

# FLOODING THE SANITARY CITY – PLANNING DISCOURSE AND THE MATERIALITY OF URBAN SANITATION IN HANOI

Keywords: urban political ecology, Hanoi, sanitation planning, urban infrastructures, Global South

## Abstract

Urban water flows are constitutive elements of Hanoi's morphology. Regular floods across the city illustrate that Hanoi's amphibious character is a central impediment to the installation of a "dry and sanitary city", the global modernist ideal of a separation of urban wastewater flows from public space through their redirection into large underground networks. Currently, the first attempt by the city government to construct a city-wide sewerage network since the colonial period is taking place. In accordance with the ideal of the sanitary city it aims at a unification and centralization of hitherto socio-spatially diverse arrangements of sanitation provision in the city. At the same time, rapid urbanization has radically transformed Hanoi, contributing to a continuous diversity of urban sanitation infrastructures and thus defeating the goal of unification and centralization. Starting from an urban political ecology perspective, this paper takes an historical focus to explain Hanoi's sanitation system as emerging from an interplay of discourses and material urbanization dynamics. Arguing that discourses permeate the material reproduction of urban wastewater flows and infrastructures, the paper focuses on the role of the sanitary city ideal for the reproduction of sanitation infrastructures and the contestations and stabilizations of this ideal in Hanoi. Furthermore, the paper addresses the material reproduction of urban sanitation and drainage in Hanoi as part of broader urbanization dynamics, based on a conceptualization of regular floods at the urban fringe of Hanoi as indicators for persisting socio-spatial fragmentations of the city's sanitation system.

## Introduction

Urban water flows are constitutive elements of the capital of the Socialist Republic of Vietnam in the delta of the Red River. Hanoi literally means "city in a river." The presence of water shapes the morphology of the city only roughly 2–7m above sea level. Regular floods across the city illustrate that Hanoi's amphibious character is a central impediment to the installation of a "dry and sanitary city", the global modernist ideal of a separation of urban wastewater flows from public urban space through their redirection into city-wide underground networks transporting wastewaters from households directly out of the city (Heidenreich, 2004; Melosi, 2008). Beyond the technological dimension, the ideal presupposes specific state-society relations, with the state regulating and controlling the large technological

system and thus the sanitary practices of a population that passively receives uniform services (cf. Gandy, 2004).

In Hanoi, the colonial period (1882–1954) and the years since *đổi mới* (renewal) from 1986 onwards, when the country opened up to a market economy, are moments of particular interest concerning the changing topologies of sanitation and the impacts of modernist planning. The colonial period witnessed drastic destructions of pre-existing built structures, as well as the massive growth of Hanoi (Wright, 1991). The construction of a modern city included large-scale redirections of urban (waste) water flows to underground networks and the filling of formerly omnipresent lakes, ponds and swamps throughout the city (Logan, 2000). While the American war and subsequent urban poverty after independence in 1954 slowed down urbanization and expansion of networked infrastructures, reforms in the course of *đổi mới*, such as the lifting of restrictions on the influx to urban centres and on private land ownership, contributed to massive rural–urban migration and urban expansion (Leaf, 1999; Quang and Kammeier, 2002). For instance, according to official statistics, between 1990 and 2009, Hanoi’s population has grown by about 2% annually and has reached roughly 6.4 million (GSO, 2009). This growth has been accompanied by massive expansions of large infrastructure networks since the turn of the century (World Bank, 2006; WHO and UNICEF, 2012).

Currently, the first attempt by the city government to construct a large-scale sewerage network since colonialization is taking place (SRV and HPC, 2005). In accordance with the ideal of the sanitary city, it aims at a unification and centralization of hitherto socio–spatially diverse arrangements of sanitation provision in the city. At the same time, rapid urbanization has radically transformed Hanoi’s morphology and particularly the urban fringe, which displays “a great diversity of intermixed landscapes” (Leaf, 2002, p. 29), a constantly changing conglomerate of centrally planned new urban areas, rapidly urbanizing villages, industries and agriculture. This urbanization process contributes to a continuous diversity of urban sanitation infrastructures defeating the goal of unification and centralization. The interplay of centrally planned network expansion and diverse urbanization dynamics significantly restructure the infrastructural geography of Hanoi. Floods occurring regularly at the urban fringe indicate the contradictions between centralized planning and urbanization dynamics.

Analyses of the political ecology of sanitation planning and practice suggests that the ideal of the sanitary city has been applied only partially in cities of the Global South, leading to segregated access to modern sanitation infrastructures (Kooy and Bakker, 2008; McFarlane, 2008; Gandy, 2006). This paper interrogates the role of the ideal of the sanitary city in Hanoi’s urban sanitation planning and the production of sanitation infrastructures in the colonial period and present. For this purpose, it takes an urban political ecology perspective on the material and discursive production of Hanoi’s sanitation infrastructures. Sanitation planning in Hanoi today has a stronger focus on socio–spatial unification and standardization than in the colonial period, when it attempted to balance existing socio–spatial differentiations with a diversification of sanitation infrastructures. However, I argue that the political ecology of wastewater flows does not only depend on sanitation planning and policy and their respective contestations and inherent contradictions, but that it is also

contingent on broader urbanization dynamics. Furthermore, I show that plans and policies have continuously misconceived these urbanization dynamics and that, since the period of colonization, contradictions have become visible at the edges of centralized network provision, the urban fringes of Hanoi. By analysing place-specific practices in the reproduction of urban space and the redirections of wastewater flows in an urban fringe area of Hanoi, this paper reveals the possibilities and limitations that urban actors have in order to shape sanitation infrastructures beyond formal planning.

[FIGURE 1 ABOUT HERE]

## **The material and discursive production of urban water and sanitation infrastructures**

"Socio-technical processes" of urbanization and the reproduction of urban infrastructures are complex and uneven, temporal and spatial reflections of society (Swyngedouw and Heynen, 2003: 907; Keil, 2003). The ways in which urban infrastructures shape urban space do not depend on infrastructural policies and interventions alone, but rather are contingent on broader urbanization processes and the distribution of resources such as land and housing (Loftus and Lumsden, 2007; Zérah, 2008). Starting from the assumption that the deconstruction of urban water flows serves to unveil power relations and to understand the reproduction of urban socio-spatial inequalities, this exploration of discourses reflected in policies, planning and the material construction of Hanoi's sanitation infrastructures positions itself conceptually in the field of urban political ecology (Swyngedouw and Heynen, 2003).

### *De-constructing the ideal of the sanitary city*

The colonial period is a critical moment for urban waste water flows in the Global South (McFarlane, 2008). In the late 19<sup>th</sup> century, large infrastructure networks became key elements of global urban landscapes, as representations of modernity and progress (Heidenreich, 2004). With regards to urban sanitation, the hegemonic ideal of a "dry and sanitary city" has emerged from a global interplay of discourses on hygiene and citizenship, visions of urban governance and natural-scientific and technological advances in the late nineteenth century (ibid.). The identification of pathogens in wastewater has justified the construction of large, underground networks separating wastewater from public space and flushing it out of the city. Such sociotechnical networks have been rendered possible by engineering advances of the time (cf. Melosi, 2008). With regards to broader urbanization dynamics, they presuppose a bounded city, where wastewaters are produced, and which is clearly divided from a rural hinterland as the sink for these wastewaters. The ideal of the sanitary city furthermore assumes and at the same time pursues particular state-society relations, as the operation of these large technical networks is to be

regulated by the state, which thus provides ubiquitous and non-exclusive services at uniform tariffs to an urban population passively receiving these services (Oosterveer and Spaargaren, 2010; Gandy, 2004). The ideal expresses a bio-political vision of the state controlling the hygienic behaviour of citizens whose households are connected to large, state-regulated networks via flush toilets (cf. Bakker, 2013). Kaika and Swyngedouw (2000, p. 125) emphasize the symbolic meaning of these technical networks and artefacts as material representations of the apparent “mastering and taming (of) nature” by human beings. Colonialization has activated the global travel of such rationalizations, which have shaped wider urban policies worldwide. Despite the ideal’s orientation towards ubiquitous access of all urban dwellers to centralized networks and thus its potential contribution to urban socio-spatial cohesion, scholars attest that the ideal of the sanitary city has regularly had reverse effects on geographies of wastewater flows in cities of the Global South (Kooy and Bakker, 2008; Zérah, 2008). For an understanding of these dynamics, the concept of the “sanitation syndrome” (Swanson, 1977, p. 387) is insightful, as it explains how colonial urban planning, where “urban race relations came to be widely conceived and dealt with in the imagery of infection and epidemic disease”, became the ideological basis for socio-spatial segregation.

An urban political ecology approach reveals how dominant ascriptions of meaning concerning practices in urban sanitation, health and hygiene were used to construct a series of dichotomies and resulting logics of urban governance between “colonizer” and “indigenous”, “modern” and “traditional”, “developed” and “underdeveloped”; “sanitary” and “insanitary”. It furthermore illustrates how this dichotomy has then been materially manifested in urban space through segregated and racialized access to modern sanitation infrastructures (Swyngedouw, 2004; Kooy and Bakker, 2008; McFarlane, 2008). Urban scholars draw on this dichotomy as an explanation for the perpetual socio-spatial fragmentations of cities in the Global South that reveals the contradictory impacts of the infrastructural ideal on urban sanitation systems and its contested nature (Gandy, 2006; *ibid.*).

Studies on urban sanitation in the Global South establish a clear link between sanitation plans and policies in the colonial era based on the hygienist ideal of the sanitary city and socio-spatially fragmented urban spaces. However, from the 1970s onwards, the relations between formal urban planning and actual urbanization dynamics have loosened in cities of the Global South (Gandy, 2004). Urban infrastructure studies suggest a change in governance rationality, with state interventions in urbanization processes and everyday lives of citizens becoming less coercive and transparent, and more indirect and incoherent (Kooy and Bakker, 2008; Loftus and Lumsden, 2007; Li, 2007). This greater opacity concerning the influence of formal planning and governance on urban space concurs with a blurring of the role of the ideal of the sanitary city for place-specific urban geographies of resource distribution. Along with developments such as the rise of the neoliberal project, the idea of absolute limits to growth and the turn towards sustainability, a range of concepts and approaches to urban spatial and sanitation planning have emerged, rendering the definition of a globally circulating ideology guiding urban development and infrastructure planning worldwide extremely difficult (Graham and Marvin, 2001; Castree and Braun, 2001; Pincetl, 2010). In light of these

complexities, the study of sanitation planning and the reproduction of Hanoi's urban space and sanitation infrastructures contributes to an understanding of the changing influence of the circulating ideal on state action and planning, and on the diverse and multifaceted urbanization processes in cities of the Global South.

### *Discourse and materiality in urban infrastructure studies*

A central concern of urban political ecology is the analysis of urban infrastructures as material mediators, transforming natural resources such as water into commodities (McFarlane and Rutherford, 2008; Monstadt, 2009). Some scholars argue that the critical project of urban studies, to unveil the ways in which capital flows mediate and shape urban socio-spatial inequalities and dynamics of resource distribution, cannot benefit from poststructuralist approaches (e.g. Brenner *et al.*, 2011). However, urban political ecology in particular has drawn upon poststructuralist-inspired accounts of discourse formation and contestation and has produced new insights from it (e.g. Castree, 2002; Kaika, 2006; Lawhon *et al.*, 2014). Heynen *et al.* (2006, p. 7) powerfully express these interdependences between materiality and discourse when they state that “the material production of environments is necessarily impregnated with the mobilization of particular discourses and understandings [...] of and about nature and the environment” (cf. also Kaika, 2006). Policies and plans are material artifacts and at the same time represent ascriptions of meaning, discourses about cities and infrastructures, and visions of urban futures (Rutherford, 2013; Brenner *et al.*, 2011). An examination of plans and policies thus helps to unpack rationalities and governance logics concerning the possibilities and limits to reform of certain aspects of society (Dean, 2010 [1999]).

However, the inclusion of formal plans and policies does not imply that the physical artefacts and networks directing urban resource flows are the intended result of a “kind of overarching ideological superstructure” (Latham and McCormac, 2004, p. 711). Based on the recognition that urban materiality emerges through processes beyond central planning and control, researchers of urban infrastructures worldwide turn towards people's activities and practices in the reproduction of urban space, environments and infrastructure (Rutherford, 2013; Kooy and Bakker, 2008). Although the limitation of plans and policies concerning the explanation of emerging urban forms is not confined to the Global South, it is particularly apparent there, where formal policies and strategies are often distant from urban dynamics of resource distribution and living conditions (Kooy and Bakker, 2008). Lawhon *et al.* (2014, p. 512) emphasize the need to study “everyday modalities through which ordinary people link together to provide for their lives” beyond the centralized provision of services. Scholars thus focus on individuals' activities and their improvisations in the making of urban environments in order to identify new potentials for progressive change (*ibid.*; Loftus, 2012; Coutard and Guy, 2007).

Starting from these developments in urban political ecologies, this paper takes an historical perspective to explain Hanoi's sanitation system as emerging from an interplay of material artefacts and practices, as well as discourses. Arguing with Heynen *et al.* (2006), that discourses permeate the material reproduction of urban

wastewater flows and infrastructures and that they constitute and reflect social circumstances and relations (cf. also Belina and Dzudzek, 2009), this study focuses on the contestations and stabilizations of the ideal of the sanitary city in the reproduction of urban space and wastewater infrastructures in Hanoi. Conceptualizing regular floods in specific places of Hanoi as indicators for persisting socio-spatial fragmentations of sanitation systems, the paper addresses the material reproduction of urban sanitation and drainage in Hanoi as part of broader urbanization dynamics.

## **A dry and sanitary city or a city in flow? Sanitation planning and practice in Hanoi in the colonial era and present**

Hanoi's colonial and contemporary sanitation discourses reflect particular rationalizations of the sanitary city concerning the construction of socio-spatial difference or cohesion as well as the sanitary conduct of citizens through technologies. These rationalizations as well as contradictions inherent to the ideal of the sanitary city become apparent in the contestations of sanitation planning and the material reproduction of sanitation infrastructures. Furthermore they are contingent on broader urbanization dynamics. As I discuss below, discourses framing the city as a bounded entity are immanent to the ideal of the sanitary city and at the same time continuously contradict Hanoi's urbanization dynamics. The contradictions between the attempted construction of fixed boundaries and the moving passages constituting Hanoi's urban space and sanitation infrastructures become specifically apparent at the edges of centralized network provision, the city's urban fringes.

### *Addressing socio-spatial differentiations of sanitation in Hanoi*

Colonial sanitation plans expressed the intention to construct a centralized city-wide network at the beginning of the 20<sup>th</sup> century, but at the end of French colonial rule Hanoi's sanitation technologies were still spatially differentiated (cf. Lyard, 1905; Conseil Municipal, 1935). After approximately fifty years of French rule, plans were, like in many colonial towns and cities, based on a spatial segregation of ethnic groups (Fig. 2).

[FIGURE 2 ABOUT HERE]

The 36-streets area, a quarter French colonial planners reserved for the 'indigènes' – a diverse group that mostly consisted of Vietnamese and also Chinese traders and workers – was given special attention by formal urban planning (Fayet, 1939). At the beginning of the 19<sup>th</sup> century, the construction of networked sewerage in this quarter contributed to an improvement of living conditions (Waibel, 2002). However, for members of the late colonial urban government, the sanitary situation remained unacceptable. As the Conseil Municipal (1939, p. 5) reveals, they considered the prevalent night-soil collection as "The most unsanitary we can conceive" and

"serious inconveniences."<sup>1</sup> These evaluations served as a justification for the investment of 1/3 of the costs of a 6-million-franc sanitation project into this district alone (ibid., p. 8). Domestic wastewater and rain water were to be separated from toilet wastewater and flow into sewerage networks without pre-treatment (Fayet, 1939). Urban engineers proposed the construction of such networks in the already highly urbanized and densely populated quarter, while the colonial quarter was to rely on septic tanks and the already existing combined sewerage system. This was the less costly and less advanced technical option. Beyond investments in artifacts for city-wide use, such as centralized treatment plants, urban engineers did not reserve any funds specifically for the reconstruction of the sanitation system in colonial quarter (cf. Conseil Municipal, 1939, p. 8). According to formal planning, sanitation in this quarter thus required less public funding and at the same time more action by individual households, as they were responsible for the maintenance of the septic tanks, particularly the regular emptying and cleaning of filters. Fayet's justification for the prioritization of the indigenous quarter in terms of sanitation investments reflects the hegemonic discourse of the time and its ascriptions to colonized populations regarding their hygienic behaviour and education:

"The installation of septic tanks in the native quarters would be a serious mistake in our opinion because the education of the Annamite masses regarding hygiene is not sufficient to entrust them with the operation of such devices."<sup>2</sup> (Fayet, 1939, p. 25)

This plan did not explicitly aim to reinforce urban socio-spatial fragmentation through sanitation infrastructures. This is in contrast with colonial sanitation planning in other cities of the Global South, which has pursued a complete isolation of the quarters of colonial elites from local populations and the latter's exclusion to networked infrastructures (cf. Kironde, 2007). On the contrary, Hanoi's urban engineers aimed to compensate the diversity of living conditions and behaviours through the construction of urban sanitation infrastructures. However, these socio-spatial differences, which colonial planners and engineers adapted sanitation infrastructures to, were not only identified by the planners themselves, but they had also discursively and materially constructed them. These constructions of socio-spatial difference become particularly apparent in the interplay of sanitation planning with broader urban policies and strategies. For instance, the high living costs, when paired with the discrimination of Vietnamese people when it came to earned incomes predicated the exclusion of wide parts of the urban population from the colonial quarter and restricted them to the indigenous quarters (cf. e.g. République Française, 1926). This demonstrates how the "sanitation syndrome" (Swanson, 1977), and its racist ascriptions of unhygienic behaviour to colonial subjects, has informed governmental practices in Hanoi. These practices in turn

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<sup>1</sup> "Le plus antihygiénique que l'on puisse concevoir" and "inconvenients graves."

<sup>2</sup> "L'installation de fosses septiques dans les quartiers indigènes constituerait à notre avis une grave erreur parce que l'éducation au point de vue hygiène de la masse annamite n'est pas suffisante pour lui confier le fonctionnement d'appareils."

have reinforced socio-spatial inequalities despite the stated intention to counterbalance them by means of sanitation infrastructures.

The analysis of documents informing the “Hanoi sewerage and drainage environmental improvement project” currently under way makes the differences and continuities between colonial and current planning apparent. First of all, both plans were designed by an external group of experts. In the case of the current plan it was the Japanese International Cooperation Agency (JICA), which designed this plan for the city government of Hanoi, the Hanoi People’s Committee, and the National Assembly of Vietnam. To date, one billion USD have been invested in the construction of large-scale sewerage plants, financed with a loan by the Japan Bank for International Cooperation (JBIC) (cf. SRV and HPC, 2009). The current plan gives technical details but does not elaborate on the ethnicity or hygienic behaviour of different population groups (SRV and HPC, 2005). The plan refers to spatial differences exclusively with regards to population densities, presenting these differences as relevant only for technological and economic considerations. On top of this, it proposes to maintain the existing combined sewerage system that covers the central parts of the city and provisions a large part of investments for urban fringe areas, where no centrally planned underground network is in place (SRV and HPC, 2009, p. 6). Septic tanks, which colonial planners have regarded as a technology that was suitable for colonial elites, are no longer part of Hanoi’s formal sewerage planning. This is the case although they are today the most common, albeit ineffective means of sanitation in the city (cf. Việt Anh *et al.*, 2005). Instead of proposing changes in the existing urban sanitation system, the JICA plan focuses on interventions at the urban fringe, where it envisages “central large-scaled wastewater treatment plants” (cf. SRV and HPC, 2009).

The JICA project displays reduced confidence as compared to the colonial one to reform the hygienic behaviour of the urban population through the provision of particular sanitation technologies, or to fundamentally change existing sociotechnical sanitation arrangements within densely built-up urban space. This becomes evident in the current plan’s focus on technical and economic issues, the emphasis on urban fringe areas and the exclusion of analyses of practices of population groups divided along race and income. A comparison of the plans indicates sanitation planners’ changed beliefs regarding the rights of populations, their duties as well as their status. Colonial planners had differentiated between the colonial elite as a group, which actively engages in sanitation provision, and the “indigènes”, who could not be trusted with such tasks. In contrast to this, the current plan presupposes a rather uniform population, whose members are to receive equal services since they are constituted as equally passive. These differences reflect broader changes in the relation between urban engineers, governments and populations that shapes sanitation infrastructures in Hanoi, as well as a changed rationality of governance. The current plan abandons the colonial idea of a socio-spatial differentiation of the city’s population while promoting a greater unification and centralization of urban space via sanitation infrastructures.

Despite the technical language of planning documents and the absence of discriminatory rhetoric, the project has triggered an intense public debate. This debate illustrates the fact that urban sanitation is a politically contested issue. A



local newspaper deems the project “inappropriate, ridiculously expensive and useless” (24h, 2010, original Vietnamese). This evaluation summarizes the points of criticism that are held by sanitation engineers, planners and academics. Project costs rose to 800 USD/person. According to an international water expert, costs between 200 and 600 USD/person were already considered high, even for such “heavy engineering” sanitation projects (Interview: Urban Water Supply and Sanitation Adviser, ADB, 2011). A sanitation expert from Hanoi expresses frustration, as the large amount of money spent appears to mainly benefit the Japanese consultancy firm:

“The Japanese Bank wants to have this approach because they can give a loan. And they have conditions. We have to buy Japanese equipment; have to hire only Japanese consultants.” (Interview: Professor, Hanoi University of Civil Engineering, 2009)

The impression that the project is not only expensive but also useless for Hanoi is rooted in the observation that the artifacts constructed within the project are mostly on a pilot scale, the treatment plants are out of operation and the pumping station’s capacity is insufficient (Quốc Dũng, 2010). The state of repair and maintenance of the plants reflects the financial and personnel capacities of the utility company responsible for drainage and sewerage in Hanoi. The project proposes a tariff increase to cover operation and maintenance costs in line with national legislation. However, a debate is ongoing between the Ministry of Construction (MOC), which oversees the urban utilities and regulates wastewater tariff setting, and the city government of Hanoi, which owns the utility company and sets tariffs within a range stipulated by the MOC. This debate concerns the future design of wastewater charges (88/2007/ND-CP; SRV and HPC, 2009; Interview: Chief Technical Adviser, GIZ, 2011). Currently, the only fee for public sanitation in Hanoi is a 10% surcharge on the water tariff (ibid). Revenues are far too low for the utility company to operate. However, the process of introducing cost-effective tariffs stalls, as members of the People’s Council – Hanoi’s municipal council – oppose increases in sanitation costs, fearing the loss of political support and future elections (cf. De Miras and Nguyen, 2010). This superficial implementation of the ideal of the sanitary city, which includes the construction of large-scale artefacts and networks, but excludes financial arrangements to maintain them, reveals contestations between the different levels of government in Vietnam in relation to sanitation planning and policy. In response to these contestations, urban planners, engineers and academics think the project inappropriate for Hanoi. They demand a differentiation of the city’s sanitation infrastructures, with a place-specific inclusion of decentralized low-tech means of sanitation – such as septic tanks – into formal sanitation policy and planning (Interview: General Director, HACTRA, 2011; Harada *et al.*, 2010).

The ambitious sanitation project, its piecemeal implementation and the ongoing debates surrounding it illustrate the fact that the hegemonic ideal of the sanitary city remains an important and yet contested reference of sanitation planning in Hanoi. A comparison of colonial and present sanitation discourse shows that they address the socio-spatial differentiation of sanitation infrastructures and the conduct of populations in different ways, with the current plan being largely silent on these issues. These differences reflect the uneven relations between the actors involved. The fact that French municipal engineers explicitly shared their ideas

about the population's hygiene as well as the population's behaviour towards the French colonial government reveals the way in which they have positioned the government and themselves in relation Hanoi's population. They have regarded themselves and the colonial government as external observers, jointly assessing the colonial subject. In contrast, the approach by the Japanese planning team underscores their role as consultants external to the Government of Vietnam. And it suggests that the government as the co-author of the study is more answerable to the entire population of Hanoi than the French colonial government had been.

The current plan confines itself to proposing a centralized and uniform infrastructure system. However, the superficial appropriation of the ideal of the sanitary city raises the issues of infrastructural inequality today, despite the silence of formal planning on these issues. Critics warn that the superficial implementation of the plan reinforces socio-spatial discrimination and therefore demand the consideration of sanitation technologies adapted to specific localities (Interview: General Director, HACTRA, 2011; Interview: Urban Planner, Hanoi, 2011; Harada *et al.*, 2010). In sum, the topologies of Hanoi's sanitation infrastructures reflect contradictions and contestations of the sanitation sector. However much sanitation planning and its inherent contradictions shape these infrastructures, it is important to keep in mind that they are also contingent on broader urbanization dynamics.

#### Fixed boundaries or moving passages – Hanoi's growth dynamics in the colonial era and present

The dynamics of urbanization and their perception by Hanoi's urban governments are central in order to gain an understanding of the material reproduction of sanitation infrastructures in the city. While formal policy and planning within the sanitation sector have aimed at socio-spatial unification through the installation of large technological systems, Hanoi's broader urbanization dynamics have been uneven and diverse. Hanoi's flow of wastewater and its place-specific dynamics of drainage and flooding are material manifestations of the particular interplay of both policies and practices in the reproduction of urban space.

The colonial sanitation project was based on the assumption that the city would grow until it had reached a definite end, as the sanitation engineer Fayet (1939, p. 5) suggests, "assuming the city reaches its maximum extension."<sup>3</sup> This delineation of the geographical limits of the urban area defines the point to up to which the central network should and could be expanded in order to reach completion. "We therefore have to complete the existing network"<sup>4</sup> (*ibid.*). The clear boundary between urban space, where wastewater is produced, and an open natural space beyond Hanoi that serves as the sink, is inherent to the ideal of the sanitary city. This is reflected in the project which states that wastewaters were to flow "as fast as

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<sup>3</sup> " en supposant la Ville arrive à son extension maximum."

<sup>4</sup> "Il faut donc compléter le réseau actuel."

possible to their final destination"<sup>5</sup> (Fayet, 1939, p.16; Fig 3). This perception of a bounded city still underlies urban infrastructure planning in Hanoi.

The documents of the current sanitation project are in line with the provisions of the general urban master plan concerning the location of network expansions (SRV and HPC, 2009). This plan provides a clear delineation between the space to be urbanized and the open naturalised space beyond (PPJ, 2010; Fig 4). The sanitation plan reinforces this distinction by depicting a networked urban space with wastewater treatment plants at the periphery that direct urban wastewaters into open water bodies beyond the networked territory of urban Hanoi (SRV and HPC, 2005). Colonial planners were already aware of the existence of unplanned, densely populated “indigenous” settlements directly beyond the notional borders of the city. This made apparent the failure to articulate a definite urban boundary, as “villages and suburban areas... extend the city and mix with it sometimes”<sup>6</sup> (Conseil Municipal, 1935). The sanitary situation of these settlements, where sewers discharged wastewater from spaces formally declared as urban, was not in accord with the image of Hanoi as the “Paris de l’Annam” (Ngô, 2009). A public health official from the period described the “undirected extension” of Hanoi as an unresolved planning issue (Hermant, 1936, p. 27). However, the question of how this issue should be resolved, whether through the construction of a satellite sewerage network or the connection of these areas to the central network was not given an answer to (ibid.). Instead, urban planners and engineers continued the construction of the central network based on the boundary set as the maximum urban expansion of Hanoi excluding the settlements at the urban fringes beyond this boundary.

[FIGURES 3 and 4 ABOUT HERE]

Today, Hanoi stretches far beyond the “maximal expansion” stipulated within colonial plans. Its western urban fringe, the area west of the Tô Lịch River, displays extremely dynamic and contrasting urbanization patterns (cf. Fig 5 and 6). As part of the creation of the urban district Cầu Giấy at the western bank of the Tô Lịch River, formerly independently governed villages became part of the urban ward Trung Hoà in 1997 (Labbé, 2014; Interview: Vice Chair, Trung Hoà, 2009). Among them was the village of Hạ. The incorporation of areas west of the Tô Lịch River into the city of Hanoi has increased top-down control of urban development by the city administration. From 1997 onwards, several sewerage networks and artifacts were installed across the ward and its villages (Interview: Vice Chair, Trung Hoà, 2009). According to formal wastewater planning, the Nhuệ River, west of Trung Hoà, is to receive the bulk of wastewater from the area and a smaller fraction is to flow into the Tô Lịch River at the eastern border of the ward. To direct water streams accordingly, two of the largest pumping stations of Hanoi have been installed within the current wastewater project (SRV and HPC 2005; 2009).

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<sup>5</sup> “le plus rapidement possible vers leur destination finale.”

<sup>6</sup> “Les villages et les quartiers suburbains... prolongent la ville et se confondent parfois avec elle.”

[FIGURES 5 and 6 ABOUT HERE]

More recently, a clash of urbanization logics within the ward has changed the planned direction of wastewater flows. Instead of flowing into the Nhuệ River, wastewaters regularly flood the village Hả. The water surfacing from the sewerage channels can be regarded as a material indicator for the incompatibility of differently networked infrastructures. This incompatibility of individually functional networked systems is rooted in the particular urbanization dynamics these networks evolve in. These dynamics are contingent on the extension of the formal boundaries of Hanoi to include the area, which has facilitated the centrally planned development of housing estates, so called new urban areas, and contributed to accelerated urbanization (Han and Vu, 2009; Fig 7). Between 1992 and 2009, the agricultural area in the ward has decreased from 130 ha (approx. 50% of the total area) to 8 ha (approx. 3%) (Interview: Vice Chair and Surveyor Trung Hoà, 2009). The development of new urban areas differs from the densification of villages with regards to administrative procedures, actors involved and building patterns. Villages urbanize within incremental processes that are mediated between individuals and local administrations (cf. Leaf, 2002). They are often “semi-legal” as individuals who own plots legally sometimes subdivide these without formal permission, which is mostly tolerated by local administrations (Interview: Programme Manager, UN-Habitat, 2009; Koh, 2006). Specific sociotechnical sanitation arrangements enable, and are at the same time shaped, by these urbanization dynamics. Urban residents and local administrations construct sewerage lines incrementally as the village grows. These lines combine storm water and household wastewater runoff and follow the particular road patterns, where smaller roads branch off the main roads and ultimately end in cul-de-sacs. The village of Hả has an intricate system for the management of the sewerage system. While the public utility manages the sewer lines along main roads, the district collects funds for repair works in the smaller streets. In cases of minor problems, people take over maintenance works:

“In the smallest alleys, people [...] care for themselves. On Saturday mornings, all residents improve the drainage system together.” (Interview: Head of Household Group, 2011)

Members of the local administrations regard these constellations as functional. People are willing to take part in activities and to pay regular fees to the utility company and the district for maintenance works. A district official relates this to the “better social cohesion” that exists in the villages as compared to new urban areas (Interview: Vice Chief, Cầu Giấy Centre of Land Resource Development, 2009). Thus, urbanization processes outside formal regulations with active cooperation between local administrations and communities shape the village of Hả (Fig. 8). As Koh (2006, p. 14) observes, a “mediation space” exists between local level administrations and households. This gives urban dwellers the possibility to express as well as act in favour of their interest, participate in urban development and management, and to circumvent formal regulations even in the hierarchical top-down planning regime of Hanoi.

[FIGURES 7 and 8 ABOUT HERE]

In contrast to this, investors develop new urban areas based on city master planning. As has been noted, city planning officials and investment companies form coalitions, which promote the development of real estate and profit from it (Han and Vu, 2009; Labbé and Boudreau, 2011). On numerous occasions, city planning officials have compromised on planning provisions and the design quality of estates in order to maximize profits (cf. MONRE, 2012). In the new urban areas of Trung Hoà, the construction process of sanitation infrastructures, the physical layout of networks and plants and their management starkly differ from those in the urban villages. They reflect city planners' negligence of broader infrastructural issues, the urban system of water flows and particularly their ignorance of the villages that are adjacent to residential estates (Interview: Administrator, Cầu Giấy Development Centre for Urban Infrastructure, 2011). As opposed to the combined sewerage systems in the villages, storm- and household wastewaters of new urban areas flow into separate underground drainage networks. In order to ensure drainage of the estates in Hanoi's flat terrain, they are built on elevated ground (Interview: Senior Representative, JICA, 2011). These elevations effect a redirection of water flows – in Trung Hoà, surface water no longer flows to the western Nhuệ River but to the Tô Lịch River in the east (Interview: Urban Planner, Hanoi, 2010, Interview: Professor, Hanoi University of Civil Engineering, 2009). City-level developments of residential estates thus contradict city-level sanitation planning.

These contradictions become obvious during regular floods in places surrounding the estates (MONRE, 2011a). The sewerage networks of the new urban area Trung Hòa Nhân Chính block the drainage channels formerly connecting Hạ to the Nhuệ River since the construction of the estate in 2005 (Interview: Vice Chair, Trung Hoà, 2009). Thus, wastewater stalls in the village and regular floods expose villagers to multiple health risks (Interviews residents, 2009/2011). As one resident explains, the floods resulting from accelerated urbanization and the lack of coherence between urban development planning and sanitation planning are a major concern for residents.

“Here, we are most interested in wastewater.... Before, there were many fields and vegetables. Now only a few are left. How can we avoid flooding?” (Interview: resident, 2011)

The apparent disregard for villages in planned real estate development in Trung Hoà contrasts with the claim of a planning official in Hanoi who stated that the master plan aims to preserve urban villages for their “historic value” and the fact that they supposedly represent “the traditional culture and crafts of Vietnam.” (Interview: Vice Director, HAUPA, 2008). For local administrations, the incompatibility of sanitation infrastructures in new urban areas and villages poses a central challenge.

“The connection of old and new parts is a problem. Today, wastewater streams in new urban areas are separated. The old villages are... urbanized already. How are we supposed to separate wastewater streams? (Interview: Administrator, Cầu Giấy Development Centre for Urban Infrastructure, 2011).

The infrastructural disconnect reflects broader urban governance issues. A void of responsibility exists concerning the connection of villages and new urban areas. District and ward officials are not actively involved in the construction process of new urban areas, but “must accept planning of the Hanoi People’s Committee” (Interview: Vice Chief, Cầu Giấy Centre of Land Resource Development, 2009). According to the ward official this is problematic and “the distribution of tasks and responsibilities hinders the cooperation between different actors” (Interview: Vice Chair, Trung Hoà, 2009). Currently, investors are responsible for the construction of infrastructure within the new urban areas only, but not for their connection to surrounding networks. According to a district engineer, this should be different, as the “construction company that ruins the old system should repair it.” He furthermore considers the ward authority responsible for the management of this process (Interview: Vice Chief, Cầu Giấy Centre of Land Resource Development, 2009). In contrast, the ward official does not consider the establishment of network links to be one of the ward’s tasks, as it lacks the financial resources (Interview: Vice Chair, Trung Hoà, 2009).

In sum, the surfacing water in the village of Hạ indicates that conflicting urbanization processes clash in Trung Hoà ward, and this clash has a direct effect on the living conditions of urban villagers. At the same time, the material processes at work in this case reveal that the topology of the sanitation network is not the intended outcome of particular urban sanitation plans and policies towards the discrimination of specific neighbourhoods. These are contingent on negotiations between actors within and outside local state administrations. Local district and ward authorities tolerate the by-passing of formal rules by villagers, while city planners engage in real estate development that contradicts formal city level sanitation planning. Thus, activities by administrations on the central and local levels and their interaction with civil society and private companies shape the urban form and the materiality of Hanoi’s urban sanitation system beyond pre-existing plans. These dynamics demonstrate the contested nature of sanitation discourse and materiality, as well as the contradictions inherent to the ideal of the sanitary city. The idea of Hanoi as a city with fixed boundaries, whose development can be centrally controlled has persisted through both colonial and post-colonial planning, even as they have been steadily contested.

## **Conclusion**

This study of Hanoi’s sanitation discourses and materialities in the late colonial period and the present reveals the ways in which the ideal of the 'sanitary city' has shaped sanitation discourse, artefacts and networks, as well as their everyday reproduction. Colonial sanitation planning in particular was motivated by a "sanitation syndrome" that discriminated between population groups based on an understanding of some sanitary technologies and practices as unhygienic. However, contrary to what some scholars suggests, this did not lead to the socio-spatial segregation of races in the city (cf. e.g. McFarlane, 2008; Swanson, 1977). Instead, Hanoi’s colonial sanitation plans and policies have promoted the compensation for inequalities via the provision of infrastructures. This did not alleviate socio-spatial

segregation, which functioned in indirect ways. These policies have contradicted colonial sanitation planning for the standardization and unification of the diverse urban spaces of Hanoi, demonstrating the incoherencies inherent to state action.

While colonial sanitation discourse had differentiated between population groups, located them in different parts of the city and ascribed particular hygienic practices and behaviours to them, current sanitation and drainage planning refers to socio-spatial differentiation in terms of population densities only. It does not directly address, let alone differentiate, between the hygienic behaviour of population groups. Instead, it promotes a centralization and unification of sanitation infrastructures. At the same time, current sanitation planning and policies have remained stable with regards to some basic points of reference that stem from the modern ideal of the "sanitary city", persistently viewing urbanization dynamics as finite and containable and of urban space and infrastructures as controllable by urban administrations. This is the case even though the assumptions underlying formal urban planning in Hanoi were already challenged by urban realities in colonial times. The place-specific floods, which regularly occur at Hanoi's urban fringe, indicate that urban sanitation planning towards unification and centralization permanently contradicts the messy and unforeseeable ways in which state and non-state actors reproduce urban space and expand infrastructure networks beyond formal planning. The fragmentations and incompatibilities of sanitation networks in Trung Hoà reveal that socio-spatial differentiation is no longer the intended outcome of plans and policies. It also does not depend on the contested nature and piecemeal implementation of sanitation policy and planning according to the sanitary city alone, but it is rather contingent on clashing urbanization logics and their inherent incompatibility with sanitation planning. The redirections of urban water flows towards the village unveil the contestations that are constitutive of the hegemonic ideal of the sanitary city. Since the colonial period, these have continuously contributed to a material reproduction of socio-spatial fragmentations at the urban fringe of Hanoi, even though current plans and policies do not explicitly refer to these dynamics.

The focus on the redirections of (waste) water flows at Hanoi's urban fringe makes apparent that there is a space where ordinary people – individuals as well as local state actors – realize changes to pre-existing planning and policy (cf. Lawhon *et al.*, 2014). At the same time, it reveals the limits that these actors face when they aim to enforce their particular interests. While they may circumvent and change top-down regulations and thus shape urbanization within villages, they have little influence on the coalitions between city level planners and investment companies in their neighbourhood. Their activities contradict city-level sanitation planning towards the ideal of the sanitary city as much as those of urban villagers in the reconstruction of sewerage networks. The examination of Hanoi's sanitation infrastructures from a perspective sensitive to the formation of discourse as well as practices in the reproduction of urban space thus contributes to a differentiated understanding of the ideal of the sanitary city, its inherent contradictions and its changing interrelations with broader urbanization dynamics.

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