

## The 'Agency of Mapping' in South Asia: Galle-Matara (Sri Lanka), Mumbai (India) and Khulna (Bangladesh)

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### **South Asia's ad-hoc project modus**

The territories – cities and landscapes – of South Asia are under incredible transformation due to man-made and natural conditions. As countries in the region are undergoing a process of decentralisation and devolving responsibilities, spatial planning and urbanism are greatly affected – particularly in terms of infrastructure provision, environmentally-responsive growth and transformation, synchronisation between government agencies, community participation and institutional strengthening. Cities and their hinterlands are simultaneously reaping the benefits and pitfalls of the region's near-universal endorsement of the neo-liberal urban development paradigm. Urban and rural cultures alike are overlaid with new spatial logics of global tendencies. There is enormous pressure from deregulated real estate speculation – threatening the heritage of ancient urban fabrics as well as of neighbouring fragile landscape ecologies, which is compounded by the fact that cash-strapped governments are retreating from the public realm. Globalisation is also spatially leaving its imprint as cities and landscapes are progressively being built by an ever-more fragmented, piecemeal and ad-hoc project modus – funded by established and newfound fortunes of national and international developers and lenders, development aid projects and (often corrupt) governments. At the same time, 'natural' disasters are increasing in severity and frequency – arguably due to climate change and the flagrant disregard of the environment in the relentless dive to impose imported terms of reference for modernisation and

urbanisation.

The challenges and strategic importance of realising urban design in South Asia's contemporary context of borrowed visions, abstract land-use planning and a diminishing political will are, obviously, innumerable. How to qualitatively intervene as an urbanist in such a context? How to make a difference in the sea of commercial mediocrity, on the one hand, and in the cancerous-like spreading informal landscapes of poverty, on the other hand? How to intervene in highly contestatory sites to simultaneously create new opportunities for development while qualitatively responding to the specificity of local contexts – as opposed to 'generic city' development? How to structure fragments of the urban fabric strategically in order that they have meaningful leverage effects?

### **Interpretative mapping**

There are no easy answers and/or recipes to these questions, but it will be argued an understanding of contexts, based on fieldwork, can allow for the feasible projection urban visions and strategic urban design projects that can make more evident particular sites' inherent qualities and creatively marry ecological, infrastructural, and urbanisation issues by solutions that cut across multiple scales and sectoral divisions.

Indeed, it can be argued that interpretative mapping is a first step to transform a territory. An understanding of the context and the reading of sites

– from diachronic and synchronic perspectives – are necessary in order to create modifications that have logic and relate to the particularities of places and situations. It opens up contemporary possibilities for developing an urbanism that evokes an intelligence of place – encompassing geographical/topographical and climatic realities, tangible and intangible heritages, the messiness of everyday urbanity and possible futures.

In the past decades there has been a search for new tools to describe, understand and interpret the processes conditioning emerging urban landscapes. In a seminal text, 'Present and Future of Cities,' Ignasi de Solà-Morales categorised five 'platforms' to see, understand, problematise and judge complex networks of interaction: 1) mutations: sudden processes of mutation in existing and newly emerging urban contexts are difficult to comprehend within urbanism history; 2) flows: the juxtaposition of a multiplicity of flows, resulting from the accumulated interconnections of meshes requires new architectural responses; 3) habitations: the continuing relevance of alternative procedures to the conventional approaches to mass housing, often evident in developing countries vis-à-vis the rationalisation of do-it-yourself construction, self-help, soft technologies, light planning, etc.; 4) containers: the proliferation of places, not always public, nor exactly private, in which are produced the exchange, the expense, the distribution of gifts that constitute the multiple consumption of our highly ritualised societies (museums, stadiums, shopping malls, theme parks, etc.); 5) terrain vague: the need to conserve, manage and recycle the residual spaces of the city as spaces of vacancy and absence, as a critical safeguard against a banal, productive present.<sup>1</sup>

De Solà-Morales was one of many to introduce a new vocabulary to name the contemporary processes of urbanisation. A base problem, however, remained the difficulty in visually representing the phenomenon and structurally intervening in

the territory. In the 1990s, 'descriptive urbanism' surfaced – a spectrum of new modalities of drawing and mapping, coupled with informed descriptions that have revealed patterns hitherto invisible in the shape of contemporary urbanism. At the same time, a danger continues to loom, for as urbanist Bernardo Secchi warns '... description seems, today, to have become the principle form for the organisation of the discourse, through which the city planner seeks and controls the coherence of his positions ... [yet what is] problematic in this tendency is, in fact, the frequent dissolving of city planning activity into a sterile descriptivism, which bypasses the new without revealing it.'<sup>2</sup>

Nonetheless, heeding this caveat, 'descriptive urbanism' can be operative as an evolution from mere urban history towards urban analysis – through the careful and critical reading of layered and contested territories towards 'designerly' investigations of potentials. Interpretative mapping allows for multiple perspectives and methods of looking at history, contemporary reality and data. The interplay between paradigms, discourses – be they political, scientific or populist – forces, circumstances and hazards has resulted in contemporary cities and landscapes that are neither smooth nor understandable from a single perspective. The implicit and explicit translation of discourses to physical form is further modified by continuous practices of everyday life.

The notion of 'descriptive (landscape) urbanism' can be used as a method and a critical discourse for urban analysis. The critical assessment and construction of mappings, overlays, narratives and urban biographies convey social realities on the ground. And since the paradigmatic and the descriptive can never be fully disassociated from one another, the urban analysis demands a back-and-forth method oscillating between the two – involving different scholarly and creative skills: scientific researcher, participating observer, stirring

narrator.

Urban analysis 'from above' includes the layered mapping of a city/territory. It embraces historical and contemporary mapping. The historical evolution of a place can reveal its inherent logics. The view from 'above' included the reading of ecosystems, watersheds and geographical/topographical formations, etc. which are critical to a comprehensive analysis of the larger territorial setting. It makes use of all available information produced by all available techniques (from primitive mapping to GIS). It requires the cross-reading and interpretation of raw data of different nature and a difficult process of editing to make the underlying logics of the territory legible. Drawing is a tool to select, compare, combine, analyse and describe tendencies and the latent capacities of the landscape and its relation to urbanisation.

Analysis 'from above' needs to be complemented by analysis 'from below' where an understanding of the territory or the landscape and its everyday use can be mapped from a haptic and experienced sense. Urban analysis 'from below' is premised on fieldwork. Fieldwork is an essential component of the urban analysis to augment the understanding of places 'from above'. Although quantitative, descriptive and consensus data abounds in many of today's urban contexts, it tends to be either very general or edited to reflect decision makers policies and emphasis. Due to the general unavailability of precise information, fieldwork takes on heightened significance; it serves as both 'ground-truthing' and as a base for the discovery of unspoken/unwritten realities. Fieldwork can also be understood as a sort of critical realism (critical in the process of selection and what to map). A critical reading of urban fabrics and morphologies and patterns of functioning (inhabitation, mobility, production, etc.) can be made in both a diachronic and synchronic sense. 'Layered narratives' can reveal cities' urban histories as complex spatial translations of different eras

and ideologies. The resilience and potency of the cities' multi-layered narratives questions the popular assertion of a linear development path from 'tradition' to 'modern' or from 'local' to 'global' whereby a next phase replaces a previous one.

Moreover, the mapping and critical evaluation of master-plans and 'projects-in-the-pipeline' is essential in order to understand and moderate the visions of policy making and realities of developers or donors. Access to information is sometimes problematic and handicapped by confusions between realities, 'maps' and 'plans'. Maps, as graphical representations of reality are mostly purposeful (even if unspoken as such) – in some cases even serving as straightforward police and military tools. Meanwhile, the plan – an idealised state of an imagined future reality – is the operative mechanism for urban development. Unspoken purposes or unrealisable dreams are projected upon the territory in a fashion that often has little to do with the existing typo/morphology and landscape.

Mapping is inevitably subjective and the manner in which one plans, frames, scales, gathers, reworks and assembles documentation is a highly mimetic and thus creative act. Far beyond mere description and a mirror to reality, maps are narratives in the form of drawings, collages, diagrams that reduce to an essence and reveal hidden potentials and disclose conditions for the emergence of new realities. Diagrams – as projects in the making – unfold and uncover potentials through their inevitable abstraction, selection and omission of facts. Speculative techniques of mapping are operative in the sense that they reformulate the reading of the existing territories and set the stage for the inauguration of new worlds. The combination of multiple views and scales by innovative representational techniques results in new associations between disparate facts of urbanisation over time. However, mapping is never fantasy. It never loses its realistic content. Its capacity to grasp real observable data,



issues and tendencies and its interpretative force offers a reasonable/reliable check of truthfulness. Its performance in interpreting and grasping observable data, issues and tendencies offers a reliable monitoring of truthfulness.

### Mapping South-Asian cities and landscapes

Throughout history, South Asian cities and landscapes have been travelled to, mapped, chronicled and described. The biographies of the territories remain dependent upon who was mapping and narrating and for what purpose. The cases investigated here – the southwest (Galle-Matara) coast of Sri Lanka, Mumbai (pop. 13 million), the economic engine of India, and Khulna (pop. 2.3 million), the third largest city in Bangladesh, were significantly transformed into sites of geo-political and economic importance during the colonial era – first by the Portuguese and British. All were territories where extreme world-view narratives and ideologies (political-economic models) were tested, spatialised and materialised. Cities and landscapes were carefully charted and maps of the period highlighted the strategic, infrastructural and instrumental implications of the landscape in relation to control and exploitation of the territory. [fig. 1] Not only were landscapes radically altered, but also colonial space was viewed as a laboratory, *champs d'expérience* (experimental terrains).<sup>3</sup> Cities and landscapes were developed with distinct political and administrative precincts, industrial areas, housing quarters and commercial districts. Colonial planning in South Asia is also widely recognised for its brutal containment strategies of racial segregation. Meanwhile, parallel cities of survival and self-organisation developed alongside the uneasy heritage of colonial urbanism.

In Sri Lanka, the majority of the population lived in the drier inland locations and the coast was only inhabited by small Muslim trading communities. It was only during European colonisation that coastal habitation was aggressively pursued – linking trade routes to pure exploitation of the productive

countryside. The British introduced a host of new crops in Sri Lanka – tea, rubber and spice – which worked with the topography and soil types. Large plantations developed and a rural/urban hierarchy became firmly established; settlements are nestled in the protective cover of dense vegetation. In the Indian case, Bombay (coming from the Portuguese 'good bay')<sup>4</sup> was originally an archipelago of seven islands inhabited by fishermen. As the British East India Company established the region's foothold of economic importance, the east coast of the islands became the company's first port in the subcontinent and eventually the capital city for the colonising company – Bombay became an important centre of international commerce, industry and culture. The harbour was strengthened, the shipyard modernised and the city fortified. Low-lying marsh lands were filled and by the early 19<sup>th</sup> century, the islands were agglomerated into what is now known as Salsette Island. Reclamation of the eastern seaboard continued into the early 20<sup>th</sup> century as the port expanded. The city's industrial legacy was rooted in the Eastern Docklands, its textile mills, primarily located in Girangaon (in the centre of the Island City) and the various railway lines connecting the two. Understanding the historical transformation from seven islands to an archipelago proved important in terms of projecting a restored wetland ecology, new social spaces along the infrastructure axes and connections between the defunct mill sites and the eastern docklands. In Khulna, the city rose from a hamlet to a thriving river port and administrative city due to its relation to the nearby Sundarbans (the world's largest mangrove forest) and important train link to Calcutta. Colonial maps of Khulna are related to the train connection – thereby underlining the city's role as a productive hinterland for the empire.

Beyond historical mapping of the layered narratives of landscape and cities – which reveals the extent to which urban planning and city building is inextricably tied to historical paradigms – the research gaze of a foreign architect/urbanist is able

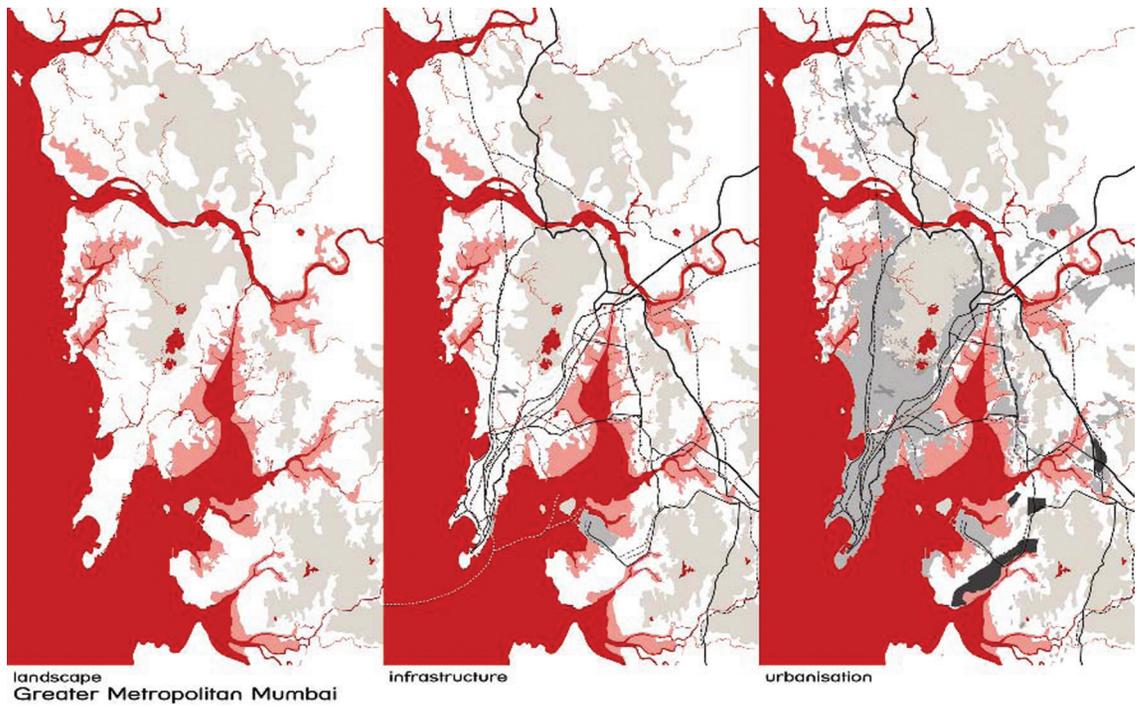


Fig. 2: Greater Metropolitan Mumbai - Landscape, Infrastructure, Urbanisation. Image courtesy of the author.

to reveal the perceived, often contested, layered realities of the city and its larger territory. Mapping 'contested territories' – industrial roles, ecological constraints and urban challenges – reveals a tension between old and new ideologies and realities, as well as between local, national and global agendas. The urbanist's gaze and descriptive map-making can be instrumental in clarifying the territories' essence, revealing hidden potential and disclosing conditions for the emergence of new realities. Working between multiple scales allowed for the discovery of potential sites for intervention and where the social needs of the inhabitants could be negotiated within the present process of unbalanced development.

### **Territorial structuring**

Understanding the shifting relationships (smooth and conflictual) between landscape, infrastructure and urbanisation became a base for descriptive (landscape) urbanism in the three contexts. The link of various qualities and opportunities of the territory to their typo-morphological settlements were mapped in order to gain insights into the logics of development.

In Sri Lanka, the territory was read as a series of fields (mostly productive) that are backdrops for a series of lines (infrastructural links) and points (urban areas, temples, schools, etc.). Along the coast are patches of higher ground, typically planted with coconuts and giving shade to settlements. Within 5 km of the coast, there are productive midlands which are characterised by a dispersed and fine-grained, extensive network of tertiary roads. Towards the highlands, settlements are sparsely settled, with minimal infrastructure and accessibility, amongst tea and rubber plantations.

The existing low-land paddy structure follows the invisible geo-morphological layers of fault lines. The paddy, together with a system of rivers, lakes and lagoons form watershed catchment basins and

act as 'sponges' or natural drainage systems. Along the southwest coast, four 'sponges' were identified: the sub-regional watersheds of the Gin Basin of Galle, the Koggala Lake (lagoon) ecosystem, the Polawatta Basin of Weligama and the national watershed of the Nilwala Basin of Matara. There are also limited and threatened areas of mangroves, wetlands, marshes, saltpans and mudflats.

Traditionally, waterways were the primary organisers of the territory – not only spatially, but also with regards to economics (paddy cultivation and fishing). Unfortunately, the network of rivers have become underestimated, relegated as backsides and left to piecemeal development, as road-based urbanism prevails. On the whole, rivers have lost the spatial status that they held during the colonial eras when they were an active part of civic life and structured urbanisation. Yet, the distinct eco-systems of waterscapes provide places with identity, particular economic and socio-cultural activities and, if properly exploited, an affordable and ecological means of water-based transportation. In addition to rivers, the southwest coast is also marked by an exploitation of its coast for tourism – where if the beaches are not the most spectacular, they are certainly the safest, as those in the east and north are out-of-bounds for most tourists due to the on-going and escalating ethnic tensions of civil war. At the same time, waterways remain a threat – from flooding and more catastrophic events such as tsunami – evidenced in 2004.

The challenge in balancing post-tsunami humanitarian relief and reconstruction with long-term sustainable development is compounded by the concurrent construction of the highly contentious 80m wide, 128km long Southern Expressway (linking Kottawa in the outskirts of the capital, Colombo, to Matara in the south). Prior to both the expressway project and the December 26 tsunami, the country's Southern coast was a relatively quiet region, with a string of secondary and tertiary towns clustered

along the coast and strongly connected to a double infrastructure bundle of rail and road – the single-track rail line that ends in Matara and the parallel 2-lane Galle Road (connecting Colombo to Matara). This infrastructure generated a nearly continuous strip of development – often only one building deep between larger settlements; coherent sea front development was impossible. At the same time, the region was marked by a rich mixture of dichotomies such as global/local, large/small, urban/rural – where coastal cities, fishermen settlements and tourism were spatially woven into a hybrid mosaic along the coast and structured by the congested and continuously animated infrastructure lines. Smaller inland settlements, whose inhabitants were primarily engaged in agricultural-based activities, were dependent upon the coastal cities for social services. The introduction of a new territorial scale by the expressway, coupled with reconstruction following in the wake of massive infrastructure and settlement erasure, has tremendous implications for urbanisation and the future of the landscape. There is an obvious close link – in positive and problematic terms – between the expressway and post-tsunami redevelopment of the coast. Not only will the shifting infrastructure hierarchies and new development significantly challenge the present-day livelihood and urbanisation trends of the region, but it will also alter the functioning, ecology and imagery of the landscape. How to integrate the new infrastructures and development most appropriately remains a critical question.

In Mumbai, the relation between landscape, infrastructure and urbanisation was mapped at three scales. The metropolitan-scale landscape is formed by mountains, plains, marshlands and water structures. The natural topography, to a large extent, dictates the course of infrastructure (roads and railways) and urbanisation has tended to linearly develop and spread along these lines in the valleys [fig. 2]. Mumbai covers 438 square kilometres of Salsette Island, although almost a fifth of this area is

occupied by the mountainous Borivali National Park (with its important lake system). The urban area is condensed into 350 square kilometres supporting a high gross residential density of about 34,000 residents per square kilometre. Public open space is limited, accounting for only 1% of this area. Indeed, space of any kind is only acquired at a premium. The island's landscape is threatened by the processes of urbanisation as the dense green structure of the park is encroached by informal settlements and the water network (including wetlands) is indiscriminately filled and/or polluted with solid waste. In terms of infrastructure, the railway and roads compose a strong north-south connection, which nonetheless remains insufficient to support the 6.5 million commuters who move in and out of Mumbai daily. At the same time, potential water transport is undermined as government proposals favour massive road building. The urbanisation is dense and covers most of the Island. A dispersed, yet growing, territory of informal housing clusters along infrastructure lines and tends to occupy land that is environmentally fragile.

At the scale of the Island City, the ecological structure is basically non-existent due to extensive land reclamation. 'Landscape' is perceived as small, dispersed pockets of man-made parks in addition to a number of urban beaches. The south-western tip is marked by the famous Malabar Hill – offering spectacular views to its wealthy inhabitants. As a result of the de-industrialisation process, the railway infrastructure is oversized for its primarily passenger use. The north-south connection overshadows a weak east-west road link, mostly composed by an articulated eclectic overlap of different urban tissues. The post-industrialisation process has created a series of vacant spaces along the rail lands, the mill lands (private, National Textile Corporation [NTC], including the related residential blocks for the workers '*chawls*') and the eastern docklands. Most of these sites are concentrated in the core of the city and form a system of potential sites for further

development.

In Khulna, mapping the transformation of the territory over its history reveals the shifting relations of urbanity to landscape and infrastructure. The spatial growth of the city is explained by its topography; it developed as a linear city. In pre-colonial times, the settlements occurred on the natural levee (2-4.2m above sea level) of west-side of the Rupsa and Bhairab riverbeds. During the British colonial era, Khulna grew due to its role as a river trading port city with administrative headquarters and market centre. The Jessore Road was an important transport link to the north and the corridor urbanised over time. In 1885, the road was paralleled by an important railway link with Calcutta (which has only recently been restored). Originally Khulna operated as a collection point for hinterland agricultural production (primarily jute, rice, tobacco, sugar cane and more recently shrimp) and natural resources (primarily fish and wood). It was established as a significant industrial base – specialising in jute mills with raw materials supplied from the nearby Sundarbans. The large and prosperous mills were linked to the riverfront and serviced by an extensive railway network. After the Partition of India in 1947, the jute mills flourished under East Pakistani management and housing colonies, schools and social/cultural amenities augmented the progressive mill layouts. Once Bangladesh gained independence in 1971, the mills became state enterprises and slid into a vicious cycle of under-investment, an inability to properly compensate workers, dwindling orders from the world market (as plastic gained in popularity) and strikes. Mill after mill began closing their doors. The city lost its economic driver.

Meanwhile, new infrastructures and programs have located in Khulna. Its urbanised area is rapidly growing due to a rural-urban immigration, with a large proportion of the population occupied in informal market activities. The demographic composition of the population is out of balance with a large

dependant group of children and few adults, putting high demands on the professionally active people. Spatially, the dense core of the city remains bundled along a stretch of 15km between the Rupsa/Bhairab River and the parallel Jessore Road; however, with development of the Bypass Road to the west, both planned and speculative urbanisation has begun. The university campus promises to be a new core area and all the plots adjacent to the highway has been sold. At the same time, the water-based urbanism of the city is falling into disrepair and the massive industrial platforms, structures and infrastructural networks are abandoned. The State remains the owner of a vast amount of property – significant holdings are in the under-utilised rail yards. The city, nonetheless, remains a centre for a largely productive hinterland.

#### **Urban/rural tissues**

The major structuring elements of the cities and landscapes are relatively easy to identify whereas understanding the major built volume of all territories, the urban fabric – the often uncelebrated (predominantly residential) infill – is more complex. However, it can be argued that the anonymous fabric is at least as significant in defining the character and culture of any given territory as are the larger structures. To further understand the territories of Galle-Matara, Mumbai and Khulna, a 1969 method of fabric analysis – by Caminos, Turner and Steffian of Massachusetts Institute of Technology<sup>5</sup> – was revisited. The systematic representation of 400x400m sample tissues revealed the correlation between various settlements, their geographic and cultural contexts. The making of the squares often literally included the putting on the map elements un-recognised, not officially mapped and documented. The compilation of an urban tissue atlas of sorts facilitates comparative analysis and remains a useful testament to the variety and richness of settlement morphologies. Admittedly, the danger of such analysis lies in the ease with which it can become highly mechanistic. However, if well-balanced, it can

reveal the inner-workings and provide a materiality to cities and their neighbourhoods.

In Sri Lanka, sample tissues were mapped and revealed the inherent structuring logics of the rhizomatic territory. At first, the territory appears as a bit of everything nearly everywhere. However, upon closer readings, the nuanced logics of urbanisation could be distilled. The simultaneity of concentration and dispersal was explained by understanding the micro-systems and hybrid economies of the region. There proved to be a complementarity of large mono-functional areas (primarily industry or agricultural patches) and small fragments. It was also observed that new concentrations – particularly post-tsunami aid projects – are creating new concentrations and thereby destroying the traditional fabric a second time over.

The series of figure/ground drawings (sampling areas from dense urbanity to tiny hamlets) proved that the predominant footprint is that of a single family house and that the density ranges from 0.3 households/ha to 15 households/ha. There is an obvious close link between topography, productive land and vegetation: in the rural areas, paddy accounts for 30-50% of the land, 10-30% for tea cultivation and 25-30% for uncultivated land/mixed vegetation; the peri-urban settlements have gardens with mixed vegetation and coastal settlements have mere coconut plantations and limited gardens. Topography also influences infrastructure and programming: roads in the countryside follow topography as do the settlements always on slightly elevated land; coastal settlements are strung along the linear bundle of railroad and Galle Road. Awareness of the region's local logics – particularly understanding the tendency for ribbon development and dispersed urbanisation of the hinterland – was fundamental in creating feasible visions for structuring a potential future.

Nine representative fabrics were investigated

in Mumbai. The fabric analysis confirmed that the city is defined by multiple conflicts, dualities, juxtapositions and tensions. It is a city of enclaves – of extreme richness and unimaginable, heart-wrenching poverty; a city of mushrooming growth – of high-rises towering over super-dense carpets of slums; a city of multiple uses – of parasitic and productive territories. The neighbourhoods researched include: Ganesh Lane (A), Phoenix Mill (B), hospital area (C), Mahalaxmi Circle (D), BDD *chawls* (E), Dadar West (F), Fort area (G), Vihar Lake & N.I.T.I.E. (National Institute for Training in Industrial Engineering) (H), Bandra East (I). The inverse figure ground reveals a large variety of footprints (from XS to XL) but all, nonetheless, with high ground coverage [fig. 3]. There are two exceptions to this. The first is Dadar West (F), the first planned suburban area of the city – where strict building regulations were applied and where proper sanitation and open space ratios were an integral part of the development. A second exception is Vihar Lake & N.I.T.I.E. (National Institute for Training in Industrial Engineering) (H) – which should be even more open. The tissue is within the Borivali National Park and Vihar Lake is the city's largest fresh water body (essential for the city's drinking water and as a catchment basin for seasonal rains). N.I.T.I.E. legally occupies space in the landscape, however the other settlement are informal and illegal encroachments which pollute the environment. Clusters of informal settlements are also evident in Bandra East (I) – otherwise an area formerly known as 'Queen of the Suburbs' (linked to the Western Railway) and with a large catholic population. The BDD (Bombay District Development) housing area (E) also has a particular figure ground – whereas the project includes the grid of 35 prototypical 4-story one-room tenement blocks. These so-called *chawls* were developed by the British as worker's housing. The land-use map shows the mixed-use nature of Mumbai's urban tissues. Exceptionally, the Fort area (G) has little diversity; in fact the area is devoid of formal housing whereas it continues to serve as the city's main



Fig. 3: Fabric analysis in Mumbai. Image courtesy of the author.

commercial, office and government facilities area: it boasts wide sidewalks and ample *maidans* (public green spaces). Ganesh Road (A) is in the heart of Girangaon and its traditional shop-house tissue is transforming with the addition of office buildings – growing due to the closure of mill lands. The Phoenix Mills (B) fabric typifies the development practices underway in the city – whereby mills are transformed to malls and flyovers divide old dilapidated tissues (and classes) from renovated ones. Finally, the vegetation map [fig.4] is consistent with the other mappings. The hospital area (C) has a series of unexpected and well-maintained parks and gardens, scattered between the various hospital and medical buildings and Mahalaxmi Circle (D) has various public green spaces – including the circle itself which hosts a public garden and a public sewage plant.

In Khulna, five extremely contrasting fabrics were mapped. 'Bara Bazar' – the original area of settlement in Khulna – is the super-dense, primarily wholesale and storage area sandwiched between the main vehicular road (Jessore Road) and the Rupsa and Bhairab River. Narrow streets are appropriated by street vendors and the relation to the river is purely pragmatic – a backside for loading goods. The Rupsa slum, located in a low-land, is similar in terms of ground cover, but not nearly as dense – consisting of low-rise *katcha* (temporary structures) and timber industries perpendicular to the river; the sample fabric also hosts a gated housing community for Christians. Khalishpur, in the city's former economic heart, along the river, hosts a number of jute mills on government property (the analysed area includes one of the few working mills – Crescent Jute Mill). There is informal appropriation by slum dwellers on the non-gated areas of the neighbourhood. In Nirala/Bagmara there is an apparent spatial collision of very different grains and tissues. The southern fringe of the city was once low-lands and marshes; in the 1990s, part of the area has been reclaimed for planned, upper-middle

class housing 'colonies' of 3-5 floors (Nirala) by the Khulna Development Authority. Surrounding the new development is Bagmara, an informal housing area of semi-permanent or temporary housing structures with predominately rural typologies. Clusters of small grain housing are incrementally developed and nestled amongst dense vegetation and small water bodies. Finally, a tissue of the colonial fabric was analysed. It represents the oldest planned residential area of the city and is typical of a British garden city colonial settlement. Today, the area is clearly a high-class neighbourhood; the streets are wide, tree-lined, in good condition, unoccupied by hawkers, have proper drainage (some of them even footpaths) and there are no retail shops at the roadside. The result is that they are used only for through-traffic and rather empty in comparison with other streets in Khulna. In some parts of the area (mainly along the river side, with personal ghats), high-class officers reside (judges, district commissioners, etc.), but most of the buildings are used for administrative and governmental functions (court, jail, Sundarbans Forest info-centre, etc.). Additional analysis was completed which made more visible the invisible structuring logic of different settlement patterns. For instance, a highland/lowland comparison between the tissue of Rupsa and Nirala confirms that the low economic classes are often left to the most vulnerable and fragile ecologies. Land-filling is an expensive undertaking and larger-footprint, formal housing develops, while the marshy, unhygienic lowlands become illegally appropriated by the poor. Also, real and perceived, explicit and implicit boundaries of Rupsa and Colonial sample tissues revealed that the visual and physical fragmentation of the fabric by gates, fences and walls is complemented by unseen divisions of religion, social groups, etc.

### **The 'agency of mapping' in South Asia**

South Asian cities are struggling to transform qualitatively. They are embroiled in the process of redefining their place in the world's mental and

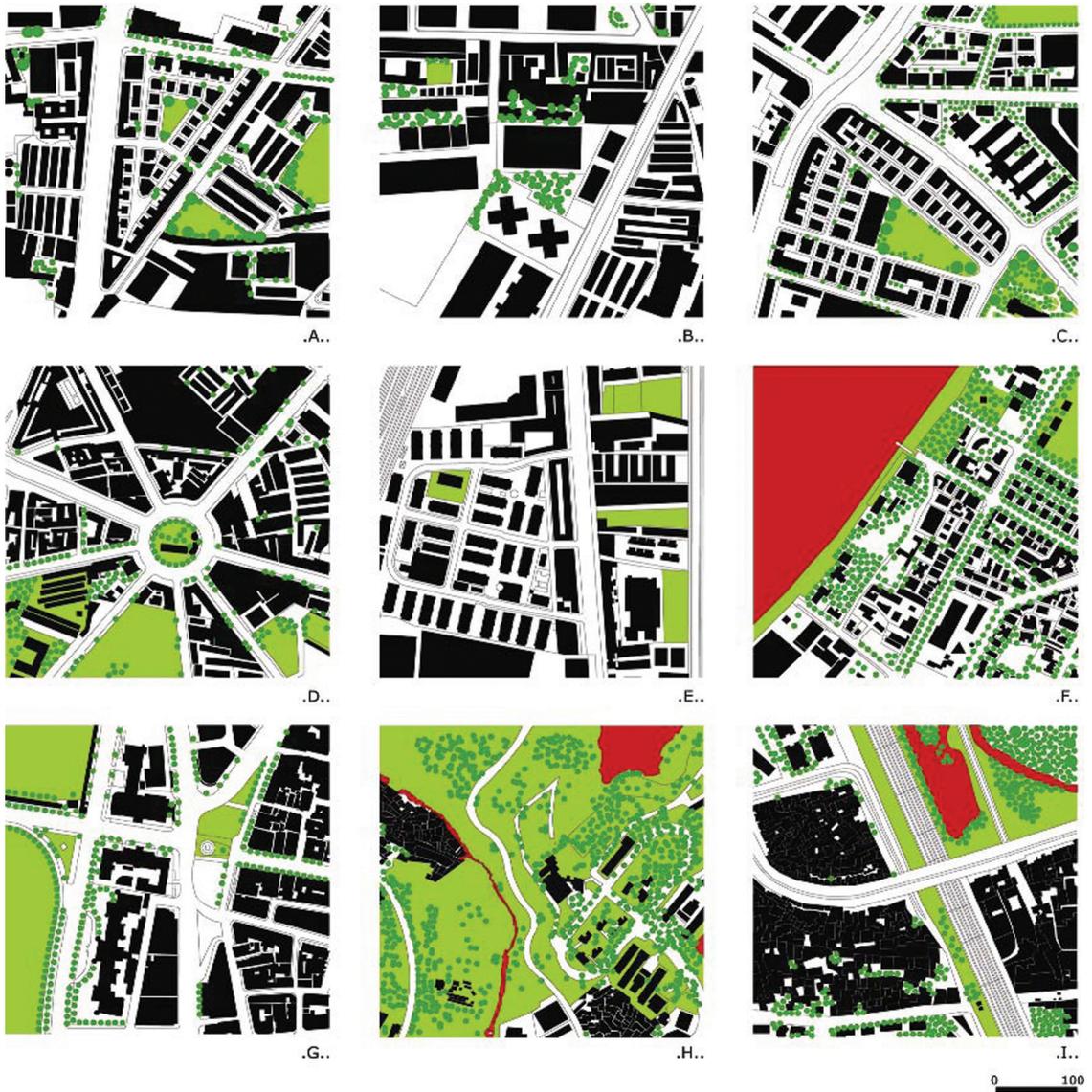


Fig. 4: Vegetation maps of nine areas in Mumbai. Image courtesy of the author.

physical landscapes. At the same time, urban development, at the regional and city-scale can no longer be controlled by the classical tools of the master plan, land use plan and building plan in the traditional sequence. As plans and zoning regulations are carefully designed, reality in the field follows its own logics. Changes in politics and economics have led to South Asian cities' entry to globalisation.

How to intervene as an urbanist in such contexts? The contemporary 'project mode' of city building has not only been embraced by planning and design disciplines, but also by real-estate developers, city marketers and neo-despotic decision makers. The urbanist/planner has the job to re-think, re-visit and re-learn means for intervention. Interpretative mapping is the first step to transform a territory. The 'agency of mapping' is the initiation of 'design research.' As Corner writes,

*Mapping is a fantastic cultural project, creating and building the world as much as measuring and describing it.... Analytical research through mapping enables the designer to construct an argument, to embed it within the dominant practices of a rational culture, and ultimately to turn those practices towards more productive and collective ends. In this sense, mapping is not the indiscriminate, blinkered accumulation and endless array of data, but rather an extremely shrewd and tactical enterprise, a practice of relational reasoning that intelligently unfolds new realities out of existing constraints, quantities, facts and conditions.*<sup>6</sup>

The 'agency of mapping' is the beginning of design research; it aims towards the provisional synthesis of several factors and at multiple scales. Following an understanding of South Asia's interdependencies of landscape, infrastructure and urbanism, it is possible to project new relationships. Through a dynamic interplay of urban visions and strategic projects designs can then make realistic, yet radical, amendments to the region's project mode, which

in its orientation towards the liberal private market has seemingly forgotten to provide public services to the majority of its inhabitants. Design is able to overcome antitheses that are insolvable in non-spatial terms (political claims, social programmes, etc.) (Design) research has an advantage in that it not necessarily solves problems, but can question and reformulate problems, form insights and suggest possible outcomes. The staging of spatial scenarios differs from that of making forecasts and the precise testing of desirable situations for which certainties are required. Design as a tool for negotiation, whereby specific solutions for strategic sites are investigated, has the luxury of being both very concrete and yet open for alternatives and modifications.

Finally, there are two other emerging trends in mapping methods that can expand the 'agency' of urbanists. First is the mapping/projection of actors and stakeholders. In light of a global retreat of the State, new stakeholder coalitions are required not only for modernisation and development, but also for safeguarding the interests of the (partially marginalised sectors) of the population and for protecting the environment. Ultimately, a civic society requires some-sort-of balance between private and collective interests, between representative and participatory democracy. An example of such mapping/ projection was made for Mumbai which reveals how to creatively engage, for a project on mill and port sites, a wide array of actors. A series of new coalitions were considered, while at the same time recognising that the private sector is the dominant actor in Mumbai's real estate. The proposal works with the notion of public-private partnerships, the leasing of state land to developers and the selling of key sites to create necessary capital for public infrastructure (re)development. Second, is the development of new GIS-data-based visualisation tool for the interactive exploration of three-dimensional landscapes. The development of Lenné3D was funded by German Federal Environmental Foundation (DBU) from

2002-2005. The prototype software creates digital visualisation of vegetation and plant life and allows for the automatic generation of plant distribution maps. The Khulna design studio, to be completed in Spring 2008, will work (through students of the University of Wageningen) with the enhanced computer tools and extend the plant database to species indigenous to Bangladesh. The descriptive (landscape) urbanism analysis/design will add a progressive new tool to its investigations.

### Notes

1. Ignasi de Solà-Morales, 'Present and Futures. Architecture in Cities', in *Present and Futures. Architecture in Cities* (UIA Conference Catalogue) (Barcelona: Collegi d'Arquitectes de Catalunya and Centre de Cultura Contemporània de Barcelona, Actar, 1996), pp. 10-23.
2. Bernardo Secchi, 'Descriptive City Planning', *Casabella*, 588 (March 1992), pp. 22-23 (English text pp. 61-62).
3. Gwendolyn Wright, *The Politics of Design in French Colonial Urbanism* (Chicago: University of Chicago Press, 1991).
4. In an attempt to overcome its colonial era, the government decided to change the city's name in 1997. The official name of the city is now 'Mumbai', named after a local deity.
5. *Urban Dwelling Environments*, published in 1969 by MIT Press aimed '1) to dramatise the correlation between settlements and the geographic and cultural context ... 2) to illustrate various levels and aspects of the physical environment 3) to compare and contrast different 'products' and their relationship to effective demands 4) to find a framework for a more comprehensive approach to settlement development and design' [v]. The authors sought 'to better understand the relationship between people and their dwelling places in the context of rapid social change.' And for them, 'analyses are no more than catalysts for leading questions about the relationships between socioeconomic contexts, housing demands and environmental products and no more than raw material for the formulation of hypotheses [vi]. See: Horacio Caminos, John Turner and John Steffian,

*Urban Dwelling Environments: An Elementary Survey of Settlements for the Study of Design Determinants* (Cambridge: The MIT Press, 1969).

6. James Corner, 'The Agency of Mapping: Speculation, Critique and Invention,' in *Mappings*, edited by Denis Cosgrove (London: Reaktion Books, 1999), pp.211-252.

### Biography

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