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Floods in (post-) New Order Jakarta

A political ecology of urbanization

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2

EXPLANATORY FRAMEWORK AND METHOD¹⁰

2.1 EXPLANATORY FRAMEWORK: POLITICAL ECOLOGY OF URBANIZATION

2.1.1 How to make sense of urbanization as consisting of sociospatial and socionatural moments that produce unevenness?

In the previous chapter, I identified the three main premises of my attempt to understand the relations between urbanization and floods – both flooding events as well as infrastructure developments aimed at flood protection and management – in Jakarta. The first premise is that flooding is not bound by city boundaries, but needs to be inserted in an analysis of beyond-the-city processes. I refer to this as the more-than-city or sociospatial moment. Secondly, flooding is intimately related to two other ecological

¹⁰ Some parts of this chapter have been published in different forms, (1) as a theoretical chapter in Batubara, B., Kausan, B.Y., Handriana, E., Salam, S. and Ma'rufah, U. (2021). *Banjir Sudah Naik Seleher: Ekologi Politis Urbanisasi DAS-DAS di Semarang (Water is in My Neck: Political Ecology of Urbanization in Semarang Watersheds)*. Semarang: Cipta Prima Nusantara; (2) Batubara, B. (2021). Swyngedouw's Puzzle: Surplus-value Production in Socionature. *Human Geography*, 14(2): 292-5. Some parts of it have also provided the basis for the writing of (3) Batubara, B. (2019). Krisis, Ketidakadilan, dan Keadilan Sosial-Ekologis [Socio-ecological Crises and (In)justice]. *Prisma*, 38(3): 66-84; (4) Batubara, B. and Handriana, E. (2021). Dari Krisis Sosial-ekologis ke Ekologi Sosial: Kasus Semarang Suburbia (From Socio-ecological Crises to Social Ecology: Semarang Suburb). *Prisma*, 40(3): 30-46; (5) Batubara B, Kooy, M. and Ardhanie, N. (under review, 28/10/2021). Maleh dadi Segoro: Contesting Pro-growth Urbanization and Experimentation of Degrowth through Water Metabolism in Semarang, Indonesia. Part of a Special Issue entitled "Urbanizing Degrowth: Towards a Radical Spatial Degrowth Agenda for Future Cities," edited by Maria Kaika, Angelos Varvarousis, Hug Marc, and Federico Demaria, submitted to Urban Studies; and (6) Batubara, B. (submitted) Political Ecology of Urbanization. *Human Geography*.

changes: the depletion of groundwater and land subsidence. Both are provoked by societal or human actions, which is why flooding needs to be understood as part of wider socio-natural processes of urbanization. I refer to this second premise as the more-than-human or socio-natural moment. The third premise relates to the underlying aim of this research; I am seeking for ways to change or to eliminate the unevenness of urbanization. In my view, this asks for an understanding of the capitalist processes that I hold responsible for producing unevenness. I refer to the third premise as the moment of unevenness. The objective of this part is to explore and discuss ways to theoretically acknowledge and make sense of urbanization as simultaneously comprising a socio-spatial and socio-natural moment, all the while not losing sight of the moment of unevenness. I start this theoretical exploration by revisiting an important source of inspiration to explaining the persistence of Jakarta's floods: Blaikie and Brookfield's (1987) political ecological approach.

Political ecology (PE) debuted in the near-South countryside as a political economic approach to re-politicize (or expose and confront the unevenness of) environmental transformations – soil degradation and ecological deterioration (Blaikie, 1985; Blaikie and Brookfield, 1987: 17; Bryant and Bailey, 1997; Robbins, 2012; Bridge et al., 2015).

The further development of political ecology as an explanatory framework for environmental transformations has benefited from socio-spatial/geographical theories of scale, region, and landscape (Neumann, 2009; 2010; 2011) and society-nature relations (Neumann, 2009 and 2010; Turner, 2014; Bridge et al., 2015; Loftus, 2020). Recent critiques of political ecology have usefully exposed how a distinct form of unevenness is also intrinsic to its own scholarship, as most of its theoreticians are white men (Sultana, 2021). The “urban graft” (Robbins, 2012: 72) urbanized PE into urban political ecology (UPE), a theoretical apparatus to explain the production of uneven urban socio-nature (Swyngedouw, 1996). Hence, from an explanatory framework for rural or countryside environmental changes, PE was adapted and transformed to also allow analyzing urbanization. UPE scholars kept the mission of wanting to confront unevenness, or “privilege and exclusion” and “participation and marginality,” (Swyngedouw, 1996: 65) in environmental transformations (Keil, 2005; Heynen, Kaika, and Swyngedouw, 2006; Swyngedouw and Kaika, 2015). A “fruitful engagement among scholars” (Tzaninis et al., 2020: 5) led to the enrichment of UPE with Marxist and actor network (ANT) methods and theories (Heynen, 2014). Marxist views helped UPE better recognize and grapple with the power of social structures (examples: class, capitalist, labour) in socioecological changes, while ANT approaches helped UPE to analyze socioecological changes as an “unstructured agglomeration of networks” (Lave 2015: 218). UPE also benefited from the embodied/situated analyses of race ecology (Heynen, 2015) and feminist and queer texts (Heynen, 2017).

The explosion of socio-spatial theories of urbanization around the planetary urbanization (PU) thesis (see the volume edited by Brenner [2014]) brought a much-needed critique of

“methodological cityism” (Angelo and Wachsmuth, 2015). This critique had it that UPE puts too much analytical attention to urbanization processes within the city, to the neglect of the non-city. This is in-line with Brenner and Schmid’s (2015) call for a “new epistemology of the urban” to do away with the understanding of the city through the “urban age” thesis (Brenner and Schmid, 2014), which privileges the city rather than urbanization. Angelo and Wachsmuth’s (2015) suggestion was to move from Urban Political Ecology to a political ecology of urbanization (PEU), to link socionatural moments with sociospatial moments when theorizing urbanization.

For my purpose – to understand urbanization as comprising of sociospatial, socionatural, and unevenness moments –, Angelo and Wachsmuth’s (2015) work is helpful. I feel that processes out of which the current city of Jakarta and its floodings are produced are better captured with the term of ‘urbanization’ than by merely calling them ‘urban’. This is why – even though Angelo and Wachsmuth’s (2015) critique of methodological cityism has been challenged by Connolly (2018) through an elaboration of UPE scholarship moving beyond analyzing the city and paying more attention to the process of urbanization – I choose to borrow the term “political ecology of urbanization” (PEU) from Angelo and Wachsmuth (2015), and use it as the title for this part, even making it the sub-title of this thesis. In fact, Swyngedouw (1997) already used the term “political ecology of urbanization” almost two decades before Angelo and Wachsmuth (2015). The pragmatic task for me here then is not to further spell out the differences between UPE and PEU, but to see how these two groups of scholarship discuss the three moments that I am interested in: unevenness, sociospatiality, and socionature. Table 2-1 below displays some excerpts of how moments of unevenness, sociospatiality, and socionature are depicted by Heynen, Kaika, and Swyngedouw (2006), who declared UPE’s manifesto, and Swyngedouw’s (1997) PEU.

Table 2-1: Excerpts to show how the three moments are depicted in UPE and PEU texts. Compiled by author from Heynen, Kaika, and Swyngedouw (2006) and Swyngedouw (1997).

Moment	Heynen, Kaika, and Swyngedouw (2006)	Swyngedouw (1997)
Unevenness	“urban political ecology asks questions about who produces what kind of socio-ecological configurations for whom” (page/p. 2).	“political ecology of urbanization takes place through deeply exclusive and marginalizing processes that structure relations of access to and exclusion from access to nature’s water” (p. 311).
Sociospatial	“urban socio-ecological conditions are intimately related	“the urbanization of water and the capital required to build and expand

Moment	Heynen, Kaika, and Swyngedouw (2006)	Swyngedouw (1997)
	to the socio-ecological processes that operate over a much larger, often global, space” (p. 7).	the urban landscape itself are dependent on the political and ecological transformation of both the city and countryside” (p. 312).
Socionatural	“Nature and humans are simultaneously historical, material and cultural” (p. 7).	“the political, social, and economic can not be separated from the ecological in understanding the urbanization process” (p. 312).

To engage with capitalist development in (post-) New Order Indonesia and to sustain the tradition of PE and UPE of confronting the unevenness in the production of the environment, the next three sections of this chapter equips my operationalization of PEU through Marxist political economic thoughts. I do this by exploring the constitutive moments of unevenness, sociospatiality, and society-nature. This part does not aim to review all of the discussion of UPE/PEU’s contemporary development, this is a speculative exercise to construct for myself a theoretical background for the independent but connected articles in the coming chapters. The end section locates how the rest of thesis should be seen/read in the light of this theoretical conversation.

2.1.2 Moment of unevenness

The moment of unevenness has been the subject of Marx (Marx and Engels, 1848[2008]; Marx, 1867[1982]) and Marxists (Trotsky, 1930; Smith, 1984[2008]; and Harvey, 2004; 2005) scrutinization. As part of these literatures, Neil Smith’s works deserve particular attention for his intervention through ‘the theory of the production of geographical scale’ that makes the conversation between all of them even more logical.

Capitalist urbanization always proceeds unevenly (uneven development). "The seed of uneven and combined development" (Goonewardena, 2014: 222) theory can be found in Marx and Engels (1848[2008]) through their exploration of city-countryside relations and colonialism. In Capital I, Marx (1867[1982]: 472) explains in capitalism, "the separation of town from country" is the foundation of the social division of labour. It shapes and is shaped by a certain kind of development, i.e. capitalist development that is mediated by the wage-labour exploitation by capitalist and by the commodity exchange. The former is a socionatural metabolism – processes through which the labours alter the non-human nature. The latter is the social metabolism. He ended Capital I with a discussion about modern colonialization in which the colonizer has to implement systematic colonialization through primitive accumulation by dispossessing the colony’s population

from their land and transforming them into wage-labour. In other words, it is an act of transforming or absorbing the colony into the larger capitalist mode of production. The colony then is produced to fulfil the needs of the colonizer. The capitalist-labour, city-country, and colonizer-colony relations are the uneven expressions of a distinct capitalist mode of production.

Trotsky (1930) coined the law of uneven and combined development as a combination of the law of unevenness and the law of combined development in the historical development of a nation. Unevenness, according to Trotsky, is the general character of a historical process, and it is most visible in backward countries such as Russia, measured in terms of capitalist development. Geographically, Russia is located between Western Europe and Asia. On the one hand, military, manufacturing, and business, in short, capitalist development, in Western Europe around the eighteenth century compelled Russia to follow that path; while on the flip side, the slowness of capitalist development in Asia was also affecting Russia's development. The development of Russian agriculture, for example, is affected by Western European modernization and, equally, by the nomadic character/tradition of Asia. Unlike Western Europe, where capitalist development in the form of industrialization created spatially concentrated populations in a particular geographical area, the transformation of population into a proletariat and of geographical spaces into concentration of capital was hindered by the nomadic tradition of the Russian population. The unevenness in Russian history then is characterized by this combination: the move toward intensive development of capitalism and its formlessness. The law of uneven and combined development means, in Trotsky's (1930: 37) own words: "a peculiar mixture of backward elements with the most modern factors" of capitalist development.

Smith (1984[2008]) uses the term "uneven" to build the theory of "uneven development." For Smith (1984[2008]) uneven development is a manifestation of how capital accumulation proceeds through the production of nature/space under capitalism, involving mutually implicative tendencies of differentiation and equalization across geographical scale. For Smith, the capitalist mode of production always proceeds by producing unevenness. This can be understood by looking at its internal contradiction. Uneven development works with the laws of concentration and of centralization for the endless round of capital accumulation. The law of concentration works by spatially concentrating labour, means of production, and money-capital in a particular geographical area. The law of centralization works by centralizing use-value in the hands of ever fewer capitalists.¹¹ An example is the centralization of land ownership in the hands

¹¹ According to Marx (1867[1982]) use-value means the use of a thing. For example, a table is useful as a place for dinner or for typing (like mine now). Exchange-value is the capability of a thing to be exchanged in a standardized way of expression. For example, the exchange-value of a table is the price of a table in the market. Surplus-value is the objectification of the surplus-labour time in commodities, to be

of fewer capitalists. Both the laws of concentration and centralization work dynamically for the accumulation of capital. The latter means a mechanism through which part of the surplus-value is invested for the next round of production. The internal contradiction of uneven development of capitalism is that the capital accumulation in one pole means the lack of it at the other. This is the chronic face of capitalist uneven development according to Smith (2008[1984]).

Harvey (2004; 2005) uses the term "uneven" in the theory of "uneven geographical development." He explains unevenness in terms of the divergence of well-being, geographical and social disparities, and the uneven distribution of environmental degradation and social dislocations. He depicts uneven geographical development through his theory of "accumulation by dispossession/AbD," a rejoinder to highlight that Marx's primitive accumulation is happening (and expanding) nowadays under new imperialism (Harvey, 2003 and 2004) and neoliberalism (Harvey, 2005). In his own words, AbD is "crucial to the interpretation of neoliberal capitalism and contemporary forms of imperialism" (Harvey, 1982[2006]: xvii). There are, according to Harvey, three elements of AbD: iron laws, features, and mechanisms. Iron law dictates features that create the condition of possibilities for mechanisms to grow (see Table 2-2).

Table 2-2: Harvey's theory of AbD (adapted from Batubara, 2019).

Iron law (Harvey 2003: 153)	Features (Harvey 2005: 160-165)	Examples of mechanism (Harvey 2003: 146-148)
"to prey upon law-income families and bilk them of whatever little savings they have."	<ol style="list-style-type: none"> 1. Privatization and commodification 2. Financialization 3. The management and manipulation of crises 4. State redistribution to the upper class. 	<ol style="list-style-type: none"> 1. Producing class relations (proletarianization) 2. Suppressing alternative mode of production and consumption 3. Privatization of national assets 4. Slavery (particularly in sex trade) 5. Stock promotions 6. Ponzi scheme 7. Structured asset destruction through inflation 8. Asset-stripping through mergers and acquisition

sold/realized in money-form. In a factory, surplus-value is exploited by the capitalist from wage-labour through the production process. An example of commodity is a table in market. Thus, a table available for sale in the market embodies all three: the use-, exchange-, and surplus-value.

Iron law (Harvey 2003: 153)	Features (Harvey 2005: 160-165)	Examples of mechanism (Harvey 2003: 146-148)
		9. Corporate fraud 10. Patenting and licensing of genetic material 11. Biopiracy 12. Proliferating habitat degradations 13. Commodification of cultural forms.

For its strong and systematic assessment of uneven development, Neil Smith's works deserve special attention. What makes Smith's (1984[2008]) uneven development different, in my view, is his intervention through geographical scale which helps to reconstruct and make sense of a conversation between the multiple scales of unevenness. Smith's "theory of the production of geographical scale" appeared first as "spatial scale" in *Uneven Development* (Smith, 1984[2008]: 175-205), where it was called "the theory of the production of geographical scale" in Smith (1992: 72). Smith (1993) identified many levels of socially constructed scales: the body, home, community, urban, region, nation, and global. He subsequently detailed into urban (Smith, 1996), national (Smith, 1995; 2004), and global (Smith, 2005) scales. For Smith, therefore, the theory of the production of geographical scale is not only among his "lifelong contributions" (Jones et al., 2016: 138), but also a theory that guided his intellectual works. Under the uneven development of capitalism, geographical scale is the "organization" (Smith, 1984[2008]: 181) as well as the "outcome" (Jones et al., 2016: 2) of the processes. According to Smith (1984[2008]), the most primary set of scales typical to the uneven development of capitalism are: urban, nation-state, and global. Capitalism was nurtured within and through this set of geographical scales. The urban scale was inherited by capital from the pre-capitalist town – as a product of spatial differentiation between town and countryside, as the site of concentration of labour and means of production, and as the site of the centralization of use-value ownership in the hands of ever fewer capitalists –, and it reached its fullness under uneven capitalist development. The scale of the nation-state, more political but not less economic, is a product of capital's differentiation in the sense that the internationalization of capital is also simultaneously its nationalization. That is why I, for instance, have the expansion of USA-based capital and Australian-based gold mining in Chapter 1. The global scale is a product of the tendency of equalization in uneven development, in which things from DNA all the way to the planetary earth and beyond are equalized into commodities.

Smith's theory of 'the production of geographical scale' helps me to explain how Marx and Engels's (1848[2008]) and Marx's (1867[1982]) town and countryside asymmetric

relations proceeds through primitive accumulation and Trotsky’s (1930) combined development as ways of expressing the unevenness within the nation-state. The same theory helps me to understand Marx and Engels’ (1848[2008]) and Marx’s (1867[1982]) colonialism and Harvey’s (2003; 2004; 2005) analysis of imperialism and neoliberalism as ways of expressing unevenness under capitalist development at the global scale (mainly relations between nation-states). The exploitation of wage-labour by capitalists can move within and pass through the city and the nation-state. The latter is through global “global value chain” (Suwandi, 2019) through which people at the near-South countries are exploited to fulfill the demands from the people of developed countries. Table 2-3 summarizes how they depict unevenness under capitalism.

Table 2-3: Unevenness under capitalism, made by author.

Unevenness under capitalism	Marx and Engels (1848[2008]) and Marx (1867[1982])	Trotsky (1930)	Smith (1984[2008])	Harvey (2004; 2005)
Theory	Capital	Uneven and combined development	Uneven development	Uneven geographical development
Key insights	<ul style="list-style-type: none"> • Capitalist-labour contradiction • Uneven town and country relationship • Colonialism 	<ul style="list-style-type: none"> • Unevenness as general character of history • Rapid and slowness of capitalist development 	<ul style="list-style-type: none"> • Production of nature/space • Dialectics of differentiation/equalization • Geographical scale 	<ul style="list-style-type: none"> • Well-being • Environmental degradations • Social dislocations • New imperialism • Neoliberalism.

2.1.3 Sociospatial moment

The sociospatial moment is central in Marxist theories of urbanization. Brenner and Schmid (2015) identified that the established understanding of the urban sees it as no more than a bounded space. According to them, this way of understanding the urban is far from enough, because urban processes are not halted or bounded by city boundaries. They proposed a different way to understand the urban. Rather than defining a city as a fixed spatial container, they propose focusing on the capitalist urbanization processes that

produce a city. City and non-city are then linked through various connections such as flows of water, labour, and money-capital.

This extended understanding of the urban is one of the components of Brenner and Schmid's (2015) "epistemology of the urban" in which they propose to understand urbanization through three mutually constitutive moments of concentrated, extended, and differential urbanization. Concentrated urbanization is a moment of city's growth to form a sociospatial concentration. Extended urbanization differently shows how the city grows far beyond its administrative boundaries and operationalizes the non-city regions (for the advancement of "extended urbanization" theory see for instance: Castriota and Tonucci [2018]; Keil [2018]; Ghosh and Meer [2021]). The moment of differential urbanization is a moment of creating sociospatial unevenness, in which both the city and non-city are "creatively destroyed" and "radically remade" (Brenner and Schmid, 2015: 168) as part of the crisis tendency of urbanization processes.

I see Brenner and Schmid's (2015) epistemology of sociospatial dynamics above as inspired by, anchored in, or resonating with, the work of Lefebvre (2000 and 2003), and Marx and Engels (1848[2008]).

For Lefebvre (2000: 65-85), the conquering of the city by industrialization produces urban crises (he called it "*urban problematique*") through double processes of implosion-explosion.¹² Along with the industrialization process, according to Lefebvre (2000: 65-85), capitalism furthered the transformation of the city from an artistic product, the *oeuvre*, into an industrial city; from one that was dictated by the use-value, to one that is dictated by exchange- and surplus-value. Therefore, Lefebvre's *oeuvre* not only marks the notion of everyday life as 'a work of art' and 'the city as a creative product,' but also the condition of the un-commodified city dictated by use-value. In the process of shifting from *oeuvre* to the industrial city, the worldview of the bourgeois conquers the *oeuvre*, replacing the existing social relations (the role of use-value, strong ties of communality, the appreciation of artworks) with the new progressive bourgeoisie set of ideas (economic/capital growth, instruments to foster economic growth, and the role of surplus- and exchange-value), and replacing its people such as writers and painters with

¹² Lefebvre (2000) does not clearly explain what he means by "industrialization." I relate this to Marx (1885[1978]: 109-179) who conceives "industrial capital" as capital valorization that involves the circulation of money-, productive-, and commodity-capital. Money becomes capital when it is invested in capitalist production, to buy/provide means of production (energy, machinery, raw materials) and to pay wage-labour. If you hoard money in your home, this money is not industrial money-capital. Productive capital is all the money that is consumed by production processes, for example, all the money to buy means of production and to pay wage-labour. Commodity becomes capital when it is sold to realize it into money form. Following Marx's explanation of industrial capital, industrialization can then be understood as a process of creating a condition through which industrial capital unfolds/valorizes.

entrepreneurs/capitalists. Implosion is characterized by "tremendous concentration (of people, activities, wealth, goods, objects, instruments, means, and thought) of urban reality," while explosion is characterized by "projection of numerous, disjunct fragments (peripheries, suburbs, vacation home, satellite towns)" (Lefebvre, 2003: 14).

Marx and Engels (1848[2008]: 39-42) analyzed how the countryside was subjected to the rule of the town. Under capitalist development, the countryside is treated as an operational space to mainly fulfill the needs of the town in terms of the supply of labour power and of raw materials. With the domination of the bourgeoisie, capitalist development has produced the town, which has an "agglomerated population," "centralised means of production," and "concentrated property in a few hands" (Marx and Engels, 1848[2008]: 40). The agglomeration eventually ended up in the capitalist crisis of overproduction simply because now in the town there is "too much civilisation, too much means of subsistence, too much industry, [and] too much commerce" (Marx and Engels, 1848[2008]: 42). Table 2-4 summarizes the dimension of sociospatial dynamics of urbanization.

Table 2-4: Sociospatial dynamics of urbanization, made by author.

Dimension of sociospatial dynamics of urbanization	Marx and Engels (1848[2008])	Lefebvre (2000 and 2003)	Brenner and Schmid (2015)
Concentration	Town	Implosion	Concentrated urbanization
Expansion	Country under the rule of town	Explosion	Extended urbanization
Crisis	Overproduction	<i>Urban problematique</i> of industrial city	Differential urbanization.

2.1.4 Society-nature moment

The main thesis of the Marxist society-nature relation is that society (human) and nature (non-human) are entangled in capitalist production. UPE/PEU scholar, Erik Swyngedouw (1996), introduced the term "socio-nature" to coin this oneness. One of his main inspirations is Haraway's (1991: 1) cyborg, a mix of machine and organism. Most likely Swyngedouw's (1996) term "socio-nature" was also inspired by Marx's (1867[1982]: 164-5) "socio-natural," which explains how wage-labour's product, the commodity, "reflects the social characteristics of men's own labour." Swyngedouw (1996) shows how a

modern city like New York is not an antipode of so-called nature. A city is a hybridized form of the social and the natural, a socionature.

Swyngedouw (1996) theorizes socionature through an engagement with Marx's conception of "metabolism." His main aim is to build a foundation in which nature and social interpenetrate through metabolic processes. He equipped his work with Smith's (1984[2008]) "production of nature" to explain how nature is a historical-geographical process, produced under capitalism. Marx's conception of metabolism, in Swyngedouw's (1996) reading, had the ambition of criticizing the bourgeois notion that treated non-human nature as external to human nature, and allowed the human to dominate non-human nature. However, Swyngedouw's explanation problematizes a Marxist approach such as Smith's production of nature, because of how it is at risk of being trapped in a labour-centred analysis, and, therefore, of perpetuating the bourgeois ideology that treats the non-human as external to the human, and humans as being external to the non-human. Smith's production of nature, according to Swyngedouw (1996: 69), embodies:

"an interesting paradox. Insisting on the "social production of nature" suggests the "determination in the last instance" of social relations in the production process, hence may easily fall back into the trap of subsuming processes-in-nature under the umbrella of an exclusively socially produced and controlled nature".

Swyngedouw (1996) advocates for the development of a new term/concept/language to go beyond the social and natural binary. With the concept of metabolism in the centre, he explores the hybridization process of nature and the social, and the transformation of cultural practice through language into the formulation of how practice is represented, in which the hybridization process is explained. He explains the hybridization processes through combined material exchanges, or socionatural metabolism, of biochemical and social relations. For him, the urbanization of water or city are examples of socionatural production, involving myriad steps of socio-ecological processes, diffusing the local and the global, through weaves of network. Swyngedouw (1996: 70) argues that "political ecology" is a theoretical apparatus to capture the "process of the production of networks," and "socio-nature" is the language/word "to refer to the product, the hybrid".

Following Swyngedouw, the concept of socionature has been widely used. It is not the intention of this part to survey where, how, and through whom the idea/concept of socionature has travelled. By early 2021, *Google Scholar* showed that Swyngedouw (1996) has been cited 530 times. I will however mention a few citations here as examples relevant for my own use of the concept. Gellert (2005) sets the sociological and ontological foundation for socionature by building a dialogue between actor network theory and unequal ecological exchange, to show, among other things, the role of the non-human in the unequal ecological exchange between the world's core and the periphery. Angelo and Wachsmuth (2015) use socionature to explain the socio-ecological process in

the metabolism of urbanization. Ranganathan (2015: 1301) uses the term *socionatural* relations to explain the production of flood-prone condition as a "risky urban *socionature*" (Ranganathan, 2015: 1301) in Bangalore's wetland.

In this thesis, I am working with the non-human (flooding, groundwater) in uneven capitalist development through urbanization. Swyngedouw's (1996) *socionature*, powerful and useful as it is, does not explore the role of the non-human in the capitalist production of surplus-value in comparison with that of wage-labour. His focus was the metabolism of the social and the natural. The subsequent ten-point manifesto of UPE (Heynen, Kaika, Swyngedouw, 2006: 11-12) also does not explore this. For me, the engagement with the role of non-human in capitalist production of surplus-value is relevant for this theoretical conversation because in what I discuss in this thesis – the relation between urbanization processes and flooding – the role of non-human is so obvious. I entered this theoretical dialogue (Batubara, 2021) by showing how Swyngedouw's (1996) critique of 'labour-centered' analysis in Smith's production of nature is *socionaturally* relevant because Swyngedouw (1996) aimed to widen the space of politics. I (Batubara, 2021) evaluated Swyngedouw's (1996) *socionature* against Marx's (1867[1982]) capital valorization formula that explains the surplus-value production processes.

Marx's (1867[1982]: 320) *Capital I* formulates the capital valorization formula within a factory through the exploitation of wage-labour. At the beginning, the time t_0 , Marx (1867[1982]) formulates the composition of capital (C) as $C = c + v$; where c stands for constant capital consisting of machinery, equipment, and raw materials; and v stands for variable capital, which is the payment of wage-labour. After the production process, or time t_1 , the capital valorizes. The capital valorization formula now becomes $C' = c + v + s$. C' stands for the total or valorized capital at time t_1 ; and s stands for surplus-value. Marx (1863-1883[1991]: 118) comes again to this point in *Capital III*, where he says: "The portion of the commodity's value that consists of surplus-value costs the capitalists nothing, for the very reason that it costs the worker his unpaid labour".

In Batubara (2021), I identified how Marx seems torn between two different conceptions of surplus-value production. On the one hand, Marx conceives surplus-value as a product of wage-labour's unpaid work exploited by the capitalist; but, on the other hand, Marx also gives signs that this is not the case, that capital needs to grab something from somewhere outside of the wage-labour exploitation. The reason why Marx (1867[1982]) seems torn, according to Batubara (2021), is that, Marx's intention is to explain how capital works with the specific political goal of emancipating wage-labour from capitalist exploitation. Swyngedouw (in Kallis and Swyngedouw [2017: 48]) explains this succinctly that, it is "not Marxist theory that does not value nature but the actual practices of capitalism."

Neil Smith's production of nature also has a political goal of widening the battlefield for change; not only in class struggle between capitalist and wage-labour, but also involving environmental transformations. His aim is to confront the commodification – the move from human and non-human relations dictated by use-value towards relations dictated by surplus- and exchange-value; or the move from production in general to production for exchange and to capitalist production – of nature produced under capitalism. The source of Swyngedouw's (1996) critique of Smith's production of nature then, as explained by Batubara (2021), is the absence of an identification of the role of non-wage labour, or the non-human, in surplus-value production under capitalism both in Swyngedouw (1996) and Neil Smith (1984 [2008]). Batubara (2021) identified this as "Swyngedouw's puzzle".

To make it more clear, Swyngedouw's puzzle can be discussed through Nancy Fraser's (2014: 60) "expanded conception of capitalism". Fraser shows that capitalism expands through "the front-story of exploitation" and "the back-story of expropriation". The first, the "foreground", is capital reproduction in which capitalist exploits the wage-labour (the contradiction between capitalist and wage-labour). Within the latter, the "background condition," there is social reproduction of "provisioning, caregiving and interaction that produce and maintain social bonds" (Fraser, 2014: 61) as well as ecological reproduction within which non-human nature is expropriated by capitalists "both as a source of 'inputs' to production and as a 'sink' to absorb the latter's waste" (Fraser, 2014: 63). It is through the latter, the ecological reproduction that provides the condition for capital reproduction, that I understand Marx's term of "free gifts" of nature (Burkett, 1999). This is the terminology he uses when he explains how capitalists are taking benefit from non-human nature. Marx calls it "free gift" because it is there for the capitalists, without the need for capitalists to make it.

Batubara (2021) solved Swyngedouw's puzzle by establishing a linkage with Jason Moore's (2015) conceptualization of "value-relations." Moore's (2015) value-relations divides surplus-value production into two blocks: exploitation and appropriation. The former refers to the ways in which capitalist exploits the wage-labour – this is Marx's capital valorization formula. The latter refers to the ways in which capital appropriates the cheaps (non-wage-labour, food, energy, and raw material). They are cheaps because the capitalist does not invest in making them, s/he just appropriates them. The cheaps are appropriated into both constant and variable capital. To make the non-human cheaps visible, Batubara (2021) unpacked constant capital and re-notated the capital valorization formula at t_n into: $C' = fcs + coa + e + v + s$; where fcs stands for four cheaps; coa for cost of appropriation, and; e for equipment. Table 2-5 depicts different explanations of surplus-value production in socionatural metabolism.

Table 2-5: Human and non-human roles in surplus-value production under capitalism, made by author.

Human and non-human relations under capitalism	Marx (1867[1982])	Neil Smith (1984[2008])	Swyngedouw (1996)	Fraser (2014)	Moore (2015)
Hybridization	Inseparable	Inseparable	Inseparable	Inseparable	Inseparable
Producer of surplus-value	Human and non-human	Human and non-human	Human and non-human	Human and non-human	Human and non-human
Conception	Wage-labour exploitation	<ul style="list-style-type: none"> • Wage-labour exploitation • Production of nature 	Socionatural metabolism	Expanded conception of capitalism	<ul style="list-style-type: none"> • Wage-labour exploitation • Appropriation of the cheaps
Mathematical notation	$C' = c + v + s$	-	-	-	$C' = fcs + coa + e + v + s$ (notated by Batubara [2021]).

2.1.5 Dialectics of uneven and situated more-than-human and more-than-city

I have explained my interpretation and use of PEU as a theoretical framework, reflected in the title for this sub-chapter and sub-title of this thesis. As I summarized, the critique of “methodological cityism” and the “new epistemology of the urban” re-emphasize the understanding of the city as a sociospatial ontology that is related to other sociospatial ontologies beyond it. Borrowing Harvey’s (1996: 38) words, it is a move from an understanding of “‘the city’ as a thing” into “urbanization as a process”. Because, as Harvey (2001: 72) mentioned early on, “There is a certain ambiguity at the edges (where does the urban begin and end, both physically and conceptually?)”. As I have shown, it is clear that there is a consistent analysis of confronting, or repoliticizing, the uneven production of the environment/ecology in PE, UPE, and PEU. Confronting unevenness as involving not only the contradiction between capitalist and wage-labour, but also the environmental/ecological production within and beyond the city is useful for me in this

thesis as it allows me to critically engage with how flood events in Jakarta were unevenly produced and how flood infrastructural developments reproduce unevenness.

My conception of constitutive moments of unevenness, sociospatiality, and socationature in this sub-chapter is very much influenced by ‘white men’ (Harvey, Swyngedouw, Brenner, and Moore) and ‘white dead men’ (Marx, Trotsky, Lefebvre, and Smith). Meanwhile, as I mention in Chapter 1, there is a lively explosion in urbanization theory. To avoid treating capitalism and urbanization as the same everywhere, and engage with the unevenness of PE knowledge production (Sultana, 2021) through an “engaged pluralism” (Brenner 2018), I connect the sociospatial reconfiguration of the urban to that of the rural and the inseparability of the human (labour) and the non-human (land) by using the explosion of urbanization theory to “situate” (Haraway, 1988) capitalism in the Indonesian context as a ‘concessionary capitalism’. With that I identify Jakarta’s urban poor as an ‘extended agrarian question’ in Chapter 3. Accordingly, I use the dialectical approach to move beyond the rural-urban binary (Peake et al., 2018) and situated post-colonial analysis and feminist critique of Eurocentric knowledge production (McLean, 2018; Reddy, 2018) – which tends to downgrade or marginalize different ways of understanding urban and urbanization (Schindler, 2017) – to connect the sociospatial reconfiguration through urban evictions in Jakarta with rural land dispossession, and the non-human environmental transformations that come with them, in Chapter 4. Fraser’s (2014) “expanded conception of capitalism” enables Chapter 5 to operationalize socationature as methodological device and to foreground the non-human’s role in the uneven sociospatial production of Jakarta’s land subsidence – one of the government’s reasons to move the capital city to Borneo/Kalimantan. In Chapter 6, Smith’s theory of uneven development helps to explain the sociospatial reconfiguration and socationatural transformation both in the production of flood events as well as in the development of flood infrastructures. I now turn to explain my method.

2.2 ECOLOGIZED DIALECTICAL METHOD

This part explains how the entire thesis works. It is not to be confused with the “methodology” sections in Chapter 4 – 6, which describe the more specific data collection and writing strategies for each of these chapters.

When defending my PhD proposal, I proposed a combination of Marxist and Foucauldian theoretical approaches. At that time, my plan was to examine the mechanics of “master processes” (Moore, 2011: 4) of capitalism (such as uneven development, urbanization, agrarian change) and how people experience these mechanics. I planned to stage a conversation between Marxist theories – such as Neil Smith’s uneven development and David Harvey’s uneven geographical development – with Foucauldian approaches of

access (Ribot and Peluso, 2003) and exclusion (Hall, Hirsch and Li, 2011).¹³ During the defense, I was invited to clarify which path I wanted to go; to be more articulate and consistent in the choice of my explanatory frameworks. In other words, I was advised to remove the wavering between Marxism and Foucauldianism.

While doing research, I was often reminded of this advice. Both my fieldwork and my further reading pushed me to choose an analysis of urbanization as seen through the lens of Marxist theorizations. I also discovered that, for me, an explanatory framework is not a solid ready-to-use theoretical block put together before the analysis. Instead, my explanatory framework became one possible way of understanding certain processes, or perhaps a starting point for making sense of empirical observations. Throughout the research, I went back and forth between my empirical findings and my theoretical inspirations. New findings made me revise my analytical framework, while new readings invited me to reinterpret my findings, or even to look for other empirical data. Hence, my explanatory framework saw many revisions and adaptations during the process of research. The research that I did for this thesis, therefore, was also as a process of (re-)conceptualizing and re-theorizing. The interaction between researchers and researched is prominently part of this process. Rademacher (2011) provides a similar description of the ways in which she was searching to find out what urban ecology is all about.

I therefore see the mismatch between my initial explanatory framework and the encountered empirical moments and events as acceptable and even logical. The "hypothetical-deductive" way of doing research is one in which one knows, or pretends to know, the general laws in the field before the analysis. Research, then, consists of feeding empirical information into this pre-established framework to either confirm or refute the hypotheses. This method is derived from the positivist approaches prevalent in the natural sciences (Harvey, 2001: 3-24). My approach is different: I try establishing a logical conversation or dialogue between my explanatory framework and my empirical findings. My thesis, therefore, consists of a back-and-forth between the theoretical and the empirical, always trying to improve and adjust my initial explanatory framework to make the explanation as logical and reasonable as possible. This effort was always explicitly inserted in my overall aim: to generate ideas or identify possibilities for changing the present condition. By referring to Lefebvre, Merrifield (2013: xviii) has called this way of doing research that searches for possibilities for change as "transduction". Transduction is neither induction nor deduction. It is, according to Merrifield (2013: xviii), an "incessant to and fro between concepts and empirical

¹³ The theoretical part of my PhD proposal has been remodified and published in: Batubara, B. (2017). *Ekologi Politis Air: Akses, ekslusi, dan resistensi* [Political ecology of water: Access, exclusion, and resistance]. *Wacana*, 35: 3-24.

observation, between what is and what might be, between what is already here and what might be here more in the future – for better and for worse". Or, in Lefebvre's (2002: 118) words, transduction "goes from the given real to the possible".

The transduction method hinges on a dialectical way of thinking. The dialectical method pays attention to the internal dynamic of a system consisting of processes, relations and flows. Through its recognition of the internal dynamics of a system, the dialectical method has the capability of "producing new concepts and categories to deal with the system under investigation and, through the operationalization of these new concepts, categories, change the system from within" (Harvey, 2001: 58).

Karl Marx is a master of the dialectical way of thinking or dialectical method. Below is a complicated yet beautifully crafted example of how he used the dialectical method to unpack the "internal unity" and the "external antithesis" relations between "sale" and "purchase" in his move to explain commodity circulation (the system):

"Sale and purchase are one identical act, considered as the alternating relation between two persons who are in polar opposition to each other, the commodity-owner and the money-owner...No one can sell unless someone else purchases...Circulation bursts through all the temporal, spatial and personal barriers imposed by direct exchange of products, and it does this by splitting up the direct identity present in this case between the exchange of one's own product and the acquisition of someone else's into the two antithetical segments of sale and purchase. To say that these mutually independent and antithetical processes form an internal unity is to say also that their internal unity moves forward through external antitheses" (Marx, 1867[1982]: 208-209).

That is how commodity circulation (the system) dialectically works. They are two entities and externally "antithetical" ("sale and purchase", "commodity-owner and money owner"), but at the same time they are one in "internal unity" ("No one can sell unless someone else purchases").

In my reading, a major contribution of Karl Marx lies in the ways in which he dialectically engaged with classic political economy. He examined the internal dynamic of the classic political economy formula ("the system") as proposed by Adam Smith: that the value of a commodity consists of $v + s$; where v stands for needed money-capital to pay wage labour, and s stands for surplus (surplus-value, rent, profit) for the capitalist. Marx reformulated the system after the valorization (Capital at time t_1 as I explained in first part of this Chapter) into $C' = c + v + s$. By doing so, he produced new 'concepts' (the valorized capital, C') and 'categories' (c stands for constant capital; v for variable capital;

and s for surplus-value) to deal with the ‘system under investigation,’ and showed how the work of previous labour is contained in the constant capital enabling capital accumulation¹⁴. This in turn allowed making the exploitation of wage-labour within capitalism more visible. The ‘operationalization’ of these ‘concepts and categories’ demands to ‘change the system from within,’ i.e. to end the exploitative capitalist-wage labour relation. In other words, a wage-labour revolution to emancipate the labour from capitalist exploitation is painfully needed (see, Marx, 1885[1978]: 435-463, for a thorough explanation of Marx’s critique of Adam Smith).¹⁵

I almost unknowingly or unconsciously embraced this dialectical way of thinking. The most rational way to explain this is that my intensive reading of Marxist books and texts, those pervaded with dialectical ways of thinking, influenced my own thinking patterns. It was only towards the end of working on this thesis, that I realized how deeply the thesis is shaped by a dialectical way of thinking. Indeed, I now can see the many occasions where it appears. For instance in the dialectical relations between theory and empirical, between concrete (land, water, people) and the abstract (urbanization; agrarian social relations), between the urban and the rural, sociospatial and socionatural moment, human and the nonhuman, and differentiation and equalization. I developed concepts (political ecology of urbanization) and categories (for example, concessionary capitalism in Chapter 3, political water in Chapter 4, extended vertical urbanization in Chapter 5, and uneven urbanization in Chapter 6). All of these concepts and categories are used to deal with the system under investigation (relations between New Order capitalism or uneven

¹⁴ Rosa Luxemburg (1951[2003]: 43-44) explains what constant capital means for capital accumulation: “it expresses the function of the means of production in the process of human labour, quite independently of all its historical or social forms. Everybody must have raw materials and working tools, the means of production, be it the South Sea Islander for making his family canoe, the communist peasant community in India for the cultivation of their communal land, and the Egyptian fellah for tilling his village lands of for building Pharaoh’s pyramids, the Greek slave in the small workshops of Athens, the feudal serf, the master craftsman of the medieval guild, or the modern wage labourer. They all requires means of production which, having resulted from human labour, express the link between human labour and natural matter, and constitute the eternal and universal prerequisites of the human process of production”. Nancy Fraser mobilizes this insight to think through the “internal” and “external” aspects of capitalism, arguing that capitalist (re)production always takes benefit of its “external aspect” – the non-capitalist mode of production, and the social and ecological reproduction (see: https://www.youtube.com/watch?v=zK2VJAW_jHw; accessed on 22 November 2021), which enabled her to explain how capitalism expands, to link Marxism with feminism, and explain ecological crises. Batubara (2021), as I explain in the first part of this Chapter, unpacked the constant capital and re-notated the surplus-value production formula to make visible the role of non-humans in the capitalist production of surplus-value. All of them similarly attempt to ‘change the system from within’ and to widen the battlefield as one that goes beyond the contradiction of capitalist and wage-labour.

¹⁵ We have used the dialectical method in: Batubara, B. and Handriana, E. (2021). Urbanisasi sebagai pabrik krisis sosial-ekologis: Berdialektika dengan *Prisma* 1971-2021. *Prisma*, 40(4): 49-68.

urbanization with Jakarta's floods and infrastructures), evaluated against my 'underground' search for changes, or at least to provide more possibilities of connecting rural with urban social movements.

In this way of searching for changes and providing possibilities of connecting the rural and the urban social movements, as well as the human and non-human, there is a risk for me in the future of being confined by my own work. A risk of being confined in the sense of, following one of Murray Bookchin's (1996: 124) critique of Marxist dialectical method, the provided possibilities can confine one's creativity and imagination, undermining the spontaneity of life-forms. In this case, this thesis can confine my own creativity and imagination, and undermines my own spontaneity. I do not want this work of mine to become my sole source, a fixed guideline, and spend my future life trying to implement what I have charted. In other words, even though I work with this thesis to chart out political possibilities, I need to be ready for surprises in the future. One way to reduce the risk of being confined by my own work is by 'ecologizing' the dialectical method, turning it into a "way of thinking organically" (Bookchin, 1996: 135), in that this is not a final or fixed recipe, but – like organic life itself – a process/development; and accept the possibilities as possibilities, not as a "fixed hypothetical premise" (Bookchin, 1996: 123).

I am internal to these ecologized dialectics – I don't know how to tell this story without myself in it. For me, therefore, this thesis can be also seen as a personal exercise of applying an ecologized dialectical method in order to understand my own life. In searching for a better future, I explicitly situate my experience into this thesis and this thesis into my experience. I traced the "rhizomatic roots" (Stehlik, 2004)¹⁶ of Jakarta's uneven urbanization by starting from the knowledge and experiences of my own colleagues who have been working with the urban poor through their organizing activities in Jakarta. The first person I met in Jakarta for my fieldwork in the early of 2016, was Gugun Muhammad, UPC's community organizer. I already had known him for more than a decade. Given this long relationship, using him as my entry point itself was organic or personal. My thesis would have been, I believe, completely different if I had started for example, by interviewing, and following the network of, someone in one of the government agencies. I choose to meet Gugun because my initial proposal had the intention to deal with unevenness from the perspective and experience of evictees in Jakarta – the survivors of uneven development. I wanted to conduct semi-structured interview with them. Gugun seemed like a good person to start with, as he intimately

¹⁶ I prefer the metaphoric effect of "rhizomatic roots" rather than "snowball". With snowball, you can see your ball on the ground, while in "rhizomatic roots," you are diving to encounter the underground; you expect more surprise.

knows about Jakarta's urban poor. It worked well. Gugun introduced me to Ratna, a resident who at that time lived in Bukit Duri, a kampung that was under threat of eviction to make place for the flood infrastructure development of the Ciliwung River Normalization (CRN) project.

I entered the Bukit Duri urban community through Ratna. I managed to find a room to stay in Bukit Duri; got to know and talked with people in that kampung, attended several community meetings, court hearings, movie screening, public discussions, protests/demonstrations, and participated in community's workshops. I entered those spaces and met the people involved mostly through Ratna's help and network (see list of attended meetings at Annex I) while I was living in Bukit Duri for around five months (February-April and July-September 2016). While living in Bukit Duri, I also became informed about what was happening in other parts of the city through networks of Jakarta's activists. In particular, the *Whatsapp* groups of '*Forum Kampung Kota*' and '*Reklamsi Batal!*' were important sources of immediate information for me about what was going on in other parts of the city. The first is a group of activists, scholars, and journalists organized through the NGO of Ciliwung Merdeka, in which a senior activist, Sandyawan Sumardi, is one of the main figures. The second is another group of activists, scholars, and journalists brought together to resist land reclamation in Jakarta Bay. These two groups importantly shaped my understanding of what was going on in Jakarta, and inspired my reflections on uneven urbanization.

At the time of living in Jakarta, I also organized conversations with several interlocutors from government and non-government agencies: the Jakarta Municipality Water Company of PAM Jaya, the National Development Agency (Bappenas), and water consultants such as Deltares (a Delft-based water company that has been working with the DKI Jakarta government in managing land subsidence and flooding), World Bank's officers, and geoscientists employed by the Indonesian Institute of Sciences and Bandung Institute of Technology (See Annex II for a list of the interviews and conversations I had in making this thesis).

Another important help in conducting semi-structured interviews, was another colleague of mine, Ari Ujianto. I first got to know him in Yogyakarta when I did my bachelor. Ari Ujianto is the UPC/UPLINK's activist who contacted the small NGO in which I worked in 2003 to join UPC/UPLINK network with the task at that time of managing/publishing UPC/UPLINK's newsletter, as I explained in Chapter 1. Ari had worked for UPC/UPLINK as organizer for several years; he transformed to lead the UPC/UPLINK research and development division, and later on as trainer for community leaders and organizers. (He became my co-author for one of the articles that came out from this project – Chapter 4.) His knowledge and network were crucial for being able to conduct semi-structured interviews.

I call these conversations semi-structured interviews because I came with a list of pre-defined questions to be asked. Yet, I also kept my mind open to other information the interviewees shared with us during the conversation. In addition, with many of my interviewees I had follow up conversations.

In addition to discussions with Ari, I also conducted my own observations in Bukit Duri. The knowledge I thus obtained about the context was important in helping me know which questions to ask. In particular, I used these observations to become acquainted with the life histories of the people I met. This, in turn, contributed to my understanding of how the events I witnessed contributed to the reproduction of unevenness.

Together with Ari, we managed to interview 100 urban poor, those living in 5 flood-affected kampungs in Jakarta. The set of predetermined questions can be found in Annex III of this thesis. The results from the semi-structured interview opened the way to a “site multiple” (Connolly, 2019: 73) observations to find out what happened in people’s place of origin that pushed them to move to Jakarta, if they came from somewhere else. Land ownership in rural Indonesia is a central issue as the pushing factor for rural-to-urban migration. Thus, access to land in the place of origin was the main consideration to decide whose place of origin would be followed.

After the urban-based interviews, in the second term of my fieldwork (January-November 2017), I spent three months (September-October 2017) in the village of Kedungwringin, Central Java Province, a place of origin of one of interviewees. In this village again I conducted another set of semi-structured interview with 30 respondents to find out villagers' motivations to move to the city. The list of questions for semi-structured interview in the village can be found in Annex IV of this thesis. When I lived in Kedungwringin, I also managed to interview officers of the state-owned forest company of Perhutani, Kebumen Municipality Water Company (PDAM Kebumen), and Sempor Dam (see, Annex II: list of interviews). I came back for discussion with respondents at *Rusunawa Waduk Pluit* after fieldwork in the village.

The year of 2016 was the heyday of flood infrastructure development in Jakarta, most notably the CRN and National Capital Integrated Coastal Development (NCICD). The eviction of Kampung Pulo and Bukit Duri for the sake of the CRN project made CRN central to Jakarta activist discussions. Because land subsidence is the main reason behind the giant sea wall project of NCICD, land subsidence was always central too in many conversations, including in the above mentioned *WhatsApp* groups. These then two on-going projects importantly shaped this thesis. Hence, I can say, basically I followed things that are discussed by people. I dropped another flood infrastructure development that I identified in my proposal (in Chapter 1), the Jakarta Urgent Flood Mitigation Project/Jakarta Emergence Dredging Initiatives (JUFMP/JEDI). Well informed by activists’ communities, I tried to somehow give back something to these communities as my way to thank them. I presented my works in many discussions with different

stakeholders, NGOs in particular, and from which I was fed with comments. (List of my presentations while doing this thesis can be found at Annex V.)

For the flood infrastructure developments of CRN I used my fieldnotes when living in Bukit Duri as well as several conversations with its people to understand the project. For the ongoing infrastructural intervention development project of NCICD, I identified what it aimed to do for hydrological and land use transformations, and how it reproduces the unevenness – who would be protected or evicted. My inquiry went beyond the city boundaries by following the path from which the project planned to supply cement, the District of Pati in Central Java, as well as sand materials from the adjacent Province of Banten. I choose cement as a one of materials to be examined for practical reasons: I have many colleagues in the peasant movement in Central Java, whose members are rejecting the expansion of the cement industry since they consider it will destroy their farmland and karstic aquifer. I choose sand because Banten is near enough from Jakarta.