suhendi 2013).
2. For further example see Rindrasih (2019).
3. See: Rapoport, Chammah, and Orwant (1965).

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was funded by the Indonesia Endowment Fund for Education (LPDP), Republic of Indonesia.

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Appendix

Table A.1. Survey questions

U20	I feel positive about Suramadu Bridge
L27	I supported the project (at the planning stages)
L28	I got sufficient information about the project (at the planning stages)
L29	The government gave sufficient information about the positive impacts of the development (at the planning stages)
L30	I knew the positive and negative impacts of the project (at the planning stages)
L35	I was against the project (at the planning stages)
L36	I feel that the project development has opened new employment opportunity (work in construction)
L37	I feel that the construction of the project caused air, water, and noise pollution
L38	I feel that the construction of the project affected the biodiversity
L39	I supported the project (at the construction stage)
L40	I feel displaced from the place I used to live because of the project
L41	I had to be resettled from my home because of the project
L42	I saw a lot of people resettled because of the project
L43	I feel the compensation is not fair
L44	I was against the project (at the construction stage)
L45	I feel that the project development has opened new employment opportunity (non-construction job)
L46	I feel that my income has increased because of the project
L47	Because of the project, many investors and new businesses come to Madura and Surabaya
L67	I feel the project benefits me
L75	My perception about the project changed between the planning and the usage stage
L76	I feel more positive about the project now than I did at the planning and construction stages
L77	What is the reason behind the changes?