



# Living on the edge: Identifying challenges of port expansion for local communities in developing countries, the case of Jakarta, Indonesia

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## ABSTRACT

A port-city interface can be characterized as an area of conflicts between port development and city land-uses. Unfortunately, most research is limited to a technical and managerial perspective on port development and focuses less on the impacts on the communities in the area. This paper offers a new direction to acknowledge the impacts of port development on the community by borrowing from literature on rural-urban fringes, as there are similarities between the port-city interface and the rural-urban fringe as areas with conflicting interests. The port community is divided into the community of interest and the community of place. Based on this, a set of implications arising from how the community might experience the impacts of port development is presented. These implications are operationalized in a case study of the expansion of Tanjung Priok Port in Jakarta, Indonesia. The findings are differentiated for the four most prominent communities that are vulnerable to the impacts, namely fishermen, port workers, seafood processors, and industrial and other types of workers. They are likely to experience two indirect effects of the port development, namely resettlement and loss of livelihoods. This shows how vulnerable the communities living on the edge of the new development are, mainly due to their livelihoods' dependency on the blurry boundaries between port and city.

## 1. Introduction

The port-city interface, an area that Hayuth (1982) defines as an area in transition, is a geographical line that separates port land-uses from urban land-uses and is often associated with an area of conflicting ideas and objectives on both the port and the urban side (Hoyle, 1989). The conflicts are depicted as a trend in which the city expands rapidly towards the port, while the seaport expansion moves away from the city relatively slowly (Wiegmans and Louw, 2011). From the port development side, there are two issues that bring conflicts to the port-city interface. First, policy-makers are more and more in favour of developing a port region as a growth pole. However, this tends to ignore local and regional characteristics of the port area (Ducruet, 2016). Second, the trend of port regionalization, in which market dynamics impose a shift of freight distribution systems inland within seaport regions to foster efficiency, poses considerable socio-economic conflicts related to scarce local resources used by the ports (Notteboom and Rodrigue, 2005).

As global hubs, ports receive increasingly strong positive and negative impacts stemming from port expansion. Positive impacts include employment opportunities, regional economic growth and added value

to a particular area (Merk, 2013). However, these positive economic impacts usually occur at a broader scale (regional, national) as an indirect effect (Chang et al., 2014). If it occurs at the local scale in areas adjacent to the port, it is mostly limited to port-related job opportunities. At the same time, direct negative impacts are usually at the expense of local communities in the port-city interface, such as environmental degradation or loss of livelihoods of traditional fishermen.

In most developed countries, affected communities in port areas have some power to raise their concerns and incidentally even have an ability to cancel the development. For instance, the development of the Europoort coastal-zone reclamation, a port industrial expansion in Rotterdam in the Netherlands, had been canceled due to refusal from the local community (Pinder, 1981). However, with different institutional frameworks across the globe, incorporation of the interests of affected groups of people is not always evident. It is important to explore the unexpected ways in which different policies and institutional contexts contribute to the implementation of port reforms in local communities (Ng and Tongzon, 2010). Careful consideration is therefore needed to copy best practices of governing port-city challenges to different contexts (Witte et al., 2016), to avoid implementing 'western solutions' in developing countries (Ng and Pallis, 2010). In the case of

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developing countries, there is a complex relationship between the seaport and the hinterland. The port sector is struggling with the demand of economic acceleration (Ng and Tongzon, 2010), while local communities in immature economies tend to have less power to influence policy-making related to implementation of port activities in the area.

Focusing on developing countries, local port communities are vulnerable for three reasons. First, the livelihoods of these communities depend greatly on their surrounding environment –the port, the sea or the city. Even small direct or indirect changes in the area might destroy their livelihoods. Second, in general they have weaker interests in the broader economic benefits of the port development. In this, proximity to the port area is not always beneficial for profiting from the broader economic benefits (Witte et al., 2017). The small benefits that ports bring to the local economy make communities the weakest actors in port development processes (Hinka et al., 2016; Jung, 2011). Third, most impact studies ignore the impacts on workers and communities that depend on the port (Ng et al., 2014), despite the need to preserve the quality of life in the surrounding neighbourhoods and to incorporate a preservation effort in any port assessment (del Saz-Salazar et al., 2012). The formal impact assessment is usually performed to gain social legitimacy (Vanclay, 2012), rather than to capture the local reality of the communities. In some cases, such as the Colombo Port-City project in Sri Lanka, the construction did not follow the approved reports that resulted in a gradually polluting environment (De Silva et al., 2015). All in all, research on the social implications of mega-projects at the local community level is rather limited (Di Maddaloni and Davis, 2017), especially in the context of developing countries.

This phenomenon is not unique to port–city interfaces, but also occurs in other areas with conflicting land uses, such as the rural–urban fringe, which is defined as an area of transition between the rural and the urban (Gallent et al., 2006). Like the communities in a port–city interface, the communities in a rural–urban fringe are dependent on that fringe and are therefore vulnerable to any changes or policy interventions in the area. Taking such similarities as a point of departure, this paper analyses local communities in the port–city interface area in a developing countries context and explores the possible impacts when a new port is developed. The research question is: *‘What impacts do local communities in the port–city interface, in the case of developing countries, have to face due to new port expansion?’*

This paper is relevant to acknowledge the impacts of port investment on the community, especially when their livelihoods are so dependent on the area that any development in the area might jeopardize those livelihoods. With the massive foreign direct investment in transport infrastructure to developing countries worldwide, such as China's recent Belt and Road initiative (Huang, 2016), this paper captures how strategic economic ambitions behind port expansion in developing countries can negatively affect local communities in the port-city interface and how accommodating their concerns can be beneficial for more inclusive port development. This paper will contribute to port governance studies as categorized by Pallis et al. (2010), especially on the discussion of cooperation with the port community in seaports.

The case study is Tanjung Priok Port expansion in Jakarta, Indonesia. For the last couple of decades, port regionalization has taken place here at a large scale with development of multiple inland terminals, corridors and freight distribution centres. Also, for over a century the port has experienced an enormous influence on the megacity of Jakarta, and especially on the communities living near the port. This port is the most important in Indonesia, handling approximately 70% of the country's globally traded goods and 29% of the domestic container traffic between Java island and other parts of the country (Ginting et al., 2015). Not only is this case representative of the typical conflicts between the growth of port and city, but also the vulnerable communities are more visible in the case of rapidly developing countries such as Indonesia.

The paper is structured as follows. The following section discusses

theoretical perspectives of the rural–urban fringe and the port–city interface. Based on this, the third section introduces the community response options as proposed by Gallent et al. (2006), which are used as an analytical frame in the empirical part of this paper. The fourth section introduces the case study and the data collection. The fifth section presents the results of the empirical analyses. The final sections summarize and discuss the results in light of the impacts of port development on local communities in the port–city interface.

## 2. Port–city interface and rural–urban fringe: two areas in conflict

Using the work of Gallent et al. (2006), this section explores the theoretical foundations of communities in the port–city interface setting by borrowing from literature on rural–urban fringes. It starts by looking at the struggle experienced by the rural–urban fringe as an area of conflicts between rural and urban interests. Then the port–city interface is introduced, as is the notion of communities in port–city studies. Lastly, similar characteristics between both interfaces are outlined as a point of departure for the research design presented in the subsequent section.

### 2.1. Rural–urban fringe

Literature on the rural–urban fringe mainly concerns how ecological and demographic change influences local communities to construct their own images of rurality and urbanity (Garner, 2017). In 1937, Smith introduced ‘urban fringe’ as a developed area outside the corporate limits of the urban area. Later, the term evolved into ‘rural–urban fringe’ due to its two identities: the urban fringe and the rural fringe (Pryor, 1968). The urban fringe is in contact with the central city, whereas the rural fringe is detached from it. The tension between rural and urban land-uses was historically due to cities putting undesirable yet essential industries in rural areas, excluding them from the urban per se (Wehrwein, 1942).

Further, the rural–urban fringe is also defined as a transition area. Bryant et al. (in: Qviström and Saltzman, 2006) define the fringe as the transition stage from rural to urban area with a slight doubt about its function as urban-oriented and conversion to urban use. The rural–urban fringe is also seen as the transition zone between a fully developed area and a more rural area, where a mixture of urban and rural land-use takes place, including essential service functions that are specific to the fringe (Gallent et al., 2006). It is for instance used as a residential area, dump site or secondary lot services, such as amusement parks or golf courses.

### 2.2. Port–city interface and port regionalization

The port–city interface was first introduced by Hayuth (1982), who believes that the emerging port–city interface is derived from spatial and functional trends caused by the changing coexistence of seaport and port cities regarding new developments in maritime transport and modern port operations. This condition leads to a more attractive and accessible urban shoreline for the public. Later, Hoyle (1989) added that any development in the port–city interface should achieve a balance between technological changes and ecological restraints, and between maritime viewpoints and urban planning conceptions (Fig. 1). In the case of developing countries, the interface shows more conflicts as compared to developed countries. The reason is that in the mature economies, port authorities perceive containerization and intermodal services as an efficient way to connect ports to inland cities. In contrast, port authorities in developing countries (mainly in Asia) struggle more on developing and improving the function of ports and inland cities symbiotically (Ducruet, 2006). Also, unlike mature economies in which policy preferences and political borders are less significant, developing countries struggle more with the centrality of the port to the city (Ng and Gujar, 2009).

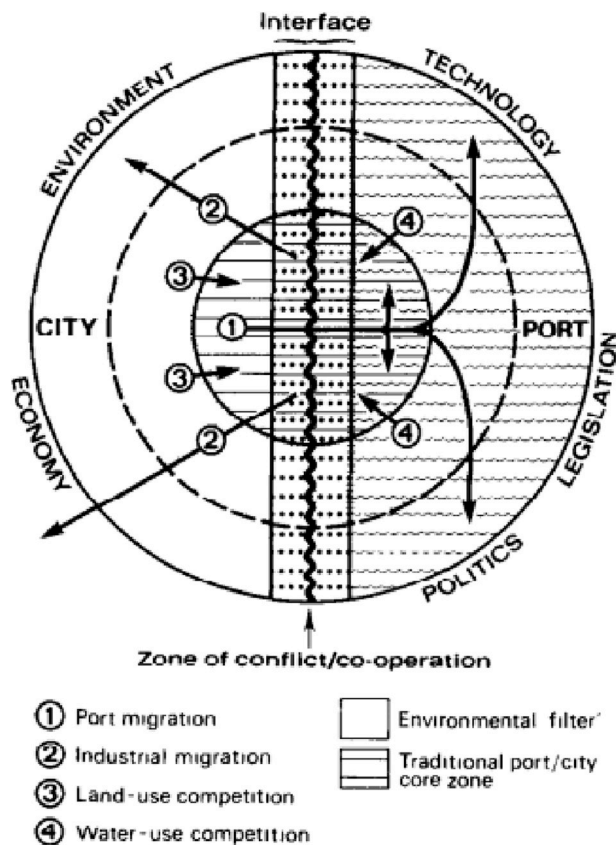


Fig. 1. The port-city interface as a zone of conflicts Source: Hoyle (1989).

The tension from the port side comes from the need for reliable maritime transport. Limited available land for port expansion has pressured many port authorities to improve their capacity and performance through port regionalization, creating logistic regions in the hinterland (Notteboom and Rodrigue, 2005). In doing so, ports aim at maximizing the efficiency of the configuration of the “port triptych” (i.e. the port, hinterland and foreland, cf. Vigarie, 1979) in one port region (Ducruet, 2016). With the expansion of port activities to the hinterland, there is a new opportunity to reconnect the relationship between the city and port. Debrie and Raimbault (2016) underline two plausible reasons. First, not only has the port expansion reached the urban area, but also the city expansion is slowly approaching the port facilities, creating new interfaces. Second, there is a policy ambition of new urban development. Therefore, it is important to define and agree on the shared goals between city and port activities.

As global hubs, port expansion has positive and negative impacts. Based on the 2013 OECD report, the positive impacts of port expansion range from employment opportunities to the area's added value, and the port-cities benefit mostly from the industrial clusters in the port area and the plausible economics of scale as well as related-knowledge transfer (see Merk, 2013). The OECD report also claims that the vast majority of indirect effects as well as the backward and forward linkages of port clusters spread out over the whole country, while taking place less in the port-city itself. According to the report, the port-city interface has to bear the consequences of the environmental impacts (e.g. air emissions, water quality, waste, loss of biodiversity, etc.) that in the long run might influence the health of the population, in particular the poorer parts of the port-city interface.

These unbalanced development impacts contribute to conflicts in the port-city interface. There are major socio-economic conflicts connected to seaport development and choosing the optimal port location for a given region (Rodrigue and Notteboom, 2006). For instance, the local community might request a reasonable compensation for the

scarce local resources that are used by ports when expanding (Notteboom and Rodrigue, 2005). Besides the impacts stemming from the port side, the port-city interface also experiences tensions from urban development. This might ring especially true for the Asian context, since ports are required to follow the urban hierarchy, causing high congestion in the port-city interface (Ducruet, 2006). The difficulties in planning and implementing a project within this area result from the negotiation between objectives, influences and interests caused by various constraints on decision makers (Hoyle, 1989). They also reflect different forces and trends, including community attitudes and environmental sensitivities (Hoyle, 2000). Thus, the conflicts between the port and urban forces necessitate a balance between various interests concerning economic, transport, spatial and environmental values, which are reflected in the form of laws and regulations and informal institutional structures (Witte et al., 2014). In this regard, the role of the community is substantial in influencing the pattern and pace of any development and change, and its attitude might politically influence the process of change to a significant degree (Hoyle, 1999).

### 2.3. Community of place and community of interest in the Port-City interface

Based on the experiences of rural-urban fringes, it can be argued that planning the port-city interface as an area with similar conflicting interests and objectives is to some extent problematic. There is a need to make more significant efforts to underline the environmental and social issues, rather than just the economic achievement of the planning intervention in the port-city interface (Huang et al., 2011). To this end, we shifted our focus to the affected local port communities.

To identify these communities, we followed Thomsen et al. (2009), who divide communities in a coastal context into community of place and community of interest. First, regarding the community of place, the definition is related to geographical location. It refers to people sharing a common locality (Selznick in Kepe, 1999), like a town, city or neighbourhood (McMillan and Chavis, 1986). The community of place is important in the port-city interface because of the place attachment created. Place attachments are emotional bonds that people have with their physical surroundings, which informs a sense of identity, creates the meaning of lives, facilitates community and influences action (Manzo and Devine-Wright, 2013).

Second, the community of interest relates to a relationship in which social actors share common interests, resources controls and economic activities to make their livelihoods. However, they do not have to live in one locality (Kepe, 1999). The term ‘community’ implies more than just residence outside of an institution (McMillan and Chavis, 1986). It relates to the same shared values, worries and culture, like professional, spiritual, etc. The importance laid on the high dependence of a community's livelihood on the area, makes the community vulnerable to any changes brought about by development in the area. Various community groups are attached and interact, forming informal structures.

For this paper, the division is mainly based on the type of activities carried out in the shared-space setting – whether related to the port, the sea or the city – and on the administrative boundaries of the area in which the community lives, because it depicts their livelihoods' dependence on the port-city interface area. In this, each community experiences different impacts from either port or city development, generating value-based knowledge. Each community has different concerns and aspirations concerning their place attachment and sense of community. Thus, it is necessary to take into account these perceived impacts in the process of impact assessment (Vanclay et al., 2015).

Summing up this section, we acknowledge the similarities between both interfaces (Table 1). Both areas have communities of interest and of place that are highly dependent on the area they live in. However, the area itself is full of conflicts as a land-use transition that, in this case, makes planning intervention in the interface area have a severe effect on the communities. Acknowledging the communities'

**Table 1**  
The similarities between the port–city interface and rural–urban fringe.

Characters	Port–city interface	Rural–urban fringe
Blurred boundaries	The transition zone between port and city	The transition zone between rural and urban area
Community	Sea-dependent community Port-dependent community City-dependent community	Rural community Urban community

dependence on the conflicting area is important to analyse the impacts of the planning intervention on the area.

### 3. Research design

This section presents a set of implications arising from the impacts of planning interventions in the port–city interface. We found that the intervention options put forward by Gallent et al. (2006) in the rural–urban fringe literature were useful as a potential analysis scheme suitable for studying the community on the port–city interface setting. There are three possible options in handling the conflicts: *do nothing*, *understanding fringe* and *seeking change*. These options are instrumental in shaping spatially inclusive policies and innovations in a port–city interface context in accordance to the community living on the edge of the city and the port (Table 2).

#### 3.1. Intervention option 1: do nothing

Gallent et al. (2006) perceive the fringe as an area with an infinite capacity to employ the spill-over from the urbanized world. The fringe is seen as the most suitable place for illegal dumping, and the relevant plans ignore the features of low-density development at the edge. In the case of the port–city interface, this option implies spill-over on the boundaries between port and city. The trend of port regionalization in the port region brings such development both in the foreland and in the hinterland with the active involvement of the port-related stakeholders. However, the main challenge within this option is the inability of most coastal cities to engage with simultaneous port expansion and population growth. Like in the case of the rural-urban fringe, policy-makers tend to have a blindness towards the quality of low-density development at the edge (Gallent et al., 2006). The intervention focuses solely on increasing the efficiency of transshipment and other port activities imposed by market forces, leaving only a very limited amount of space for the local communities' concerns.

In this sense, the existence of a port generates certain characteristics of its urban life, with a large dependence of the community on port development and the city's economic returns (Boulos, 2016). Another challenge is that port and city authorities disagree about how renewal

**Table 2**  
The implications of development interventions on the port–city interface.

Characteristics port–city interface	Do nothing	Understanding fringe	Seeking change
Blurred boundaries The transition zone between port and city	<ul style="list-style-type: none"> <li>● Densely populated city</li> <li>● Environmental degradation due to maritime transport activities</li> </ul>	<ul style="list-style-type: none"> <li>● Land development conflicts on the interface area</li> <li>● Battle of resource management</li> <li>● Spatial-economic disintegration</li> <li>● Environmental degradation due to the development</li> </ul>	<ul style="list-style-type: none"> <li>● Difficulties in combining local and regional economic, social and environmental factors</li> </ul>
Community Sea-dependent community Port-dependent community City-dependent community	<ul style="list-style-type: none"> <li>● Low quality of life due to advanced technology in port activities</li> </ul>	<ul style="list-style-type: none"> <li>● Fear and anxiety</li> <li>● Direct and indirect impacts on the community</li> </ul>	<ul style="list-style-type: none"> <li>● Broader indirect impacts working both locally and regionally</li> <li>● Requiring careful negotiation with the community for a win-win solution</li> </ul>

should be done, although they do understand the underlying problems such as the displaced community or the restructured economy (Hoyle, 2001). These challenges sometimes make the port–city interface, what Gallent et al. (2006) would call, an area with unlimited capacity to host the exiles of the urbanized world.

There are two implications to this. The first is environmental degradation. The port–city interface as an area with insufficient sustainable interventions is a burden on the urban environment, leading to social issues and social impacts caused by maritime transport, such as air pollution and maintenance dredging (Schipper et al., 2017). The pollution from massive port activities sometimes hinders the city when the sprawl from urbanized area reaches the coastline (Boulos, 2016). The second implication is the low quality of life of the communities around the port. This is mainly a result of the area being used for the widespread development of container terminals and bulk cargo handling facilities (Hoyle, 1989). The urban economy still benefits from the added value of port activities (e.g. employment creation in logistics), even with the spatial separation between the urbanized city and the busy port (Ducruet and Jeong, 2005). However, the skills of port workers are often too low to keep up with the evolution of advanced port technologies, such as cargo automatization (Hinka et al., 2016). This is especially evident in the case of developing countries. As a result, a significant decline in port-related employment is observable for port communities (Hoyle, 1989).

#### 3.2. Intervention option 2: understanding fringe

This option acknowledges the processes of framing the fringes and continues working with the processes to promote more sustainable qualities (Gallent et al., 2006). Originally, any development in the fringe is claimed to provide jobs and generate local economic benefits (Pacione, 2016). However, the main critique is weakened opportunities caused by the direct impacts of new challenges regarding land-use changes and meeting daily needs (Thuo, 2013). Even such an inclusive policy instrument might encounter objections from affected landowners who fear the social effects of urban growth (Taylor, 2016). In some cases, fear and anxiety are apparent even before a development takes off. The case of the Beijing urban fringe, for instance, had raised a spontaneous response to the inability of the state to fulfil the essential need for affordable housing and living space in the recent process of urbanization (Zhao, 2017), which leads to the existence of informal housing with increasing inequities in social development between rural and urban areas.

Regarding the port–city interface, land development conflicts are the result of different priorities captured by various related actors (Abdullah et al., 2012). Port expansion has a considerable bearing on a city's economic advantages, such as forward linkage effects, for example the use of port sectors by primary and secondary industries (Chang et al., 2014) and the creation of employment in both port-related sectors and other relevant industries (Jung, 2011). The development of ports also severely ruptures the port–city interface area, for instance

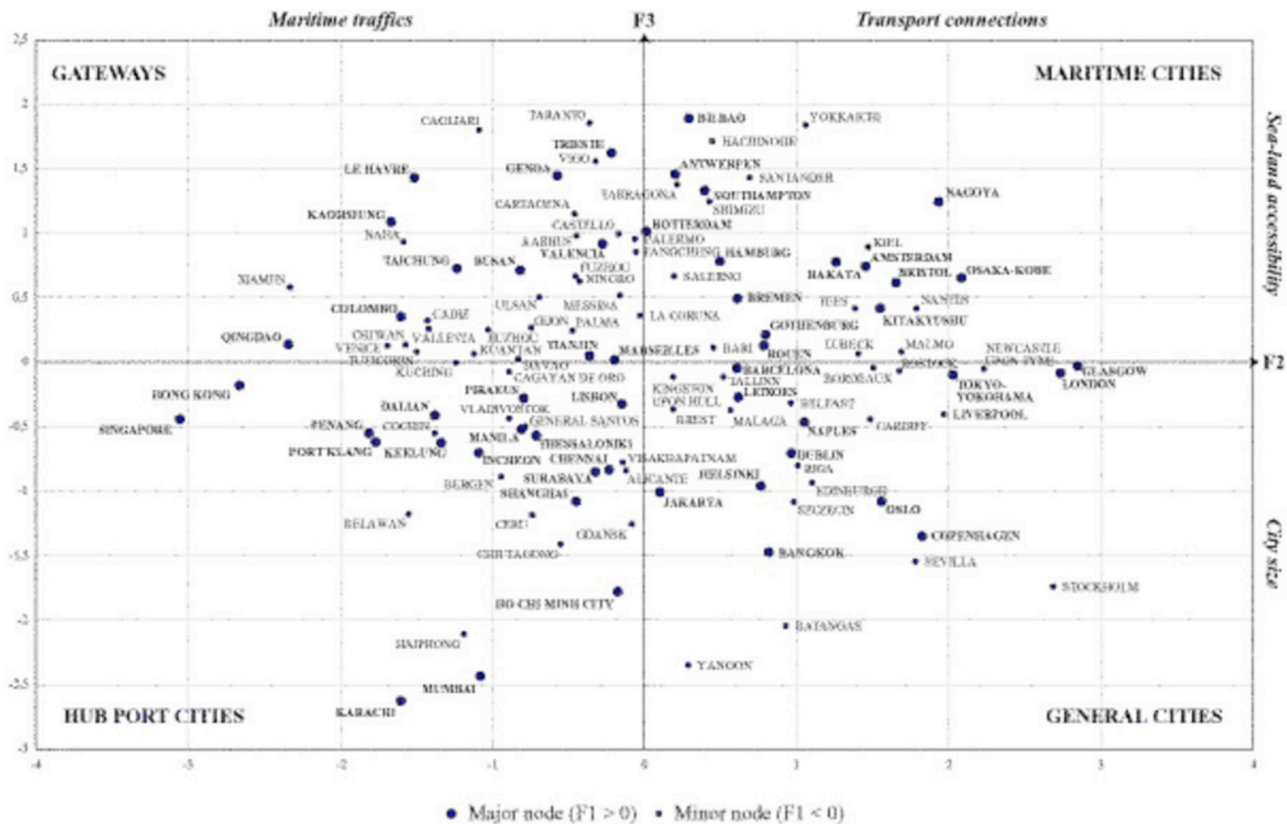


Fig. 2. Typology of European and Asian port cities Source: Ducruet (2006).

concerning spatial-economic disassociation and environmental impacts (Musso et al., 2015).

The effects can extend across administrative boundaries and do not automatically decline in intensity with distance from the site (Vanclay et al., 2015). Thus, it is essential to understand both the direct and the indirect impacts of changes (in this case, a port expansion project) on society at large. Such communication is necessary in this case to bridge the interests between authorities and communities. For instance, in Strasbourg, a dialogue was established between the communities and the port authority with the purpose of achieving shared goals of port–city development and maintaining the port activities (Debric and Raimbault, 2016; Witte et al., 2016).

### 3.3. Intervention option 3: seeking change

The last option aims to reshape the edge into a different image from a spatial planning perspective (Gallent et al., 2006). In a port setting, the port authorities can attempt to develop projects that enhance the image of the port and intensify its spatial and socioeconomic relations with the city (Daamen and Vries, 2013). Because conflicting interests remain among port and urban authorities, achieving win–win solutions is a challenge. A clear example is waterfront development versus global port development, which usually involves reclamation of the shore. In Corinth (Greece), for instance, an urban waterfront project transformed the commercial port into a city gateway that combines a technical port with a massive centre of social activity, shopping and entertainment, characterized by easy access and an abundance of walking paths and public places (Zazzara et al., 2012). This approach goes beyond conventional planning. In particular, it attempts to serve the overall well-being of the entire port city by providing attractive spaces (Ducruet and Jeong, 2005).

However, in practice, it is difficult to address a new model of port–city relationships because a refined combination of local and

regional factors must be taken into account (Ducruet and Lee, 2006). The search for a shared vision may be present, but it is rarely entirely successful and even raises the question whether the redevelopment is an urban success story (Hoyle, 2000). The experience of Asian port cities shows how the regional environment has shaped specific local conditions in port cities (Lee et al., 2008). For instance, South Korean port cities had to deal with the risk of making the urban spaces unattractive to Seoul urban concentration and foreign neighbouring port–industrial poles caused by static port functions (Ducruet and Jeong, 2005). Another implication is that developing attractive space through water-front development projects, for instance, tends to turning the table for the exiles of urbanized world being replaced by the elites living in luxury.

Therefore, ‘seeking change’ also means that the malleable processes to the affected community could be fostered through creating a dialogue with the secondary stakeholders. According to Doooms et al. (2013), this can be done through the incorporation of the dynamic spatial dimensions of actors’ interests and interactions by decision makers. Doing so, instead of being displaced by the elites, the exiles can share the space with the elites and enhance their quality of life.

## 4. Case study and methods

Next, a critical analysis of area dynamics was performed for the case study of port expansion in Jakarta, based on the implications presented in Table 2. This provided an in-depth understanding of the landscape of the port–city interface and highlighted the fringe/edge character (Qviström and Saltzman, 2006). We start this section by introducing our case study, Tanjung Priok port, and then explain the data collection and the methods used.

#### 4.1. Tanjung Priok port development

Jakarta's Tanjung Priok is the busiest port in Indonesia, serving the majority of national and international import and export freight flows. Based on the typology of European and Asian port cities (Ducruet, 2006), the city of Jakarta is categorized as “general city”, a category that is dominated by the major urban centres. However, it is important to note that the position of Jakarta is also really close to the quadrant of “hub port cities” (Fig. 2). The local economy in hub port cities is highly dependent on the port functions through efficient concentration but limited intervention in the hinterland (Ducruet, 2006). Thus, we should not ignore the importance of the existence of Jakarta's port in shaping the local economy. This makes Jakarta as a port city relevant as a case study to observe and analyse a tension between port and urban activities.

The port is located in the northern part of the Jabodetabek metropolitan area, thus covering part of the populous Jabodetabek urban regions, which have more than 30 million residents. Based on the Master Plan of Tanjung Priok Port 2012, the port sees an annual increase in goods flows of up to 23%, and it is projected that this growth will continue. To deal with this, *Pelabuhan Indonesia II* (the Indonesian Port Corporation II) planned to expand the port and finish the entire development in 2030 with a total investment of 47 trillion rupiahs (almost 3.5 billion US dollars). This paper focuses mainly on the North Kalibaru terminal, which is also known as the New Priok Container Terminal (NPCT), which is part of the Tanjung Priok Port expansion. Three phases of the NPCT development are now at the construction stage. The first phase has been in commercial operation since August 2016; the other phases will comprise a total of seven container terminals and two product terminals as well as 411 ha of supporting area (NCPT1, 2016).

Also, the port development includes reclamation of the open shore in Jakarta Strait. The issue of reclamation is a sensitive issue for the local people in this area due to the planned Giant Sea Wall project. This project has sparked a debate at both the local and the national level. The aim is to enhance flood prevention and foster urban development under the name of the National Capital Integrated Coastal Development (NCICD). In the NCICD Masterplan, which is being executed by *The Indonesian Coordinating Ministry of Economic Affairs* (2014), it is stated that the plan will make a significant contribution to enhancing port activities by easing traffic congestion. It is also expected that by 2030, additional extensions of the port combined with other urban developments in the eastern part of the bay will have been completed. The expansion of Tanjung Priok port has positive impacts on increasing the economic growth in Jakarta and on lowering the national logistic costs as well as enabling regional industrial productivity, but further research is needed to involve the sustainability aspects of the development (Prakoso et al., 2017).

#### 4.2. Methods

Data was collected through qualitative interviewing. This method is most suitable to capture in-depth stories from local people and illustrate their daily lives within their local contexts. To discover the boundaries of the communities, we used the key informant technique. Through exploratory observation, we identified different local stakeholders along with their activities. We selected the informants through snowball sampling during area observation. A total of 102 formal and informal semi-structured interviews and three additional informal focus group discussions were conducted in ten sub-districts in February and March 2017 (Table 3). The informal group discussion was stimulated in the field setting with different community groups living on the edge of the port and city to discuss their daily lives (cf. Frey and Fontana, 1991). It aimed at exploring in-depth key questions for the individual interviews.

To grasp the perspective of the community of place, we observed the

**Table 3**  
Research data collection.

Key informant interviews	Total: 102	
Civil government organization	7	Formal interviews
Community leaders	8	Formal interviews
Residents	32	Informal interviews
Port workers	8	Formal interviews
Seafood processors	24	Formal interviews
Fishermen	10	Formal interviews
Transport boat workers	10	Formal interviews
Academia	3	Formal interviews
Informal Focus Group Discussions	3	

area within the legal administrative boundaries near the port that was expected to show a high dependency on the port and the sea (Fig. 3). We then interviewed community leaders and residents within this area. To gain stories from the community of interests, we held interviews and informal focus group discussions with different groups that we found in the field, related to activities in the port and on the sea, such as fishermen, mussel and salted-fish processors, and unskilled workers on transport boats and in the port. To operationalize the concept of ‘community dependency’ to the port/sea/city, we raised questions of how important the port/sea/city is for their livelihood and how they perceive it. Lastly, a document analysis was conducted on the NPCT port development policy. The interviews were all conducted in Bahasa Indonesia (i.e. Indonesian language) which is the informants' native language.

## 5. Result and analysis

### 5.1. Do nothing: ecological challenges to the port–city interface

In this sub-section, the problems and complexities of the area are explored to capture the idea that an ‘infinite’ capacity of the port–city interface is not feasible in practice. The port–city development forces in the study area are characterized by the growing Jakarta urban area and the need for Tanjung Priok Port expansion due to capacity constraints.

In 2016, more than 10 million people lived in Jakarta, of whom 1.7 lived in the coastal area (World Population Review, 2017). The data gained in 2017 shows that the employment in Jakarta is generated mostly by the service sector with 53%, followed by the trading and manufacturing industry with 34% and 13% respectively (BPS DKI Jakarta, 2018). The city has a growing presence in the global economy, as evidenced by the development of numerous high rise buildings, wealthy neighbourhoods and luxury shopping centres (Cybriwsky and Ford, 2001). In North Jakarta, there were at least five ‘Integrated Development Zones’ proposed solely in 2005 and 2006 with a total of more than 4 million square meters of residences, shopping and leisure areas (Padawangi, 2012).

The coastline in Jakarta faces ecological challenges such as decreased biodiversity and water quality, shifted ecosystems and destroyed habitats (Wolanski, 2006). The coastline has also experienced coastal environment-related complications such as depleted and contaminated fisheries, saltwater intrusion, coastal littering and land subsidence (Nur et al., 2001). Land subsidence, in particular, has become a salient problem in the northern part of Jakarta. Takagi et al. (2016) argue that land subsidence has contributed to an 88% increase in the projected affected area in the case of flooding. To combat the effects of land subsidence, the Jakarta government has designed a huge mitigation project called the National Capital Integrated Coastal Development (NCICD). However, the people living on the coast are likely to reject it because the project extends the inundation areas (Saputra et al., 2017). Fig. 4 illustrates how environmental degradation affects densely populated areas, resulting in a low quality of life.

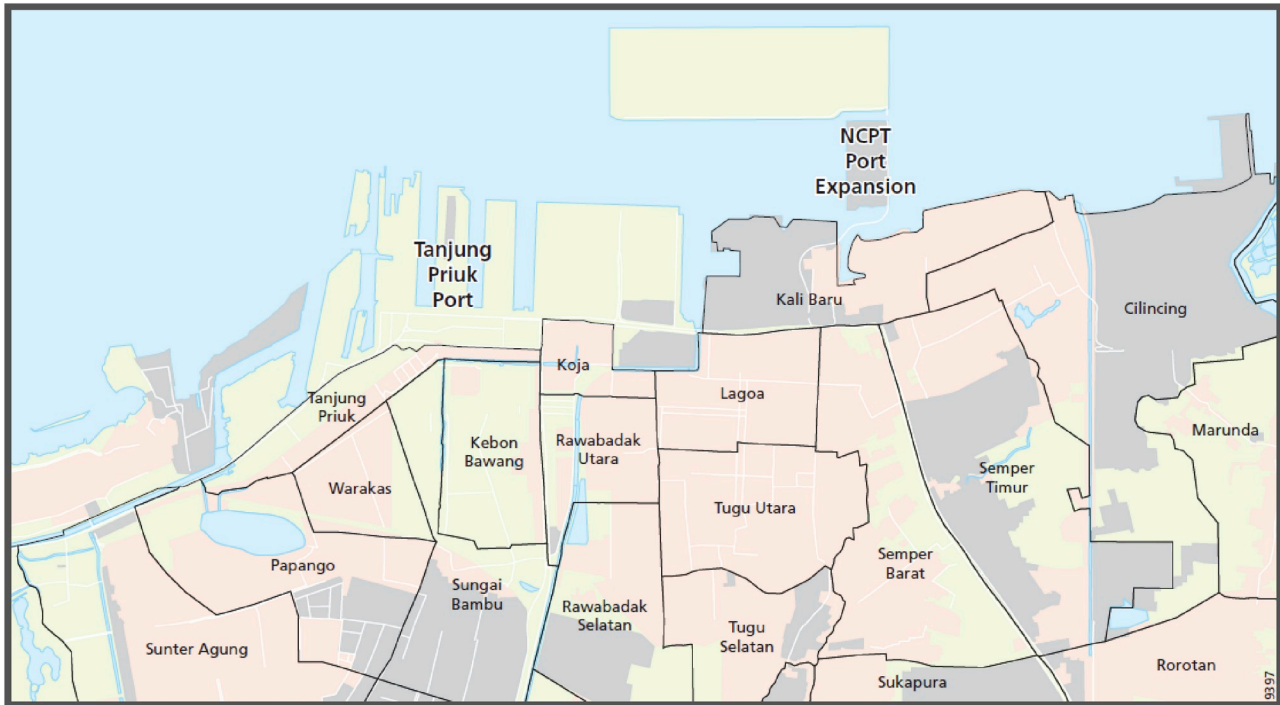


Fig. 3. Study area.

5.2. Understanding fringe: port development and community challenges

Based on the interview with the community leader, the persistent environmental degradation seems to have been worsened by the new port construction. Land development and resource management conflicts occur between the port actors and the local communities, which leads to spatial-economic disintegration within the area. Due to the diverse land-uses and densely populated areas surrounding the port, it is impossible to resettle people in the area. The land reclamation is also

opposed by the affected people. The communities of interest are particularly impacted, as they are highly dependent on the port and the sea, especially in the sub-districts located directly next to the port, such as Kalibaru, Cilincing and Tanjung Priok (Fig. 3).

5.2.1. Community of traditional fishermen

According to Badan Pusat Statistik (BPS; Indonesian Statistics Bureau), there are approximately 6000 traditional fishermen and 1100 people working in the cultivation of green mussels (BPS, 2016). In

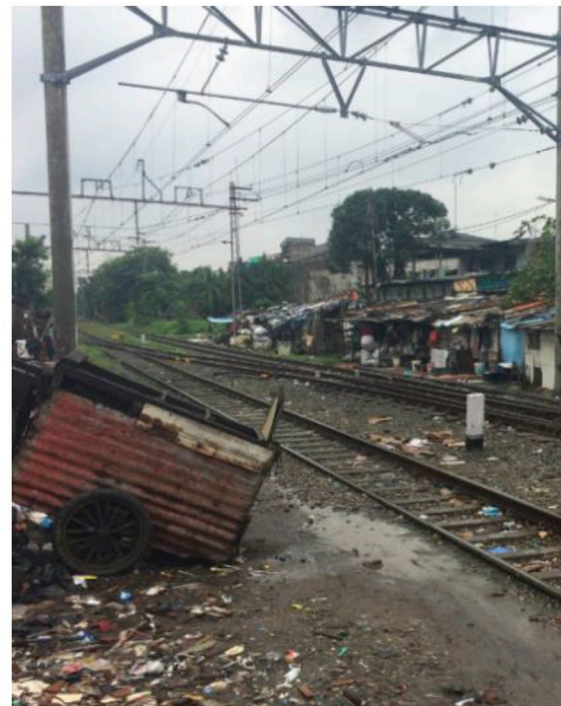


Fig. 4. Left: one of the water intakes in Kalibaru district; right: non-permanent houses along the railway in Tanjung Priok district.



Fig. 5. Fishermen communities in Kalibaru and Cilincing.

2013, the cultivation of green mussels was facilitated by 700 bamboo fishing platforms in the coastal area of the Cilincing sub-district, surrounding the existing port (FAO, 2014; BPS, 2016). These fishermen are defined by the Indonesian Act of Fisheries No.45/2009 as fishermen with small capacity vessels of less than five gross tonnes (Fig. 5). The fishermen mostly live in the sub-districts of Kalibaru and Cilincing. All interviewed fishermen were self-employed and had a daily income of 50,000–100,000 rupiahs (approximately 3.7–7.4 US dollars) and were either boat owners or worked together with other fishermen who owned boats.

#### 5.2.2. Community of seafood processors

We observed many post- and pre-fishing activities, such as the production of salted fish and shrimps, and the transport of fish/

processed fish and ice cubes for fish preservation. People employed in these activities are defined as seafood processor workers (Fig. 6). An interview with a home-scale shrimp processor revealed that shrimp processors can process 200–300 kg of shrimps a day (12.5–19 kg per person); approximately 16 people were employed in the trade. Mussel processors can process up to 10 kg of mussels per day per person, earning a daily income of 30,000–45,000 rupiahs (2.5–3.5 US dollars).

The new port development is having, and will continue to have, various direct impacts on fishermen and seafood processors. The main impact is limited access to fishing grounds, caused by the logistic activities of the existing port. This restricts the continuity and stability of the traditional fishing community's activities (da Costa Oliveira et al., 2016). As a comparison, the development of Coruna Outer Port in Galicia (Spain) created a huge economic loss for fishermen, due to the



Fig. 6. Seafood processor workers.



loss of a productive fishing area (Doldán-García et al., 2011). The development also had significant ecological impacts on the marine ecosystem and natural resources, affecting both the quantity and the quality of fishing. This is also observable in our Indonesian case. The number of traditional fishermen has been decreasing, as mentioned in interviews with the leader of the fishermen community, a community leader and a worker at the fish auction in Cilincing. Seven out of ten fishermen said that it is hard to catch the same amount of fish as they did years ago. They also said that environmental pollution and new fishing regulations are forcing them to find new fishing grounds further away from the shore. However, this is impractical, since 95% of the fishermen's equipment is small scale (FAO, 2014) and their boats are not suitable for fishing far out to sea. As a result, their livelihoods might be endangered.

### 5.2.3. Community of port workers

Another community is that of the port workers. This is a common occupation in the sub-districts of Tanjung Priok and Kota. A port worker can earn approximately 120,000–180,000 rupiahs (9–13.5 US dollars) per day. Although one might think that these workers would benefit the most from the port development because the expansion will generate more loading activities, the reconfiguration of modern equipment and facilities in the port reverses the situation. The primary concern of the workers is that they do not have the skills to keep up with the automatization and advanced port technologies, as mentioned in the informal focus group discussions and interviews. Changing work patterns might jeopardize the livelihoods of low-skilled port workers. Moreover, the workers do not have permanent contracts, which means that job uncertainty is commonplace. Technological improvements in loading and unloading activities (Fig. 7) bring new risks and make ports a dangerous working environment, thus education and training for port workers is necessary (Hinka et al., 2016).

### 5.2.4. Other communities

Other occupations both observed and mentioned by BPS (2016) are workers in trade, restaurants, accommodation, transport, storage, communication, manufacturing and community services. The existence of a port can attract various types of industries to a city (Zhao et al., 2017), leading to the port having broader economic attractions regarding new job creation generated by these industries. In the Jakarta metropolitan area, the minimum daily wage for this type of work is approximately 160,000 rupiahs (12 US dollars). Interviews with community leaders in the surrounding neighbourhoods showed that the low educational level of the residents is perceived as a problem. The port and surrounding industries offer only a limited number of low-skill jobs, whereas the supply of low-skilled labour is large. This is in line with Wiegmans et al. (2015), who show that there is no relationship between the number of jobs in a region and the presence of transshipment growth, and that the relationship between regional employment and

transshipment levels is insignificant. If any, based on OECD report (2013), the local employment created by port industries is relatively marginal compared to the wider regional economy mainly due to the fact that employment is a result of backward and forward linkages of port development (see Merk, 2013).

Moreover, regarding the community of place, respondents living in Tanjung Priok and Kalibaru mentioned a low quality of life related to unemployment, violence, and drug and alcohol abuse. Community leaders and residents in these areas also raised this issue. One of the community leaders in Tanjung Priok explained that there used to be garment factories in the area and that they employed many unskilled workers. However, the factories closed in 2015 due to changed land-use for the port extensions. Automatization of the port activities has also contributed to the loss of jobs in these areas. Some community leaders underlined that high unemployment rates possibly lead to increased drug use, violence and criminality in those neighbourhoods.

### 5.3. Dealing with change: indirect impacts of port development

Gallent et al.'s (2006) 'seeking changes' scenario highlights innovative ways of dealing with planning on the edge. Since the Jakarta port-city interface has limited land to be used for port expansion, the development will take place on reclaimed areas along the shoreline (see Fig. 8).

The effects of port expansion through reclamation are twofold. First, regarding positive impacts, the project will contribute to meeting the high demand for port facilities and to a growing economic and maritime industry (Jayanthi and Damayanti, 2015). Doubling the port capacity will impact Jakarta's transport services industry, which is expected to see a 20% capital increase between 2016 and 2020. It is also predicted that improvements in port efficiency through expansion and related reduction in port turnaround time might contribute to a 4% increase in Jakarta's GDP and a 1.1% increase in the nation's GDP (Ginting et al., 2015). Second, regarding negative impacts, based on our observation and evaluation, the communities identified in the previous section will be negatively affected by the port development. Potentially, there are at least two indirect effects on the local communities, namely loss of livelihood and the relocation of residents and industries.

#### 5.3.1. Loss of livelihood

Although based on the Ministry of Transportation's Regulation No.38/2012, the land reclamation for port development is supposed to be outside the fishing grounds of the local communities, in many cases reclamation might have negative impacts on the environment, such as loss of marine habitats and water quality degradation, that can affect coastal ecological systems (Jin et al., 2016; Zhu et al., 2016). The coastal reclamation has also forced the fishermen to find other fishing grounds (Saleh et al., 2016).

The interviewed fishermen see this effect as a perceived challenge,

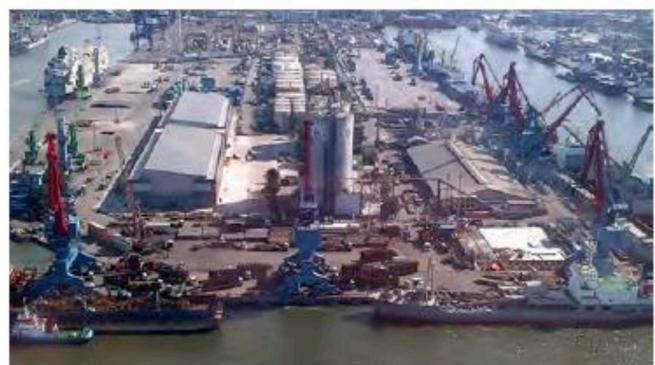


Fig. 7. The automatization of port facilities Source: IPC Port Developer (2015)..



Fig. 8. Master plan of new Priok terminal Source (2015).  
Source: IPC Port Developer (2015)

and their fear of losing their livelihood is very real, because they do not have any skills other than fishing. As the development of NPCT is located in the northern part of Tanjung Priok and Kalibaru sub-districts, fishing grounds and mussel cultivating areas in this area might disappear. One of the community leaders in the Kalibaru sub-district also said that the number of fishermen in his area is decreasing due to the development of a new dike along the seashore. A leader of the fishermen community also emphasized that most fishermen object to the reclamation. They will lose their livelihoods if they are resettled far from the coast.

The fish auction could therefore also see a decrease in trade. During the interviews, one of the workers said that the fishing ponds of small-scale fishermen are negatively affected by the port development. Despite the fishermen's protests, the income in the fishermen community had decreased by 50–60%. As supply is decreasing, this will trigger a decline in fish processing activities in the area, along with supporting activities like logistics for ice blocks, food for fishermen and fish production. As a result, a great number of local workers are at risk of losing their livelihoods and incomes.

### 5.3.2. Relocation of residents and industries

The port expansion is accompanied by the development of a functional infrastructure network into its hinterland. Based on the [Ministry of Transportation's Regulation No.38/2012](#), a significant number of households will be resettled to make way for the new main access routes to the port. This will also change the land use in the surrounding areas. In the long run, resettlement due to megaproject development tends to create social divisions and disempowerment, as well as a re-configuration of power relations in the local context ([Jordhus-Lier, 2015](#)). The interviews with residents living in the river embankment area showed that resettlement was causing them fear and anxiety. If they have to move, it will significantly increase travel time to their current working place. This can cause a loss of livelihoods, especially when the skills they have do not match the employment opportunities at the new location. The vast majority of the interviewed seafood processor workers, fishermen, transport boat workers and port workers emphasized that they do not have other skills besides their existing jobs.

### 5.3.3. Implications for local spatial planning

To take these diverging local and regional factors into account, we observed opportunities for local inclusion as a planning strategy. Community empowerment and the embedding of local knowledge can be useful for urban adaptation planning in Jakarta ([Simarmata, 2017](#)). From the interviews with all community leaders, we found that *Musrembang* (*Musyawarah Perencanaan Pembangunan*) – a local discussion forum about planning and development – is perceived as useful for giving the district-level authorities local contextual input for their

regional development plans. This forum is also used to inform residents about forthcoming projects and acts as a venue for local people to communicate their concerns to the relevant authorities.

Here we observe another parallel with the fringe literature ([Gallent et al., 2006](#)), namely the necessity to underline local visions that offer realistic solutions derived from an understanding of the local contexts and needs. From this, we conclude that the port-city interface could benefit from more inclusive plans with a participatory approach that brings local stakeholders together to ensure that 'place making' processes are in line with various aspirations and agendas. A forum like *Musrembang* is in line with this, because the discussions are usually attended by community leaders, residents, district-level authorities and other related agencies who understand their localities to achieve shared-benefits.

## 6. Discussion and conclusion

In most academic literature on port studies, there is a missing link between port development and its implications for the external environment ([Ng et al., 2014](#)). The literature has so far barely looked at the interests of local communities. The present research therefore studied the impacts of port expansion on local port communities in the case of Jakarta, Indonesia. Based on rural-urban fringe experiences, we identified and analysed the impacts of port development on the surrounding area of conflicting interests (i.e. the port-city interface) in a more holistic way. The most important insight is that the communities' livelihoods are highly dependent on the blurry boundaries between port and city. This makes the communities living on the edge the most vulnerable actors in the port-city interface.

Unlike the case of a rural-urban fringe, in which people move freely to the fringe area to escape the disturbances of the urbanized world ([Pryor, 1968](#)), the communities living on the edge of a port-city interface are bound to the area because their livelihoods depend on it. With the trend of port regionalization ([Notteboom and Rodrigue, 2005](#)), there are continuous spatial developments related to the port activities taking place in the port-city interface. Our findings are generally in line with this phenomenon in other developing countries, in which port development also has to catch up with the demands of economic growth (e.g. [Ng and Tongzon, 2010](#)). As a result, both the community of interest and the community of place ([Thomsen et al., 2009](#)) are at risk of social disruption caused by planning interventions in the interface area, especially if their livelihood dependency is overlooked. Our findings also confirm the work of [Witte et al. \(2017\)](#) in the context of mature economies, stating that proximity to the main port does not guarantee that the growth benefits trickle down in the direct hinterland. Significant attempts to underline the negative implications of the development have to be prioritized on the agenda as a counter

consideration of economic benefits of such a large project (Huang et al., 2011).

Such efforts could start by acknowledging these communities along with their concerns, fears and local realities. Doing this will enable policymakers to map the actual impacts of new port development on society. In this, the use of assessment tools such as Cost-Benefit Analysis have a long history. However, there are institutional shortcomings attached on the practices of impact assessment (Revesz, 2017). Especially when taking social effects into consideration, for instance by means of Social Cost Benefit Analysis, our findings are relevant to bringing back the communities into the assessment tools and finding space for mapping their concerns, fears and anxiety as impacts of certain developments, in our case, port expansion. In particular, the demand for more transparency and real partnership between the city administration, private sector and citizens is persistent in the case of Jakarta (Steinberg, 2007).

Besides mapping the impacts, identifying the communities in the port–city interface is also crucial for the delivery of shared benefits derived from the new port development to the locals. The expansion of a port provides the city with economic advantages in the form of forward linkage effects (e.g. freight support for primary and secondary economic activities) (Chang et al., 2014). Through acknowledging communities' livelihoods, there is a possibility to optimize the economic advantages for the people living in the vicinity of the project. As the empirical findings show, the communities of interest in the area perform informal and small-scale economic activities, such as fish supply and seafood processing. Policy tactics, for instance in the form of appropriate mitigation strategies, could transform these activities into shared economic benefits. Policymakers, for example, could provide the opportunity to uplift people's skills to compensate for the loss of livelihood as a result of displacement and resettlement. As the interviews revealed, most of the participants do not have alternative skills.

The findings of this research might inspire a reconsideration of the agenda of port development, to take into account the broader indirect impacts of port expansion on the local communities. When the local reality of port communities is better represented in impact assessment analyses, it is expected that bridging the gap between pro-growth and pro poor (Sutherland et al., 2015) will become more than just a 'fairy tale' on paper. These communities have their own perceived reality in making sense of the dynamics in the port–city interface. For further research, we therefore argue that there is a possibility of looking at the perception making on megaprojects capturing the perceived local realities.

Perception making is also related to the power struggles taking place between communities and other actors and entities in the port-city interface. Thus, we also recommend to explore port communities in the context of other subfields of port research as categorized by Pallis et al. (2010), such as ports in transport and supply chains and port competition and competitiveness, in which supply chains, logistic activities and shipping networks as well as port choice have significant implications to the local communities living in or near the port. Also, we suggest to look at different case studies in other developing countries to see whether our specific findings about the challenges of communities living on the edge of the port and the city are struggles that are experienced by port communities across the globe.

#### Declaration of interest

None.

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