Power, nature, and the city. The conquest of water and the political ecology of urbanization in Guayaquil, Ecuador: 1880–1990

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Abstract. In this paper, I seek to explore how the circulation of water is embedded in the political ecology of power, through which the urbanization process unfolds. I attempt to reconstruct the urbanization process as simultaneously a political-economic and ecological process. This will be discussed through the exploration of the history of the urbanization of water in Guayaquil, Ecuador. As approximately 36% of its two million inhabitants has no access to piped potable water, water becomes subject to an intense social struggle for control and/or access. Mechanisms of exclusion from and access to water, particularly in cities which have a problematic water-supply condition, lay bare how both the transformation of nature and the urbanization process are organized in and through mechanisms of social power. In order to unravel the relations of power that are inscribed in the way the urbanization of nature unfolded I document and analyze the historical geography of water control in the context of the political ecology of Guayaquil's urbanization. In short, Guayaquil's urbanization process is written from the perspective of the drive to urbanize and domesticate nature's water and the parallel necessity to push the ecological frontier outward as the city expands. I show how this 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.

“Agua, drama sin final” El Universo 1991, 14 July.(1)

“Urban and rural landscapes ... are not two places but one. They created each other, they transformed each other's environments and economies, and they now depend on each other for survival ... We all live in the city. We all live in the country. Both are second nature to us”

Cronon, 1991, pages 384–385

Water, power, and the city
Guayaquil, Ecuador's largest and economically most powerful city, situated on the Pacific shore of the country's humid lowlands, suffers from immense water problems (figure 1, see over). The coverage of the urban water network fell from 73% to 64% between 1974 and 1990, whereas the number of people lacking access to piped potable water rose from 222,269 to 596,013 (INEC, 1974; 1990). Other sources suggest that the rate of water coverage is even poorer. Arellano (1992), for example, maintains that the rate of water coverage fell from 76% in 1975 to 54% in 1991 and to as low as 50.3% in 1992. In sum, almost half of the approximately two million residents have no access to reliable sources of potable water and water shortages are a chronic problem. Those who lack connections to the water-distribution system are dependent on a small army of about four-hundred private water vendors. The unconnected part of the population have to make do with only 3% of the available water, but have to pay a water price which is up to four-hundred times (40,000%) higher than that paid by the low-volume consumer. Despite an average daily production capacity of 220 litres of water per inhabitant, they live on an average of 20 litres of insalubrious water a day (see Swyngedouw, 1995a).

(1) “Water, a never ending tragedy.”
Figure 1. The location of Guayaquil.

‘Thirsty cities’ are a growing problem in Third World contexts (Anton, 1993). The United National Environment Program HABITAT estimates that by the year 2000, 450 million urban residents will be deprived of urban water-supply services worldwide (UNCHS, 1991, page 5). Nevertheless, the complex web of the “Metabolism of the cities” (Wolman, 1965, page 179) surely relies on an incessant flow of water. It is not surprising, therefore, that intense social and political struggles around water characterize Third World urbanization processes.

I seek to document and analyze the historical geography of water control in the context of Guayaquil’s urbanization process in order to unravel the relations of power that are inscribed in the way the urbanization of water and/or nature unfolded. Clearly, the urbanization process itself is predicated upon mastering and engineering the flow of water. The ecological conquest of water is a necessary component for the expansion and growth of the city. The capture, metabolism, and domestication of water require considerable capital. The commodification of water through urbanization inserts the flow of water into the circulation of money and its associated relations of social power. I shall indicate how the urbanization of water and the capital required to build and expand the urban landscape itself are dependent on the political and ecological transformation of both city and countryside. In short, the political and ecological history of Guayaquil’s urbanization process will be written from the perspective of the need to urbanize and domesticate nature’s water and the parallel necessity to push the ecological frontier outward as the city expands. I shall further explore how the circulation of water is embedded in social power relations that operate through and are expressed in the combination of political and ecological processes. Indeed, I maintain throughout the paper that the political, social, and economic can not be separated from the ecological in understanding the urbanization process. Particularly in cities which have a problematic water-supply condition, mechanisms of exclusion from and access to water lay bare how the transformation of nature through urbanization is infused with relations of power.

In sum, I wish to reconstruct and theorize the urbanization process as a process of continuous socioecological and political economic transformation. I shall attempt to do so by means of exploring the circulation, transformation, and appropriation of water as a flow of social power. In this way, I intend to show (1) that the urban is
an integral part of the transformation of nature—the city becomes ‘nature’s metropolis’ (Cronon, 1991); (2) how the urbanization process operates through the application of socioeconomic and political power in which nature and its transformation take centre stage; and (3) how the urbanization of water is predicated upon profound social and ecological transformation of the countryside. In short, both city and country are ‘second nature’ (Lefebvre, 1974; Smith, 1984).

The making of the Guayaquileño bourgeoisie and the first urbanization of water
The origins of commodified watering of the city
Until the mid-19th century, Guayaquil was just a large port village surviving in the shadow of the political centre of Quito and the economically dominant Sierra hacenderos. Until 1700, the supply of potable water for the approximately 5000 residents of Guayaquil was secured by wells dug at the foot of the nearby Cerro Santa Ana. Later, this source had to be complemented by commercialized water transported from the Daule river (Estrada, 1974). Professional indigenous ‘Aguateros’ (or water vendors) transported the water by rafts, and mules carried the barreled water around town (Estrada, 1972, page 50; Vásquez, 1988). Speculative water politics were quite common, ranging from cartel formation to selling (more salinated) water captured downstream. From the beginning of last century water vending became a very lucrative business. The considerable returns of water businesses also changed the ethnic composition of Guayaquil, as the water economy became increasingly controlled by mestizos (local people who see themselves as being from mixed descent) or whites.

The spreading commodification of water resulted in a social stratification of water consumption as access to water depended increasingly on the ability of people to pay (Pérez-Pimentel, 1987). Estrada (1972) notes how access to water became socially highly stratified:

"Para calmar la sed de los ricos tomaban sangria; la clase media agua del Daule; y los pobres ... agua 'desabrida al gusto', de los pozos de la ciudad vieja o del Rio ... decantada en una olla o filtrada a través de grandes piedras."

At the end of the 19th century, the first studies to equip the city with a circulating running water network were undertaken and the contest for the control over and domestication of water intensified (Manrique, 1940). Between 1823 and 1884 several attempts were made to start large water projects, which, nevertheless, all failed because of a combination of systematic rejection of national support on the one hand and the absence of local interest and financing on the other. This suggests that, at the time, Guayaquil’s elites lacked both financial power and political influence at the national level. In 1880, for example, the local authorities contracted a team of engineers to build the first waterworks. Their attempt failed, as local investors did not show much interest in participating in the planned “Empresa de agua potable”. In 1884, then, at the height of the cocoa boom, a public tender was issued to initiate waterworks and canalization works. The financing of the project, which was eventually started in 1887, was secured through a loan from the local Banco de Crédito e Hipotecario after the local authority had agreed to buy a plot of inundated and marshy land owned by the bank. That land at the time did not yield any rent (but would after 1945 become part of the invaded settlement of Surburbio) (Pérez-Pimentel, 1987, pages 120–121; Rojas and

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(2) From the site where the treatment station of La Toma is currently located, 25 km upstream from the city (see figure 2).

(3) The local name for these water vendors is ‘mitayos’ (Pérez-Pimentel, 1987, page 116).

(4) “To satisfy the thirst of the rich, they drank sangria; the middle classes drank water from the Daule river; and the poor ... drank insalubrious water from the sources of the old city or from the River ... decanted in a kettle or filtered through large stones.”
Villavicencio, 1988; Villavicencio, 1992). The deal allowed the bank to cash in on the then worthless land and to use the generated rent to finance the waterworks.

The water project was executed by a French company employing mostly European engineers. On 6 July 1892 the reservoir on the Cerro del Carmen was inaugurated and filled with water piped from a captation point on the Agua Clara river 88 km east of the city (see insert on figure 2). By 30 January 1893, the first 150 houses could enjoy the luxury of domesticated water. Very soon thereafter, lavatory import businesses were set up and flourished, despite the fact that waste water still had to be collected in buckets or was allowed to flow freely over the patio to be absorbed by the ground. Toilets and indoor plumbing became valued symbols of cultural capital. ‘Sanitized’ houses were visited by the poor so that they could marvel at the imported and finely decorated porcelain or tiled artefacts for bodily hygiene and cleansing (Pérez-Pimentel, 1987, page 123). Both city and body joined the conquest for a sanitized, hygienic, and deodorized being. Status, gender, and power became reflected by the odours of the body. The domestication and commodification of water, and the associated stratified and exclusionary water practices, introduced urban water control and use directly into the realm of social differentiation. Because it marked and consolidated relations of power and demarcated social positions, the stratified

Figure 2. The water supply system in Guayaquil.
and exclusionary water practices brought water appropriation even more to the foreground. Whereas the white rich would defecate in the sometimes silver bowl of the toilet, comforted by the privacy of their custom-made decorated lavatories, and perfumed men and women would promenade along the waterside boulevard and visit the theatre, the poor continued to use the streets as a public toilet, and the river provided for essential bodily hygiene of the indigenas and mestizos.

Domesticating water: a double ecological conquest
The mobilization of the city and the state, at the turn of the century, around a growing preoccupation with the water-urbanization process paralleled a changing sociospatial class position and a reconfiguration of the state apparatus. After independence (1830) and, in particular, from 1850 onwards, the early postcolonial society underwent significant sociospatial changes, as Ecuador gradually transformed into an agroexport economy. The agroexport-based Ecuadorian accumulation model originates with the expansion of world demand and trade for cocoa around 1860. By 1890, cocoa alone accounted for 90% of total exports and, in 1904, Ecuador became the number one producer of cocoa in the world (Aguirre, 1984; Chiriboga, 1980, page 261). The old coastal ecological complex had given way to immense cocoa plantations. Twenty families controlled 70% of the land (Chiriboga, 1988, page 64). The forced formation of a wage-dependent class combined with a decomposition of the peasantry fed not only the growing demand for wage labour in the coastal plantations but also for auxiliary waged functions in the city. Between 1896 and 1909 Guayaquil grew 2.5% annually (Rojas and Villavicencio, 1988, page 22) (see table 1).

Table 1. Population evolution in Guayaquil, 1500–1990.

| Year | Total | Source |
|------|-------|--------|
| 1537 | 150   | (1)    |
| 1571 | 320   | (3)    |
| 1587 | 786   | (2)    |
| 1605 | 1100  | (4)    |
| 1620 | 2000  | (3)    |
| 1678 | 6000  | (3)    |
| 1693 | 5000  | (1)    |
| 1734 | 11000 | (1)    |
| 1793 | 8000  | (3)    |
| 1805 | 14000 | (1)    |
| 1814 | 15000 | (1)    |
| 1820 | 20000 | (1)    |
| 1857 | 25000 | (1)    |
| 1875 | 26000 | (2)    |
| 1979–82 | 31972 | (2)  |
| 1880 | 36000 | (1)    |
| 1890 | 44792 | (2)    |
| 1895 | 55000 | (2)    |
| 1896 | 58000 | (1)    |
| 1905 | 81650 | (2)    |
| 1919 | 91842 | (2)    |
| 1920 | 100000| (1)    |
| 1930 | 116047| (6)    |
| 1935 | 135190| (6)    |
| 1944 | 200000| (6)    |
| 1950 | 258966| (5)    |
| 1962 | 510804| (5)    |
| 1974 | 823219| (5)    |
| 1982 | 1199344| (5) |
| 1985 | 1469353| (7) |
| 1990 | 1655592| (5) |

Sources: (1) Chávez, 1944; (2) Hidalgo, 1932; (3) Estrada, 1972; (4) Hamerly, 1973; (5) INEC, census 1950; 1962; 1974; 1982; 1990; (6) PREDAM, 1976; (7) Rojas and Villavicencio, 1988, pages 181–182.

Note: data for 1990 combine Guayaquil and Duran.

The rents extracted from immigrating workers, who transformed nature’s ecology into cocoa-based second nature, were shared by the local comprador bourgeoisie (landowners, merchants, and financiers) and mainly European cocoa importers (Allou, 1987, page 25). The circulation of cocoa money as land and commercial rent resulted in the rise of a Guayaquileño merchant bourgeoisie, the increased monetization of everyday life and its social relations, and the economic affirmation
and later political consolidation of the position of the city (Bock, 1988; Chiriboga, 1988). Newly established banks ploughed the cocoa rents back into the circulation of money. In 1868, the Banco del Ecuador (later Banco de Guayaquil) was established. The Banco de Crédito e Hipotecario, set up in 1872, issued bonds to finance the engineering works for the Guayaquil Water Company (Bock, 1988, page 28). In 1895, the Banco Agrícola y Comercial was founded by the Banking–Agro–Exporter group (Carrión, 1991). The concentration of cocoa rents in the financial sector, and the subsequent loans made to the national government, gave the local bourgeoisie a strong leverage on the national state (Allou, 1987; Moncayo, 1974, page 113). The rentier bourgeoisie also began to control the ‘hegemonic urban institutions’ such as La Junta de Beneficiencia, La Cámara de Comercio, the clubs, the masonic societies, the newspapers, and even some schools (Quintero, 1980, pages 85–86).

The rise of the emergent Guayaquileño metropolis was, indeed, predicated upon the transformation of nature and the integration of a new cocoa-based agricultural ecology in the process of production and rent extraction. The rural and urban were both restructured through this socioecological conquest, which inserted the coastal region squarely in a worldwide money-circulation process and produced the city as the nexus for rent appropriation and distribution. At the same time, the map of political power was redrawn in new ways. The coastal bourgeoisie increasingly challenged the hegemony of the Serrano landed ‘aristocracy’ (Guerrero, 1980). Guayaquil’s lead in the ‘Revolución Liberal’ of 1895 would eventually displace the traditional elites from the commanding heights of the national state apparatus. The Guayaquileño elites, now controlling both the local and national state, generated an uncontested urban growth coalition geared at securing and promoting the interests of the city.

From this time onwards, the urbanization of Guayaquil becomes the history of the conflicts and interests of the urban ruling elites, the alliances that will be forged and broken down, and their struggle to control the national state. The fortunes of the urban elite were closely associated with further ecological conquest and transformation on the countryside and the position of the city in the increasingly globally organized circulation of money and capital. A process of rapid urban development through the accumulation, investment, and consumption of the rents and riches from cocoa production was initiated (Carrión, 1986; del Campo, 1980, page 370). The form, ideology, and aesthetics of this new urbanization process were characterized by a dismissal of past forms and materials, the introduction of ‘progressive’ European ideas, and the laicization of urban life, disseminated by the many immigrants (10% by 1910) (Ayala, 1982, page 103) or brought in by the new bourgeoisie which had picked up these ideas on their many travels to the old continent.

Parallel to the rise of the bourgeoisie, the first working-class organizations saw the light of day. The carpenters’ society, for example, was founded in 1896 and went on strike the same year to demand a nine-hour working day. In 1907, a major strike of the railroad workers paralyzed the city (Allou, 1987, page 28). As the city grew (see table 1), sanitary and physical conditions deteriorated, and the increasing demand for wage workers put a premium on low reproduction costs and relative social peace. The provision of a low-cost collective consumption infrastructure (housing, transportation, schooling, and urban services) fitted the double purpose of keeping the wage bill down and diverting social stress. In addition, the collective nature of such infrastructure and the often externalized returns of urban services pointed at the state as the preferred

(5) See also the descriptions by Wolf (1892) and Enock (1914).

(6) The relationship between the rise of the Guayaquileño bourgeoisie and the changing city architecture and accompanying aesthetic views are detailed in an excellent study by Bock (1988) (see also Godard, 1988). For a similar study of Buenos Aires, see Johns (1992; 1993).
body to initiate, organize, and control such ventures. In 1896, Eloy Alfaro, uncontested leader of the liberal revolution and first president of coastal descent, decided to create the ‘Junta de Canalización de Guayaquil y Proveedora del Agua Potable de Guayaquil’ and, in 1900, declared the urban water project and other sanitary infrastructure as a work of national importance, financed largely by the national state on the basis of taxes on the cocoa trade. In 1905, another special cocoa-export tax was levied to finance the further sanitation of the city. Between that time and the 1920s, the water network was gradually extended (Villavicencio et al, 1988). In addition to urban water projects, road pavement, public building construction, and railroad lines were major achievements of the ruling growth coalition of the city (Rodriguez, 1987). By the turn of the century, the level of urbanization and domestication of water in Guayaquil outpaced the sanitation of many European towns of similar size (Goubert, 1989).

From the early years of the water system, charges were differentiated on the basis of the activities in the building and their estimated water consumption. The diameter of the water pipe served as the main accounting unit. A form of progressive pricing policy was introduced, as people in rented accommodation paid less than homeowners. Public institutions (offices, hospitals, schools, etc) received water free of charge. The water price structure was indicative of relative power positions within the city, as merchant activities paid less than industrial ones, whereas the redistributive element highlighted the preoccupation with the relative well-being of poorer urban residents.

However, although Guayaquil prospered for the upper classes during this period and revelled in its new leadership role (Martinez, 1988), the seeds of the subsequent disintegration soon germinated. In fact, from the second decade onwards, a moment when population growth outstripped the expansion of the water network and the hegemonic power of the local elites began to show its first internal fractures, private water vending again became an accepted part of daily life. From this time onwards, however, private water sellers bought water from the public utility for distribution and sale in areas which lacked basic water infrastructure. The officially charged price to water vendors was very low, permitting them a quite considerable extraction of monopoly rents.

Faced with a growing mismatch between supply and demand, the municipality contracted work to increase the water-production and water-conduction capacity from the Agua Clara source to 13 000 m³ per day, sufficient to provide a city of 150 000 inhabitants with an average of 100 litres per person per day (Gaceta Municipal November 1910, page 167; 21 February 1911). However, a local inspection team visiting the catchment site in 1916 reported a physical water loss of 50%, and the pipeline to Guayaquil showed serious problems (Gaceta Municipal 20 March 1916).

The interest on and repayment of the loans raised to cover project costs were paid by a combination of local land taxes, the sale of water, and taxes on imports and cocoa exports. This mechanism shows that the financing of the water-urbanization projects was by no means self-supporting and was largely dependent on the vitality of the import–export sector and the continuation of an accumulation process based on land or commercial rent extraction. It suggests that investment costs cannot be recuperated from water sale alone, which indicates that there is a substantial gap between the cost of water and the price to the consumer. Indeed, from the very beginning (and until this very day), the water engineering works were dependent on external financial sources (and, therefore, closely related to the capacity of the Ecuadorian economy to generate foreign currencies via export promotion) to expand the system, and on a combination of loans and subsidies to cover operational costs (Swyngedouw, 1995b).

Gaceta Municipal, Ordenanza sobre Agua Potable, Revista Municipal, and Registro Oficial are all official publications of the Local Government of Guayaquil; copies are available from the author.
In any case, the city, at least partially washed with water streaming through its veins, cleansing its burghers, and portraying an image of health, beauty, and prosperity, faced its first major water crisis towards the end of the first decade of this century. The commodification of water and its acculturized and urbanized character gave water nevertheless an increasingly prominent place in maintaining the urban social fabric. Yet, although the city could not survive any longer without being perpetually washed with an incessant flow of water, the process of centralized water provision that had started to unfold began to slow down at a time that the city itself expanded.

Moving the water frontier: the emergence of exclusionary water practices in an age of reformulation

Expanding the waterfront

It soon became evident that the current catchment would not be sufficient to guarantee a sufficient supply of water to match the pace of the water-urbanization process. In 1924, for example, the city received water only during two to three hours a day, usually between 6.30 AM and 9.30 AM (Manrique, 1940). Nevertheless, the Agua Clara river remained the city's main source of water (of questionable quality) until 1928 (Acevedo, 1938). If the domestication of water were to follow the expansion of the urban frontier the water frontier needed to be pushed outward in search of new exploitable water reserves. The growth of the city could only be sustained first by moving nature's frontier and then by incorporating ever larger parts of nature's geography into the circulation of money and profit upon which the city's continuing prominence depended so crucially.

By 1914–15 already, the London-based J G White and Co. undertook a series of technical and economic studies, which resulted in the presentation in 1916 of a plan for the provision of water to Guayaquil, based on the capture of mountain water from the Eastern Andes cordillero(8), and a sewage system. The plan projected a system that by 1926 would produce 20,000 m$^3$ per day for a population of 117,000 inhabitants; at which time, the system would need to be upgraded to produce 30,000 m$^3$ per day, which should be sufficient until 1936. After 1936, the capacity needed to be increased to 40,000 m$^3$ per day. On 5 January 1919, the national government contracted the White company to implement the proposed system. Only a few months later, the local authorities took over the contract from the national government. In 1923, the “Junta Especial de Saneamiento” was created to execute public works of canalization, potable-water provision, sewage, and roadworks. The Junta was financed by local taxes which were nationally collected and then devolved. The government also allowed the municipality to contract (foreign) loans to finance the project.

In 1928 a new production and conduction system, known as ‘La Lolita’, was inaugurated with a capacity of 20,000 m$^3$ per day destined for Guayaquil and the surrounding region (see insert on figure 2). In 1933, the average daily supply of water was 170 litres per person per day. From that time, water was charged on the basis of either metered water consumption or on the basis of cadastral evaluation of the property (Ordenanza sobre Agua Potable 1933). Between 1928 and 1932, the city with now 117,000 inhabitants and almost 8000 dwellings, enjoyed a twenty-four hour supply of water; a unique achievement in the context of Latin America and something Guayaquil would never accomplish again. It was also during that period that yellow fever virtually disappeared (González, 1988).

However, this successful watering of the city was short lived. Very soon thereafter, the water urbanization process slowed down dramatically, as the political power relationships began to shift in decisive new ways, particularly after the crumbling of

(8) The project basically proposed to expand the capacity of the existing system.
the cocoa economy. Indeed, by the end of the 1930s, the highly successful and
hegemonic bourgeois growth coalition that had launched Guayaquil on the path of
dependent modernization (while the Sierra had relatively stagnated) had dwindled.
From the beginning of the second decade of this century, the collapse of the cocoa
boom began to plunge society into a great crisis. This collapse also produced the first
Cracks in the hitherto firmly allied elite alliance of cocoa producers, merchants, and
financiers. This downturn\(^{(9)}\)—which at its height had stalled the possibility of other
capital fractions rising to the challenge of the ‘cacaoteros’ in any serious way—left
a vacuum which could not be filled easily. Consequently, as tensions between the
various local elite fractions intensified, the hegemony of the bourgeoisie was increas­
ingly challenged from within. For example, in 1917–1918, a few members of the
import bourgeoisie founded the Banco la Previsora, which focused its activities on
real estate credit and became part of a nascent alliance of real estate developers and
the construction industry (Guerrero 1980, page 197). The limited internal buying
capacity of the masses, however, ruled out the possibility of an upturn on the basis
of an emergent national bourgeoisie. This first crack in urban hegemony was soon
followed by other strategies that were employed by elite fractions in order to maintain
their eroding position. Urban landowners, for example, subdivided inner-city houses
(tugurización) and rented them to inswarming immigrants in a desperate attempt to
maintain the accumulation process (Rojas and Villavicencio, 1988) by shifting capital
into other circuits of circulation (Harvey, 1978). Internal cohesion was further under­
dmined when the financial elites delinked the sucre from the gold standard in 1914,
which resulted in inflation and devaluation which negatively affected the position of
the importers. The cocoa producers, the weakest link in the alliance anyway, were
almost completely destroyed by the collapse of the market. In short, the diverse
fractions that comprised the urban bourgeoisie began to pursue their own specific
interests (housing, land development, or financial speculation) in a desperate attempt
to displace immanent devaluationary pressures onto other groups. The earlier growth
coalition broke down and became rift with internal tensions and conflict. The Sierra
landowners, together with the textile industrialists (the Sierra’s main manufacturing
sector) seized the opportunity and began to challenge Guayaquil’s control over the
state (Cueva, 1990; Moreano, 1975; Vera, 1948).

But the hegemony of the Guayaquileno bourgeoisie was equally challenged by
the emergent local petty bourgeoisie and the growing militancy of organized labour.
Already in 1905, the Confederación Obrera Provincial de Guayas was formed as a
regional labour umbrella organization. In 1908, the first exclusively wage-workers­
based union was formed in the city (Sociedad Cosmopolita de Cacahueros Tomás
Briones), which declared a strike in that year and again in 1916. After years of

\(^{(9)}\) Between 1917 and 1926, cocoa output fell by 45% from 1 008 000 million quintals to just
447 000 (Bock, 1988, page 60). The socioecological opening up of Africa for cocoa production,
the phytosanitary problems resulting from monocultural practices, and the dwindling demand
for cocoa from Europe during the First World War affected prices, productivity, and production.
For example, cocoa prices fell by 50% between January and September 1914 alone (Martinez,
1988, page 18). The breakdown of the world economy after the war further eroded prices. For
example, between March 1920 and June 1921, the cocoa price on the New York commodities
exchange plummeted from 25.75 cents a pound to 5.75. The amount of cocoa exports fell by
21% compared with that in 1917. The subsequent dollar shortage hiked up the dollar price
and cocoa exporters could recapture some of the lost ground as a result of the increasing exchange
rate of the US dollar (from 2.11 sucre in 1920 to an average of 4.2 in 1922). This, in turn,
put the import sector in serious difficulties (Martinez, 1988, page 19) and resulted in monetary
chaos (Marchán, 1991). As I will document further, the urbanization of water and the structure
of ecological processes in Guayaquil is sociospatially related to the fluctuations on the New
York commodities exchange and the vagaries of the international monetary system.
economic decline and growing austerity, a citywide general strike was launched in November 1922, which paralyzed the city completely for days. The waterworks were closed down and the city virtually died of thirst. On the orders of the state the strike was finally brutally and bloodily repressed by the army (Martinez, 1988; Robelino, 1976). The bloodshed ended with several hundred butchered corpses floating down the Guayas river (Durán, 1988).

Guayaquil's hegemony unraveled
The 'Revolución Juliana' of 1925 delivered a fatal blow to the control of the Guayaquileno elites over the state. The political tide turned more (but not exclusively) in favour of Quito, as the Sierra landowners reclaimed their influence (Allou, 1987, page 29; Godard, 1987, page 113; Marchán, 1991, page 48). However, Ecuador would never again experience a similar hegemonic elite control than it did in the era of the cocoa boom. The sociospatial diversification of both agricultural and manufacturing production contributed to the ongoing struggles between Costa and Sierra as well as between their internally divided ruling classes (Maiguashca and North, 1991, page 109). The subsequent period was, indeed, characterized by political instability. No fewer than seventeen governments succeeded each other during the 1930s (Cueva, 1991; Deler, 1981). This instability further eroded cohesion in civil society and, not surprisingly, resulted in growing calls for federalism and regional independence, particularly in Guayaquil, where the weakened bourgeoisie considered regional independence to be a means to restore some of its lost hegemonic position over the national state (Quintero and Silva, 1991). In 1933, Velasquez Ibarra won the elections (something he repeated four more times), which announced the beginning of Ecuador's subsequent populist tradition (Egas, 1992; Menendez-Carrion, 1986). Combined with a more regionalist outlook from at least some fractions of the Guayaquileño bourgeoisie, the subsequent geopolitical dynamics led to more complex and tenuous relationships between the national and local state (Maiguashca, 1992).

As its parasitic unity with agricultural export production weakened, the city began to stagnate economically. Nurse (1989, page 101) summarizes it as follows: "With the collapse of the cocoa boom came the abandonment of many of the spectacular public works projects undertaken in the years of plenty. Also abandoned were many of the plantations themselves, with the owners acquiescing in their takeover by the former plantation workers at low rents or rent-free."

This loss of power for Guayaquil's ruling classes was paralleled by a slowdown of the water-urbanization process. The capital for extending the system never came forward despite desperate appeals of the local government to the national state for assistance (Revista Municipal 1936, page 52). As the control of the local elites over the national state weakened, cocoa rents earmarked to finance sanitary works in Guayaquil were diverted increasingly to other purposes and places.

A 1943 memorandum of the Cantonal Council of Guayaquil to the National Congress detailed the history of appropriation and allocation of cocoa rents which were originally destined for Guayaquil's waterworks (Revista Municipal 1943). In 1923, the National Accounting Tribunal (Tribunal de Cuentas) certified that, of a total of thirty-two million sucres of cocoa rents collected between 1899 and 1923, only four million were actually spent. In 1923 a new provincial 'Junta Especial de Saneamiento' was established, which undertook to sanitize the city further. The National Congress budgeted an annual amount of three million sucres for that purpose. In the subsequent years, only six million was spent on improving the water-supply system. In 1926, J G White and Co. delivered plans for road and sewage works to the Junta. In 1927,

(10) See Quintero (1991) for a review.
however, the government replaced the provincial ‘Junta Especial de Saneamiento’ with a nationally appointed ‘Jefe de Fiscalización’ to oversee the works. The contract with J G White and Co was taken over by the state and eventually rescinded, leaving the sanitation works unfinished. This shows how the geopolitics of the country had changed to the detriment of Guayaquil. With the disappearance of the ‘Junta Especial de Saneamiento’, the city lost the power to control its economic resources and the capacity to invest them in local infrastructure. The ten million sucres available in the national ‘Caja Fiscal’ for urban sanitation projects in Guayaquil were spent on other projects by the reformist dictatorial juntas of that time. After the liquidation of the J G White contract, a satellite section within the Ministry of Public Works was established under the heading of ‘Saneamiento de Guayaquil’. This section controlled an annual budget of between 600,000 and 800,000 sucres. Until 1943, the money was in fact spent mostly on public works throughout the country. In 1929, the National Assembly authorized the Executive Power to borrow the equivalent of US $2 million for the implementation of sanitary works in Guayaquil. In 1943 (sic!) the Cantonal Council demanded the execution of the decree. In sum, between 1899 and 1943, the national state received a total of 86 million sucres from Guayaquil’s cocoa rents, though only 16 million was actually spent on the waterworks. The total national debt to the city was estimated to be 76 million sucres. Few, if any, of the commitments made by the national state after 1923 with respect to the sanitization of the city were actually honoured.

**Drowning in water and starving from thirst; the making of the urban water crisis**

From 1932 onwards, the flow of water became increasingly irregular and thinner, falling from an average of 20 hours a day to 14 hours in 1938, 11 hours in 1943, and dwindling to 6–7 hours in 1946. Water needed to be stored in receivers of all kinds to assure a 24-hour supply (*Revista Municipal* 1 February 1938, pages 39–41). Despite several attempts, the two planned expansions to ‘La Lolita’ were never realized, and suggestions to construct a second treatment plant on the Daule river (the site of the current sole water station) also failed to materialize (*Revista Municipal* 1938, pages 39–41). In 1936, a technical commission reported that the system was in need of urgent technical reparations and suffered from damages and water losses as a result of illegal connections and spillage (*Revista Municipal* July and August 1936, pages 29–30, 52). In 1939, the *Revista Municipal* remarked that the quantity of water produced was still at the same level as in 1928, although the number of urban residents had risen to about 200,000. La Lolita, which would remain the single water-sourcing system until 1951, produced 20,000 to 30,000 m$^3$ of potable water each day, but also supplied water to the towns and villages adjacent to the main conduction pipe. By 1944 no more than 10,000 m$^3$ actually reached the city for further distribution (Olaya and Villavicencio, 1990). The average daily per capita production dropped from about 180 litres in 1930 to fewer than 100 litres in 1945. The city in the meantime had begun to experience rapid growth (182% between 1925 and 1950), characterized by tugurización and the emergence of the first land invasions, mainly in the tidally inundated mangrove forests of the Guayas estuary (Godard, 1988). The slowdown in infrastructure provision resulted in the reappearance of slums, a growing number of private water vendors, and the accompanying monopoly and exclusionary water practices. The problematic access to water, combined with an intermittent flow, increased the danger for contamination, and bacteriological pollution became again a serious threat. In 1938, new cases of yellow fever were reported (*Revista Municipal* 1938, pages 39–41).

The urban distribution system covered only the old, densely populated, centre of the city. With the exception of a few new connections in four more streets in
1946/47, the 1929 system had not been extended. In 1946, still only 8600 dwellings enjoyed the luxury of indoor water (mostly without meters) (Buck, Seifert and Just, Consulting Engineers, 1947). While the existence of connections did not in any way suggest that water was available, there were still more than 110,000 people (55%) who had to make do without domestic supply at all (based on a generously estimated average of ten persons per household). About 47.5% of the water was lost through leakage and physical damages (Villavicencio, 1990).

The sociospatially stratified water supply was also cemented into the water-engineering system itself. Each of the reservoirs on the Santa Ana hill covered part of the city independently. No bypass system existed, which led to regular interruptions in water distribution each time the reservoir or its mains needed repair or maintenance. The network was organized as a fish-bone system. Close to the feeding station, water supply was fairly regular and of reasonable quality. Further down the network, pressure fell rapidly and both availability and quality deteriorated quickly to become just a trickle of smelly water at the margins of the system. The water network corresponded closely to the geography of urban land rents which were, in turn, reinforced through the spatial inequality organized in and through the technological and engineering structure of the water system. The social geography of the city mirrored the structure of the water network and the level and quality of water delivery.

Production and supply were organized institutionally through a municipal public utility controlled by the Departamento de Agua Potable. The water price was set far below real cost. Whereas the middle and upper classes received highly subsidized water, the poor were deprived of it. The structural financial deficit that resulted jeopardized adequate maintenance and upgrading of the network and made water engineering works inherently dependent on external financing. By the end of the 1940s this process of water urbanization had led to a new and acute water crisis. Private water vending was common and, as the water crisis deepened, continued to increase both in numbers and volume. Urban water struggles became an integral part of the rituals of everyday life (Swyngedouw, 1995a). The respect that visitors still showed for the city's sanitary conditions during the mid-1930s was now just a mere reminder of the past glory of the city elite (Desmarest, 1937, page 54).

Opening up a new waterfront
Water and bananas

The postwar period announced a partial reversal of the city's economic fortunes and a profound reconfiguration of class relations. A myriad of new political parties were established, which expressed the divisions within the ruling elites, the rise of left political parties as a result of growing proletarianization (Maiguashca, 1992, pages 200–201) and, most importantly, the spectacular growth of populist movements. The turbulent but lean years of the 1930s and 1940s were followed by the banana bonanza decade of the 1950s. The US banana corporations, their plantations struck by Panama disease, moved their centre of operations from Central American and Caribbean exporters to Ecuador. The coastal area of the country (the Costa) was converted into large banana plantations (Armstrong and McGee, 1985, page 114; Larrea-Maldonado, 1982, pages 28–34; Schodt, 1987). This manufactured banana boom pushed the agricultural frontier around Guayaquil further outward (León, 1992; Trujillo, 1992), radically altering the ecology of the urban–rural complex and incorporating ever larger areas into a global money flow. Precarious modes of labour

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In 1948, banana export receipts totalled 2.8 million dollars, it reached 21.4 million in 1952 and 88.9 million in 1960, accounting for 62.2% of Ecuador's exports (Cortez, 1992; Grijalva, 1990; Hurtado, 1981, page 190).
utilization and control were gradually abandoned through a series of land and legal reforms. Although actual production was predominantly organized by smallholdings, trade was concentrated in very few hands, combining a tiny national comprador elite with the US fruit-trading companies (Baez, 1985). This banana colonization prompted mass migration to the Costa and to Guayaquil. Between 1950 and 1974, the city's banana-dependent financial and service economy expanded rapidly (Carrión, 1992), while its population grew from 200,000 to more than 820,000.

Banana rents were ploughed back—either directly or indirectly through the state—into the urban realm (Baez, 1992). The backbone of Guayaquil's accelerated urbanization during this period lay entirely in the expanded and reworked ecological conquest of the coastal region, itself directly related to the expansion of metropolitan and global agrobusiness capital. This growth improved Ecuador's credibility and, combined with the efforts of the newly established international financing organizations, foreign capital began to flow again into Ecuador. The national state remained fairly weak and regionalist, or populist struggles dominated the political arena, which suggested a symptomatic absence of a more or less hegemonic national elite programme (Conaghan and Espinal, 1990). This maelstrom, and rich texture of economic, political, and ecological transformations, provided the ferment from which the postwar extension of the urban water frontier to new and hitherto not exploited water reserves would emerge.

On 31 October 1945, the Municipality of Guayaquil signed an agreement with a consortium of US companies for the planning, execution, and supervision of the works for a new potabilization plant for the city. The national government authorized the Municipality to borrow US$4 million from the US Export–Import Bank to finance the project (Registro Official number 147, 8 January, 1946). One year later a consultancy firm was commissioned to undertake a comprehensive water-planning study. The results and project proposals were handed over to the municipal authorities in August 1947. The Daule river surfaced again as the next target to divert, transform, and commodify. Banana-export earnings, combined with a reverse flow of money from the USA, were welded together with the flow of Daule water to circulate through the veins of the city. Once more, the city would be transformed and the political economy of the urbanization process would be deeply caught up with the progress of the urbanization of water.

In 1950, the construction of the new potabilization station 'La Toma' was initiated and it became operational in 1951. The station captures water from the Daule river, 26 km upstream from Guayaquil. In addition, a main conduction pipe was constructed which led to a new reservoir at Tres Cerritos in Urdesa, west of the city centre (see figure 2). This main also serves as a distribution pipe for industries and neighbourhoods located on its trajectory. La Toma had a maximum daily capacity of 75,000 m³ and was designed to serve a predicted maximum population of 440,000 people by 1980. The geographical landscape of the city would be reshaped by this upgraded circulation of water. The area where the new water reservoir was built would a few years later become the middle-class and upper-class residential part of the city. Indeed, formal urban development and feverish land speculation closely followed the flow of water. Banana rents were, among others, recycled through the Guayaquileno financial system in the promotion of urban development and housing projects. This became a prime source of accumulation for a growing construction industry (Villavicencio, 1990, page 33).

However, the banana bonanza, combined with the modernizing politics of the national state, propelled migration flows to new heights. Already in 1957, the city counted 403,000 people. Only a few years after its inauguration, the new potabilization station was already operating at its anticipated full capacity and, once again, the
population began to suffer from major water shortages and water scarcity (Olaya and Villavicencio, no date). Moreover, the invaded settlements, which, ironically, were built in the mangrove estuary and whose construction demanded a detailed division of labour and quite intricate engineering works to control the tidal flows of marine water, were never serviced. Indeed, as the banana boom drew to an early close toward the end of the 1950s, the further conquest and urban mastering of water reached an impasse.

The closure of the frontier and the emergence of an ideology of water scarcity

In the 1950s, a new and more resistant banana variety, the Cavendish, was developed. This development allowed the fruit companies to switch their operations back to the more favourably located Central American plantations. This bioengineered and technologically more demanding 'Chiquita' banana (León, 1992) was heavily commercialized internationally and undermined the position of the traditional Ecuadorian 'Gross Mitchel' variety. Only large Ecuadorian producers who were connected to the international merchants were able to adjust ecologically and socioeconomically to the requirements of the new production and marketing techniques. By the early 1960s the production volume was twice the exported volume. Returns began to decline or, at least, their growth began to slow down (Tobar, 1992, page 238). Thousends of small and medium sized producers were wiped out and joined the ranks of the urban underclass (Báez, 1985, page 554).

The banana decline resulted in a partial shift of capital into new areas, in particular the urban environment through land speculation and development. The state, in turn, was pushed to face the falling export position of Ecuador. External debt rose rapidly in the midst of stagnating export revenues. Taxation increased and, in order to appease the merchant elite, the currency was devalued from 15 to 18 sucres per dollar in 1961. The collapse of the banana-based agroexport model caused living conditions to deteriorate significantly. The elites might have lost some of their privileges, but the poor were faced with carrying the brunt of the devaluation process that swept the country. Social unrest was the inevitable outcome. On 2 and 3 June 1959 the people of Guayaquil took to the streets to protest at this attack on their livelihood. Once more, this popular revolt ended with bloodshed, as the called-in army killed more than 500 people in the city (Muñoz Vicuña and Vicuña Izquierdo, 1978; Ycaza, 1992, page 556). In 1961 another series of popular rebellions erupted. The disarray in which both the state and the economic elites were embroiled gave rise to the rapid growth of local populist parties and, from 1963 onwards, the seizure of power by the military. Needless to say, this crisis arrested the further modernization of the city exactly at a time when the urban water crisis became more acute.

The social unrest and the rising deficit of urban public services forced the state to consider the problems of collective consumption in the marginal areas of the city. A new strategy of urban domination became increasingly apparent. The spontaneous social mobilization of that time was channeled and controlled through a personalized clientelist urban-political system aimed at the partial satisfaction of popular demand for key services. The now more consolidated invasions not only represented a growing base for mustering political support, but their better organization enabled negotiations between the local state and the neighbourhoods. These negotiations, in turn, strengthened populist—clientelist relations and resulted in a further development of the urban water system, which was piecemeal, ad hoc, and based on personal favours (Menéndez-Carrión, 1991).

(12) Banana export value fell to $51.5 million in 1965, only to recover by 1970 ($94.3 million) (Tobar, 1992, page 238).
The government had become extremely worried by the continuing problems of water supply and its potentially dangerous effects on social stability. Through an Emergency Decree of 12 June 1959, just a few days after the massacre of the protesting masses, the national government created the ‘Junta Cantonal de Agua Potable de Guayaquil’ as a formally independent and autonomous organization. This new institution replaced the municipal ‘Departamento de Agua Potable’ which had hitherto been in charge of urbanizing water. The official policy was to keep on insisting for a supply system that provided every household with unlimited quantities of water (Registro Oficial 1959). In fact, upholding such a view as official allowed the organization (and still does) to contain a series of increasingly sharp contradictions. First, by its promise of a solution in the near future, it appeased those that were hitherto excluded from access to water. Second, it did not threaten those who already enjoyed cheap access to unlimited quantities of water. Third, the piecemeal improvements suggested that clientelist strategies worked and reinforced the hold of the populist parties over the urban underclass. Fourth, the problem of systemic water shortage was attributed to technical and natural constraints. This politically produced ideology and practice of water scarcity defused potential sociopolitical unrest over the water issue as, in the end, it was nature’s fault!

In 1960, the new water company (Junta Cantonal de Agua Potable de Guayaquil) opened a tender for the First Master Plan for the future provision of water. SEURECA, a French engineering consultancy firm, started working on the plan in 1961 (Olaya and Villavicencio, 1990). In 1962, the ‘Ley Constitutiva de la Junta de Agua Potable’ became de facto an independent, but publicly owned, company. Its objective was to serve the public. This allowed the company to negotiate loans directly with international organizations and to contract works. The exercise was also inspired by an attempt to take water provision out of the clientelist hands of the local authorities. However, declining banana rents made loans more difficult to come by, and debt servicing became more problematic. In 1963, La Toma’s production capacity was increased to 93,750 m$^3$ per day. In 1968, a second main was built between La Toma and the city, with a conduction capacity of 144,000 m$^3$ per day. These works were financed with loans and a variety of taxes, on hotels and again on imports and exports among others. In 1970, a Supreme Decree changed the legal position of the water authority once more, which was passed on again to the municipality. This new ‘Empresa Municipal de Agua Potable de Guayaquil’ (EMAP-G) took over from the previous Junta (Calle and Chang, 1976). In addition, the geographical remit of EMAP-G was extended to cover the whole of the Province. In 1971/72, the capacity of La Toma was further increased to 172,500 m$^3$ per day. Nevertheless, these incremental alterations trailed far behind the rapid population growth of the city. By 1974, 63% of the total population and 71% of the urban area had to be supplied by tankers or community taps. The now endemic exclusionary water practices laid the foundation for a thriving private water economy monopolized by water vendors whose exclusive control over a key element of nature enabled the appropriation of considerable water rents. In 1976, these ‘tanqueros’ sold water at 2.5 sucre (US$0.1) for a tank of 200 litres. Each of the 69,315 families living in Suburbio paid on average 55.83 sucre per month for their water or an annual total of over 46 million sucre (US$1.86 million) (Servicios Sociales del Suburbio, 1976).

The last breath of the urban water dream

Petroleum urbanization and the globalization of the money/water nexus

The exploitation of Amazonia’s huge oil reserves from 1972 onwards signalled a new wave of rent extraction and redistribution (Fierro, 1991). The existing sociospatial
and geopolitical relations were once more to be overhauled. The ecological conquest of the underground of the Ecuadorian rainforest was exclusively based on international petrocapital. In contrast to the two earlier waves of agroexport-based integration in the international market place, which were mainly organized through a domestic commercial and financial oligarchy, the intermediating function for the oil economy was taken by the state (Baez, cited in Farrell, 1989, page 146). Domestic appropriation of some of the rents was channeled either through the state or through spillover effects into the financial sector and the construction industry. This placed the state in a key position to organize the international articulation of Ecuador. In addition, the expansion of the ecological rent frontier was this time directed eastwards into the Amazon basin rather than towards the Costa. Once it passes Quito, crude oil, which flows over the Andes on its way to the global market, is transformed into money. Hence, this city became the new financial centre, leaving Guayaquil behind in its past glory.

The oil rents of the state were reinvested with an eye toward domestic industrialization (Bocco, 1987), mainly in all sorts of infrastructure. In 1976/76, for example, 30% of state expenditures (excluding infrastructure, which alone accounted for 55% of the total budget) went to the cities (as well as most of the infrastructure works—Allou, 1987), where the contradictions of the modernization drive were felt most acutely. Furthermore, the oil extraction also attracted international funds, as Western economies suffered from crisis and capital switched to the Third World to recycle their accumulated petrodollars. During the 1970s, Ecuador piled up a massive external debt, in part financed through the return of money originally exported as oil (Acosta, 1990). The urbanization process was once again predicated upon a new political-ecological conquest.

Oil rents also served to extend the ecological basis on which the city’s sustainability is predicated, such as widening the scale and scope of water control. Land occupations were semiofficially organized by the clientelist municipal politics. For example, land in Guayaquil’s mangrove estuary was sold at 10 sucres per m², a value which would be inflated away in the early 1980s as the oil economy collapsed (Godard, 1987). In August 1975, the subfluvial pipe bringing water from La Lolita to the city was closed. The entire city became again dependent on a sole source of water, but oil money was invested to capture more of its water to refresh (parts of) the city. In 1974, in the midst of the oil boom, The World Bank [BIRF (Banco Internacional de Reconstruccion y Fomento)] granted a $24 million loan to EMAP-G. However, few of the water projects covered by the loan will be implemented. The National Development Bank (FONADE, now BEDE) financed the production upgrading of La Toma to a total capacity of 320 000 m³ per day, although the conduction capacity remained the same at 230 000 m³ per day. In 1979, the construction of a third aqueduct from La Toma to the city started. The pipe stopped at Quinto Guayas, 10 km short of reaching the city (see figure 2). The city would have to wait until 1992 before the final 10 km gap was closed and the extra production capacity could reach the central reservoirs. In the meantime, EMAP-G had also constructed a 165 km-long main to connect the Peninsula with the urban reservoirs. In 1982, BIRF evaluated the impact of its loan and wrote a devastating report. It concluded that (1) the administration of EMAP-G was completely unsatisfactory; (2) the project was hugely underfinanced as a result of below cost tarifing, the high percentage of water spillage (45%), and the enormous backlash in accounting (on average six months); and (3) there were extraordinarily high administrative costs because of the growing number of employees (15 per 1000 connections).
In 1978, about 760,000 inhabitants (59,766 connections) had a domestic water supply, and about 550,000 people (42%) were dependent on other means—mainly 'tanqueros'—to access water (EMAP-G, 1980). In that year, EMAP-G signed a contract with the Engineering Consultancy group Gilbert-Brown and Caldwell-Ribadeneira Inc. to undertake the second Master Plan for potable water. This plan, permeated with the idea of the final full completion of the urban water network, would remain the basis of Guayaquil's water politics until this day. By the time the plan was ready, however, the national and international situation was at the eve of great turmoil, as the relatively prosperous decade of the 1970s would give way to the 'lost decade' of the 1980s.

**Oasis and the urban desert: towards institutionalized water chaos**

The 1980s announced a decade of intensifying crisis formation which would plunge Ecuador into one of its most prolonged recessions. The oil price collapsed and the rents from the ecological conquest of the Amazon plummeted. This was followed by a deterioration in the balance of payments while the built-up debt demanded ever rising service payments (Acosta, 1990). The ensuing fiscal crisis took the floor from underneath the state's efforts to modernize the urban fabric. The collapse of the economy accelerated rural-to-urban migration, and the financial flows to equip the cities with the necessary infrastructure became thinner. This spiral of decline was accentuated by the earthquake of 1987 and the devastating effects of El Niño on agricultural rent extraction. The decline produced an urban crisis with catastrophic dimensions: absence of investment, rapid expansion of the city, land invasions, deterioration of urban services, and chaotic management. The economic elites remained basically absent from the political terrain, whereas the urban managerial elites maintained an important power position through the cultivation of deeply entrenched clientelist strategies.

The projects proposed in the 1980 Master Plan did not get started until 1988. By that time the urban condition had disintegrated to such an extent that all initiatives would increasingly run behind the realities of the city's expansion. By the end of the decade, the city was faced with the greatest water crisis in its history (table 2, see over). In 1987, financing contracts were finally signed for a total value of $51 million on loan from the Commonwealth Development Corporation (£4.9 million), the World Bank ($31 million), and internal capital ($12 million). However, in 1989, the World Bank suspended its loan because EMAP-G did not stick to the terms of the contract.

**Table 2. Water accessibility and water provision in the metropolitan area of Guayaquil (city of Guayaquil plus Duran), 1990 (source: Census, 1990).**

| Access       | Houses | Percentage | Inhabitants | Percentage |
|--------------|--------|------------|-------------|------------|
| in-house     | 163183 | 47         | 743978      | 45         |
| outdoor      | 43696  | 13         | 202476      | 12         |
| quarter      | 18887  | 5          | 92129       | 6          |
| no water     | 123369 | 35         | 604624      | 37         |

| Provision    | Houses | Percentage | Inhabitants | Percentage |
|--------------|--------|------------|-------------|------------|
| public network | 219439 | 63         | 1007574     | 61         |
| private vendor | 121257 | 35         | 593731      | 36         |
| other        | 8480   | 2          | 41902       | 3          |
| Sewage connection | 184998 | 53         | 834199      | 51         |
which demanded managerial streamlining and improved operational efficiency. In the meantime, the national state had to intervene with emergency loans to prevent the total collapse of the system and to contain growing social unrest. In 1989, EMAP-G changed again to a provincial organization (EPAP-G) in a desperate attempt to take the water-supply system away from the municipal clientelist political scene and to satisfy the requirements of the World Bank. These frequent institutional reorganizations express and illustrate the web of political urban, regional and national struggles. In the meantime, works had started to expand the water-pumping, treatment and conduction capacity of La Toma: pumping was increased to 800,000 m$^3$ per day and treatment capacity grew from 450,000 m$^3$ per day by the end of 1993. With an estimated loss at source of 20%, the total effective capacity was brought to 512,000 m$^3$ per day. In 1992, the conduction capacity was increased to 640,000 m$^3$ per day. An upgrade and expansion of the network is anticipated in the city centre and in parts of the most recent invasion settlements. However, there is no solution in sight for the massive distribution problem. The investment needed to achieve full coverage is estimated at around $40 million. Meanwhile, however, a new white elephant is being planned and built. A new potabilization plant, adjacent to the old one, is currently under construction for a price tag of $75 million on loan from the Spanish government. The total capacity of the new plant is estimated at 864,000 m$^3$ per day. This will indeed improve the hours of servicing for those parts of the urban population who have domestic connections, but will once more leave the excluded at the mercy of the water speculators. Indeed, in 1993, the 600,000 people dependent on 'tanqueros' paid an estimated $9.5 million to the private water vendors. The vendors, in fact, use their control over a vital commodity to consolidate their position of power.

**Conclusion: Whose Water? Whose nature? Whose city?**

The city of Guayaquil grew on the basis of successive ecological conquests and the appropriation of rents from agricultural produce or the pumping of oil through which money was continuously recycled and nature became urbanized. This was paralleled by the harnessing and urbanization of water, which inserted the circulation of water squarely into the circulation of money and its associated power relations and class differentiation. The production of new urban landscapes of power and the seizure of the realized rents from land development was predicated upon the extraction first of cocoa rents, then banana rents, and, finally, oil. Each time, social power relationships were restructured through combined political (and) ecological changes. The flow of water, combined with and running through physical and social urban space, represents just one node in an articulated whole of processes operative on a regional, national, and, indeed, worldwide scale: flows of transformed nature, commodities and money, transfers of capital, buying and selling of labour power, etc.

From the very beginning, the urbanization of water became subject to intense social struggles, as the dialectic of exclusion from and access to commodified urban services unfolded. The now endemic exclusionary water practices lay the foundation for a thriving private water economy, monopolized by water vendors whose exclusive control over a key element of nature permits the appropriation of considerable water rents. In other words, the transformation of nature is part and parcel of the power relations through which the urbanization process unfolds.

In sum, nature and society are brought together to form an urban political ecology that combines the political and socioeconomic with the ecological in ways that make them inseparable. Urbanization, therefore, is a process infused with relations of social power, and proceeds through multiple forms of sociospatial struggle in which (transformed) nature takes centre stage. In the end, the urban water issue is part and
parcel of a much wider consideration of the environmental basis of the city's existence and change. The city is a giant social process of perpetual transformation of nature. Nature and society are combined to form an urban political ecology that unites the power of socially mobilized and ecologically transformed nature with the power of money. The water issue is just a mere illustration of how nature and society become one in the production of a sociospatial fabric that privileges some and excludes many. Water, therefore, is an integral element in this process and needs to be addressed in these terms. The recognition of the social production of nature and of the city is essential if issues of sustainability are to be combined with a just and empowering urban development. In short, in the key question that ran throughout this paper I asked whose water is being urbanized, whose nature is transformed, and who has the right to the city and its water!

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