THE ROLE OF LANGUAGE IN THE EXPLORATION OF FUTURES

Reimagining the Tanks of Bangalore

By Sreemoyee Roychoudhury

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This research was conducted in Tkaronto, on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee, and the Wendat peoples. Tkaronto is covered by Treaty 13 signed with the Mississaugas of the Credit, and the Williams Treaty signed with multiple Mississaugas and Chippewa bands.

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TO FOUR O'CLOCK RAIN,
& THE BANGALORE TERRAIN.

ABSTRACT

Taking into account dominant Ameri-European thoughts and practices that have shaped our past, and inform our present - as the only way of exploring futures, this major research project explores the role of the language of design in strategic foresight by inquiring into the future of the water crisis in Bangalore, Karnataka through its network of ancient Tank irrigation.

The examination of non-western approaches, and knowledge around water through oral storytelling and myths, religion, policy, local practices, and the impact of colonialism highlights the gaps in current practices, and interventions being proposed for the water crisis in Bangalore to understand how much of it is being informed by colonial frameworks, and how might the language used in design, inform the language of design.

The research includes a collection of narratives, and, the remnants of colonialism in the current design practices around the Tanks in Bangalore, and how design interventions are controlled by the language that creates it. For example, current solutions to its water crisis are based on the 'Western' language of lakes, instead of the local language of 'Tanks'. Finally, it provides an insight into the importance of the 'local' and 'traditional' in foresight practices, and why focusing on the colonial language cannot decolonize futures. It also looks at a foresight method in a critical lens, to assess its use in a non-western setting.

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RESEARCH QUESTION

How did the language of colonialism change the trandiotnal water systems of tanks in Banalore, Karnataka?

- How much influence do the local languages have in the design of these practices
- How did the global English language alter the meaning of local knowledge?
- How might we start to think about designing more inclusive foresight tools to incorporate a plural language of design in a non – western world – to reclaim knowledge systems and traditional design practices?

BANGALORE: A PERSONAL ESSAY

I moved to Bangalore from Kolkata in 2011; a shy 18 year old with a portfolio full of dreams. The auto rickshaw fare was almost double, curd was a part of every meal, and so were curry leaves. The bengali in me missed the dal (lentils) my mother forced me to eat everyday; instead I was eating watery sambar-rice (also lentils, but cooked with curry leaves and vegetables). There were trees everywhere, parks, and gardens; and there was no electricity in the hostel on sundays. I don't know what I was expecting, but there were a lot of shocks, and a few surprises. My fondest memory is of the first rainfall; it started exactly at four, and lasted for about twenty minutes. It came back the next day, and then almost every other day after that for a year; four o'clock rain. I had read about it in school, but coming from a city where monsoons lasted two whole months, and half the city was submerged in water, it had never enticed me. It was a different story when I experienced it in person. The smell of the ground changed a few minutes before the sky erupted, and water came pouring down. And then it stopped. At first I didn't realize that it had stopped, and I kept waiting for something every evening at four without realizing what was missing. Bangalore had lost its rain to global warming.

The first Cauvery-water tank incident happened so long ago that I can't believe I still remember it this clearly. It was a sunday morning, almost a decade ago; my roommate and I were suddenly woken up by a loud banging outside our gate. We got out of bed and opened the gate, somewhat reluctantly. Sundays were sacred, and we liked to sleep in and do nothing even with no electricity, in the middle of summer. We were greeted by the most excited version of our security guard who normally never made eye contact. "Cauverey ka pani aya hai didi, jaldi gate kholiye" (There's water from the Kaveri river, sister. Open the gate quickly). Within ten minutes we had 'Cauvery water' flowing from our taps, delivered to us

by a water tank (truck carrying water) and an equally excited tank driver. That was my first encounter with the Cauvery water 'feud' between Karnataka and Tamil Nadu. The water from River Cauvery was split between the two states, and it was sacred for more reasons than one. It was also heavily contested; this water carries with it a lot more than silt, soil, and impurities- it carries policies, politics, prayers, hope, and two economies. For our security guard, it was 'fresh' water and not the usual limited 'groundwater' that usually flowed through our taps; it also carried the echoes of joy.

We used to have to turn on the water pump once a day. It transferred the water from the underground tank to the rest of the house. We rationed that water for the rest of the day between the six of us who lived in that college hostel (a two storeyed house). One time someone had left the then dry tap open before heading off to class, and we came back home to no water, because it had all drained out while we were in school.

After I graduated from college, I moved in five minutes away from Ulsoor lake, one of the more popular tanks that had been converted into a lake. I used to go running on the cemented path around the lake. It was meant for leisure and recreation, its borders permanently defined by the surrounding concrete, and the fence. It's funny how a landlocked place with no perennial rivers helped me develop a special relationship with water. Dr Dilip DaCuhna talks about rivers being a 'Western' idea. He talks about another River, the Ganges, and the same could be applied to River Cauvery as well.

> ...The names Ganges and Ganga, even though often used interchangeably, refer to different realities, each articulated in a distinct moment of the hydrologic cycle. Ganges is a river and Ganga is rain. They are the basis of two places: India, a geographic surface drained by rivers; Sindhu, an ocean of rain. Each is the basis of a distinct language of design. The more one is pursued, the more it diverges from the other (Mathur, & Da Cuhna).

the wetness of the ground; the freshly washed temple flowers, and the puddles on the streets; the five hours of running water in the taps, and the filled out buckets for when the water ran out. This imagery was juxtaposed by the frothy lakes that sometimes burst into flames, taps that ran dry, the rain that never came, and buildings that replaced water bodies.

CONTEXT

1. CURRENT SCENARIO IN KARNATAKA

During the course of our engagement with Bengaluru's lakes over the past two years, three events associated with three well-known lakes - Ulsoor, Jakkur and Bellandur - located in the central, northern, and south-eastern parts of the city, respectively, took place (Sengupta, 2018). I was a resident of Bangalore when these happened. Dead fish were found on the banks of Ulsoor lake, Jakur lake became the source of a thermal power plant in Yelahanka, and finally Bellandur lake started frothing and caught on fire. Coincidentally I went to college in Yelahanka, lived in Ulsoor, and went to work in Bellandur. Ground water serves 85 percent of the rural population's drinking water requirement and nearly half of the urban and industrial requirements in Karnataka (Raju, Manasi, & Latha, 2008).

> One among the major metropolitan cities of India facing water crisis is Bengaluru in the state of Karnataka, the third most populous city of the country with a population of 10.2 Million and density of 47% as of 2015. The average annual rainfall in Bengaluru is 859 mm and it is very obvious that such low level rainfall has resulted in the decline of ground water levels. Some bore wells that are not too deep have gone dry (Parameshwara Murthy, Murthy, & Kavya, 2016)

Half of the population of Bengaluru will have to be evacuated in another 10 years if the problem of water crisis is not solved immediately. Currently, the water deficit in the city is 155 MLD (Millions of Liters Per Day) and is expected to reach 514 MLD by 2025 (Parameshwara Murthy, Murthy, & Kavya, 2016). Bangalore's Natural Water Resources Bangalore is located at an altitude of 920 msl (altitude or height above the average sea level) due to which the natural flow of water is away from the city and into the valleys surrounding. Each valley at the ridge top gives

birth to small streams which cascade down to form major stream systems (BIOME, 2016). In early 2018, reportage on the water problem again surged with a BBC (2018) report naming Bangalore as the second most likely city in the world (behind Cape Town) to run out of drinking water in the near future (Goldman, & Narayan, 2019). If irrigation has ceased due to changes in the land use from agricultural to urban use, and if these lakes are also not being used as water sources, one would expect them to be filled up during the monsoon and stay largely full (minus evaporative and infiltration losses) for the rest of the year. However, the actual picture is of two extremes - some lakes are full but with sewage, while other lakes are dry for most of the year (Sengupta, 2018).

> The ground water status of Karnataka in March 2004, indicates that out of 175 taluks (administrative division), 22 are over exploited where the extraction levels are more than 100 per cent, 9 taluks are 90 per cent exploited, 102 together form - partly overexploited/critical/semi-critical while 51 taluks are safe. Out of the total area of the state, about 30 per cent is over exploited. Government of Karnataka Ground Water Studies, Status of Groundwater Quality in Bangalore and its Environs by Dr. M. Basappa Reddy (as cited in Raju, Manasi, & Latha, 2008).

Development of ground water supplies has drastically increased during the 20th century (Raju, Manasi, & Latha, 2008). As water scarcity increases, poor farmers with small tracts of land do not have sufficient resources to invest in bore wells and hence they grow dependent on wealthier farmers for work. The concept of coloniality has opened up, the re-construction and the restitution of silenced histories, repressed subjectivities, subalternized knowledges and languages performed by the Totality depicted under the names of modernity and rationality (Mignolo, 2007). Small farmers who have bore wells find it difficult to bear the repair and maintenance costs the bore well requires when pumping at such a deep level (Goldman, & Narayan, 2019).

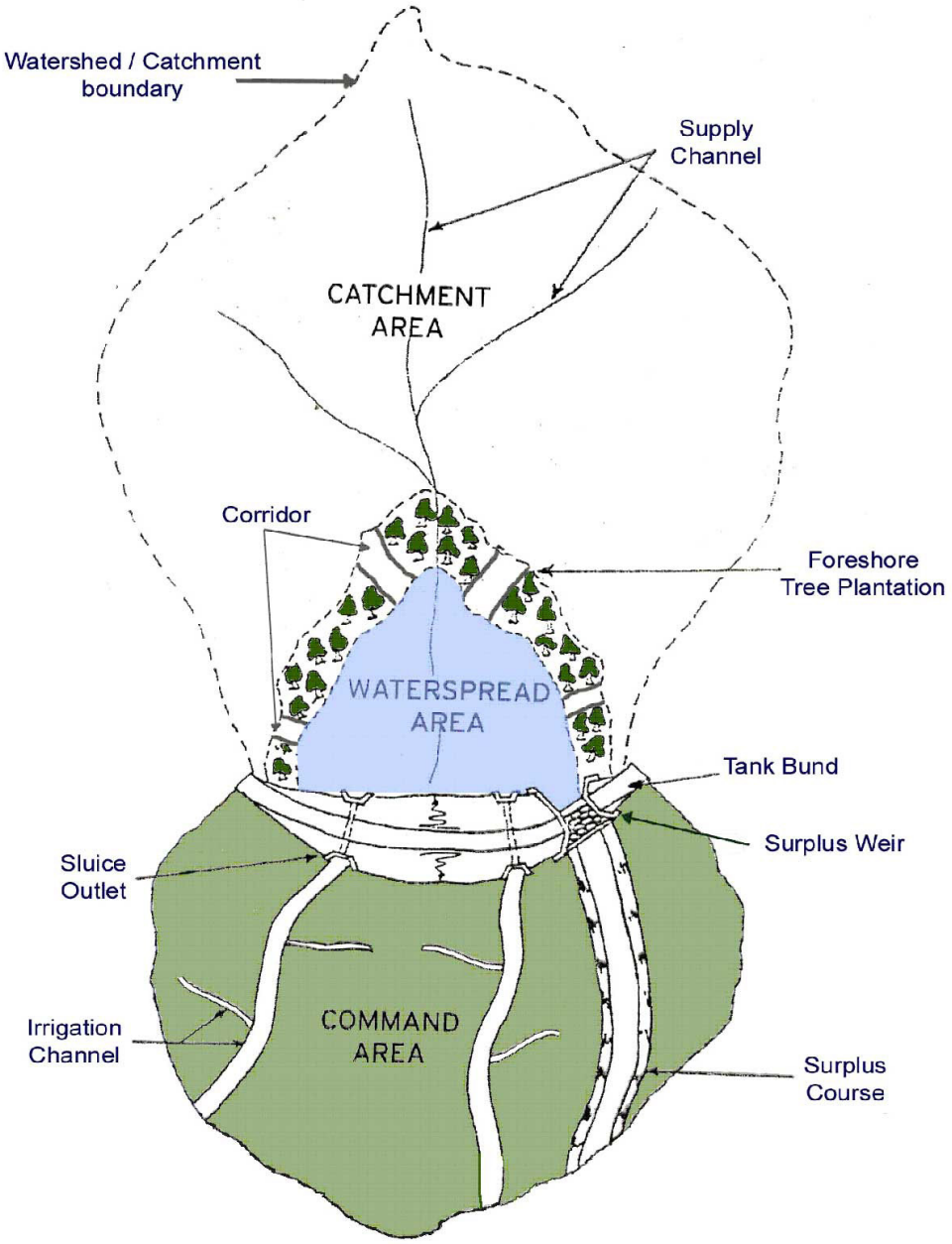

Figure 1: Example of a Tank Irrigation Network DHAN Foundation (2006)

2. POLICIES

When looking at policies around Tank management, there is a level of denial from the farmers as well as state government. On the one hand, farmers are demanding a higher level of state intervention and participation in creating,

managing and maintaining rural infrastructure including irrigation infrastructure, on the other hand the state machinery is developing an approach which will make communities responsible for tank management and maintenance (Shah, 2003). This is contradictory, and leads to the questioning of why the state has not been able to allocate funds, and better support to these communities who have been maintaining the tanks for years. The tanks were initially constructed to cater to the agricultural and domestic needs of the settlements. Hence, most of tanks and their connectors (nalas) have institutional land uses abutting them (Saidoddin, Suseelan, & Krishna, 2011).

Sengupta (2018) addresses the problem with the current policies in place with regards to the tank system and its maintenance, and management. She writes that:

> ...the official institutional arrangements for the management and governance of these lakes are confusing and in constant flux. The original irrigation reservoirs were being managed by local communities through customary arrangements until early 20th century, when they were taken over by the colonial government. The policy was continued by the Government of Karnataka after independence and state reorganization. The Minor Irrigation Department (MID) was the custodian (manager) even as the Revenue Department was designated as the owner of these reservoirs. On the other hand, the Fisheries Department auctions the fishing rights in these water bodies. When the water bodies became part of Bengaluru city or its fringes, Bengaluru Development Authority (BDA)11 was given custody of many of them, while others were transferred to the Karnataka Forest Department (KFD) and a few original tanks to the municipal corporation. A Lake Development Authority (LDA) was set up in 2002, ostensibly for lake rejuvenation using funds from various external donors, but was caught in a controversy because it attempted to lease out lakes to private companies. A Karnataka Lake Conservation and Development Authority (KLCDA) was

formed under a new law in 2012, but it has custody of only four lakes, and is largely playing the role of providing technical support. Custody of most of the lakes in Bengaluru is shifting back and forth between the municipal corporation - Bruhat Bengaluru Mahanagara Palike (BBMP) - which has 109 (lakes) and BDA which has 92 (lakes) (KLCDA, 2016). KFD has custody of five lakes, and the Fisheries Department continues to control fishing rights in all the lakes.

Water crisis is not solely an urban or a rural phenomenon, but intersects with the policies of rural–urban disinvestment and speculation (Goldman, & Narayan, 2019). If one looks at tank policies in Karnataka, it's very evident that just like agricultural and wastelands (grasslands), tanks are also being sold to real estate developers. Water is being torn apart in the process, as different levels of political agendas are at play - the government, real estate developers, architects and designers. The growing cities have encroached upon tank-beds and nalas for provision of housing, infra-structure, services (Saidoddin, Suseelan, & Krishna, 2011). One viewpoint believes that the intervention of the British state led to the alienation of community participation. And the second holds that the apathy and negligence of the post-independent state was responsible for deterioration and decline of local resources (Shah, 2003). I believe it is a combination of both, as a result of a colonial invasion of traditional systems. The British State introduced capitalist approaches, and gave power to land owners who were allowed to take money from the rest of the community using the tanks, and as a result, the post-independent state struggled to go back to its non-capitalist local approaches, and that resulted in the decline of tanks.

“We all live within a multiplicity of colonialities; subjected in both body and mind. It is not only our labor, or our sexualities and genders that mark colonial relations; it is not only the wars, the mass murder and death squads organized by imperialist classes, nor the subcolonies formed by women, African-American communities, or ethnic identities; it is also the hegemonic mind, the white, or masculinist, or heterosexist, or national chauvinist mind that constitutes and is constituted by coloniality.”

- Steve Martinot

BACKGROUND

01. TANKS:

I wanted to first understand what tanks were as a pre colonial irrigation system, and what they have become. The problem associated with decentralization of irrigation works is that the value of tank irrigation and management has been superseded by capitalistic type of irrigation, and therefore control of local bodies over irrigation works is much reduced. Further, local bodies lack regulatory powers relating to law and order, revenue and land acquisition functions (Vani, 2015).

The South Indian terrain is ideal for the construction of tanks (In addition to being river fed, tanks also harvested the rainwater from its surrounds, and many a time, their beds being below the water tables, were even groundwater based) (Ramachandran, 2003). Traditional water harvesting systems in India declined or were substantially degraded by a range of colonial actions for rule and profit (D'Souza, 2006). For example, Colonial interference involved the surveying of land using triangulation, and marking it based on what they thought was valuable. They tried to make sense of this land, and Triangulation would determine the exact position of "great objects" on the Indian peninsula; but it would also reveal a dynamic land...it also draws attention to a world that resisted the fixing (Mathur & Da Cunha, 2006) that the colonizers so desired. One such resistance came in the form of Tanks, whose existence defied both western vocabulary, as well as school of thought – Benjamin Eyne had noted this in 1800, 'Lakes, in the right sense of the word have nowhere been observed by me in this country, but tanks or water reservoirs with artificial embarkments are in great abundance' (Mathur & Da Cunha, 2006). As Vani puts it, that there has been 'an erosion of the autonomous functioning of village management systems'(1992), that a traditional system of village tank maintenance and management through specialist village committees,

and voluntary labour (known as kudimaramat) has collapsed, and that traditional wisdom is dying (Agarwal & Narain 1997, Gadgil & Guha 1992, 1995) (as cited in Mosse, 1998).As the same tanks, now called lakes in post-colonial India bursts into flames - while Bangalore struggles to find drinking water, can the use of a new language of design, based on local stories, myths, and a reimagined telling of history, unearth Bangalore's ancient water system?

If you were to read a headline about Bangalore from the past few years, you would most likely stumble upon articles about lakes frothing, or bursting into flames, about taps running dry, lakes drying up, and the overall scarcity of drinking water. While none of those headlines are false, they speak of a singular Bangalore.

Most of Bengaluru's lakes are not natural lakes, but human-made tanks created by damming the flow of water at various points. Three valleys in Bengaluru determine the flow of water in the city (D'Souza, 2015). According to a British irrigation authority, 'for the most part, the soil is naturally poor, and it is the irrigation (water systems) alone which makes the province such a scene of fertility' (Agarwal, and Naraqin, 2018). The vast undulating terrain around the city, when contoured by labourers, functioned as a water catchment system with water flows cascading from one water body to another, and contained water percolating down, replenishing the aquifers below (Mathur & Da Cunha, 2006). These tanks were built centuries ago. Records from the 6th century onwards show that successive rulers of the city invested in creating an interconnected, community-managed system of tanks and open wells (Unnikrishnan, Nagendra, and Broto, 2018).

The hydrology is such that tanks interlinked through drainage flows form chains or "cascades" broadly oriented to follow the gentle southeasterly slope of the land from the western hills to the eastern coast and capturing the maximum

amount of runoff for irrigation (Sengupta 1993, 61). These were not designed as systems, but were developed piecemeal over several centuries as antecedent works were incorporated, improved, or integrated[JM5] . New tanks were added to a series, small dams or “anicuts” were used to improve supply to existing tanks, and channels were excavated to interlink them (see Ludden 1985, 53). This is reflective of the traditional language of design that is transitory, and adaptable. It is this incremental approach that allowed tanks to be interchangeable in their role, instead of a rigid ‘system’ with fixed parts. They ensured an optimal use of common resources (DHAN Foundation, 2006), which was shared by the entire community. I would argue that this was a network built over time, based on growing needs, and opportunities.

Ecological	These tanks have become wetland ecosystems, which sustain and attract many species of birds, insects, fishes etc. Disturbing and manipulating of the water network may result in the ecological imbalance in the urban areas.
Hydrological	The tank systems check flash floods, due to heavy rains in low lying areas. They reduce soil erosion, by trapping sediments and by regulating run-off. Breaching of tanks at higher elevation has resulted in flash-floods in low-lying areas, like Madiwala, Koramangala, Wilson Garden etc.
Climatological	They influence the micro-climate of their surroundings. They reduce surface radiation, regulate humidity, maintain soil moisture, reduce surface temperature and cool the atmosphere. The encroachment of tanks has resulted in reduction of water-spread area, thereby changing climatic conditions and increasing temperatures.
Religious	The tanks are embanked by institutions. There is presence of shrines along the edges of tanks. Tanks are used for immersion during festivals etc.
Socio-economic	The tanks can be used to generate employment, through various activities, like cultivation, fisheries, recreation, hawking along lake promenades, etc, which in turn generates economy.
Educational	The tanks can be used for the biological study of ecosystems and their flora and fauna, for water supply, sewage treatment and related activities, botanical and horticultural activities in adjacent parks and gardens etc.
Infra-structural	Tanks can be used as alternate sources of water, even during the present times. The tanks can be recharge points for the under-ground water-table. The water treatment plants and sewage effluent treatment plants can be setup along tanks to re-use the water for landscaping etc.
Structural	The tanks and their connectors, essentially form the first layer, that structures the city as a water network. This layer is super-imposed by other layers, like road network, rail network, commercial network, industrial network,open space/ landscape network etc.

Figure 2: The importance of the tank network, based on Saidoddin, Suseelan, & Krishna, 2011

The technical and hydrological arrangements of this irrigated landscape shaped social strategies for the allocation of water; the control of floods; and (as I will argue below) the organization of supralocal political power, which granted rights and mediated constant disputes (Mosse, 2006).

Vani (2015) worked on a case study in irrigation management, and as part of her research interviewed different stakeholders from two districts in the state of Karnataka. As part of her findings, she learnt that:

A tank irrigation committee used to function with the Assistant Commissioner as Chairman and Tahsildar as Convenor. After the Irrigation Act of 1965, the Executive Engineer of that department was made Chairman, with the Assistant Executive Engineer as a Convenor. The Tahsildar, Assistant Director (Agriculture), farmers' representatives nominated by the AEE, the agricultural officer in charge of soil conservation were all members of the committee. The function of this committee was to discuss the cropping pattern, after assessing the sufficiency of water in the tanks for the entire command area. The Assistant Commissioner gave the proposals to fix the cropping pattern for every village, suggesting the amount of water necessary and its distribution pattern (in other words, exercise the functions normally done by farmers). The committee has not met for the last four years. This is not surprising: considering the fact that there are 145 tanks in the taluk, the task of assessing the water levels in all these tanks, and fixing cropping pattern for every village for each season, and also to persuade the farmers to adopt the proposals would have been a task beyond the capacity of a single committee at the taluk level, however high powered.

02. FORESIGHT AS A METHODOLOGY

The kingdoms in early south India between roughly the eighth and sixteenth centuries AD rose and fell on their ability to extract and sustain agricultural production, which in turn rested on the effective control of water (Shah, 2012). India had a variety of knowledge systems in mutually supportive, dialogic relationships. In other words, it had smaller, localized, subaltern knowledge systems, some of which survive to this day among our so-called tribal (indigenous) populations (Bilimoria, & Irvine, 2009). In Indian religions time is considered cyclic, which is based on our daily experiences... It is the concept of yugas and kalas or eons and epochs, which are much longer than the ordinary and commonly felt small cycles of time. Each maha yuga or great cycle of time is said to be consisting of four yugas, namely krita yuga, treat yuga, dvapara yuga, and kali yuga Anwar, 2011). This is very different from the twenty-four-hour cycle followed by the west, and unlike the linear notion of time that the western civilization follows.

> With the consolidation and spread of British rule in the mid-eighteenth century, however, this intellectual dynamism began to dissipate. By 1800, indigenous intellectual formations across a broad spectrum of disciplines were on the point of vanishing altogether as a creative force in Indian life, to be supplanted by other knowledge systems based on unfamiliar, sometimes radically different principles of epistemology, sociality, and polity (Pollock, 2000, 2001).

The anti-colonial stance fosters the idea that intellectuals should be aware of the historical and institutional structures and contexts which sustain intellectualism (Dei, & Asgharzadeh, 2001) Futurists aim to discover or invent, propose, examine and evaluate possible, probable, and preferable futures. They explore alternative futures in order to assist people in choosing and creating their most desirable future (Bell, 1996). Actual past experiences of individuals and groups, perceptions and knowledge about the past of one's particular society and of the human past

in general, both history and prehistory, shape what men and societies are in the present (Bell, Wendell, and Mau, 1971).

Sardar (1993) talks about colonial tendencies of western foresight as a discipline. He says:

> As such, futures studies is not so much an embryo but a well developed fetus waiting to enter the world of academic disciplines. When that crucial transformation takes place, futures studies-like development studies, anthropology and orientalism-will become another academic instrument for the subjugation and marginalization of non-Western cultures.

I argue that this is already a reality, especially for indigenous, and marginalized communities from non-Western backgrounds. Sardar, while talking about the USA becoming a superpower in the 1960s, and at what cost, mentions that this first technical/analytical phase of futures studies thus emerged from the need to keep the non-Western countries ideologically pure and in full agreement with Western political and economic interests (Sardar 1993). Futures continues to be dominated by Western, male views and actors, as many people have pointed out (Dator 2002). I long ago came to the conclusion that futures studies does not study "the future" since "the future" does not exist and therefore cannot be studied, per se. What we can study empirically are "images of the future"--ideas about the future that do exist--in each individual (often several contradictory images), in each culture, differing between men and women, young and old, over one's life, depending on past experiences and current events, and, most importantly, serving as a basic rationale for action in the present (which then helps shape the future) (Dator, 2002).

The constructivist epistemology and associated theories of knowledge and action are important for foresight. Foresight is intended as a precursor to action and is concerned with the generation of knowledge about the anticipated consequences of different actions, including historical actions. Its authenticity and power relies on the relationship between knowledge and action (Fuller and Loogma, 2009). For example, Mignolo, & Escobar, (2013) wrote, we do not think within the mind-frame of modernity, looking for the last gadget to replace the old ones. We are suggesting that the decolonization of the mind is also necessary among thinkers and doers who do not reject Western contributions to world civilizations. It is about a theory that cogently speaks to the imperial present from, with through and against the colonial past. It is a theory that dialectically centres the subject by way of the historic present (Simmons, & Dei, 2012).

Whether or not the futurist's message will be heeded in the years to come remains to be seen. What is without doubt is that the future is now being prepared, largely by human actions that have already been taken, that are being taken, and that will be taken (Bell, 1996). In less than two generations, people in most countries in the industrialized world have become more disconnected from an everyday experience of nonhuman nature as a result of urbanization, habitat loss, and efficiency improvements leading to a drastically reduced workforce in agriculture, forestry, fisheries, and other natural resource–based vocations (Beery, Jönsson, & Elmberg, 2015).It is here at the heart of the capitalist world system that the problem of unsustainable development arises in its most acute form. Ecological struggles are therefore connected inseparably to the struggle against imperialism, which takes on new meaning when viewed in terms of the exploitation of the earth's resources (Foster, 1996).

03. CULTURAL EPISTEMOLOGIES AND CURRENT FORESIGHT PRACTICES

There are no limitedly scientific, technological or market-based solutions to climate change, only social and political ones that challenge the power of capital to exploit workers, the unwaged, those denied a chance to work and the natural environment upon which all life on earth is based (Foster, Clark, & York, 2011). It is being increasingly acknowledged that colonial difference is a factor not just of economic or political power but also of contending knowledge systems. These knowledge systems, apart from being differentiated by the amount of power they enjoy, are also based on alternative epistemologies (Bilimoria, & Irvine, 2009). The challenge for the anti-colonial framework is with extricating these deeply embedded reservoirs of knowledge as embodied historically through a particular time and space by the colonial engendered body (Simmons, & Dei, 2012) There are two dominant approaches to the history of the pre-modern knowledge systems of south India: the post-colonial historiography of science and technology, and the general historiography of early south India (Shah, 2012).

> Water in the Indian context is a diverse, multifaceted issue. When related to Culture, it takes on many interesting twists and tales...It is not looked upon as a mere element for practical use, but is elevated to a Godly status and thus revered and respected. In addition to such agricultural, industrial and domestic needs, water in the Hindu culture is intricately associated with religion and is looked upon as Divine. It has the role of not only being the physical purifier, but also and more importantly, the spiritual purifier (Ramachandran, 2003).

The advantage of this spiritual value was that the person who built the tank did so to give it away as an act of charity to be used for public good. The receivers assumed a collective responsibility over the tank. But water did not assume the character of a commodity (Agarwal, and Naraqin, 2018). Faced with limited natural resources, there is no rational way to prioritize under a modern capitalist system,

in which the well-to-do with their economic leverage decide via the market how commodities are allocated (Magdoff, & Foster, 2010).

> ...those futurist thinkers who use non-Western philosophies and modes of knowing as the basis for constructing alternative visions of the future, and work for that vision, operate strictly in the European tradition of humanism-a tradition that is totally enveloped in the secularist worldview. The end-product of their thought is often a grotesque parody of non-Western thought, philosophy and tradition (Sardar 1993).

Before the British usurped and consolidated the various power centres in India, the community owned and kept the tanks in good shape. This was because they followed a traditional self-governing system, and they treated tanks as water, and not a 'water-body'. They respected the tanks, instead of treating them like commodities. After the British took over the tanks as property of the State for revenue purpose, the centralised management prevented the local community from collectively maintaining and managing them (DHAN Foundation, 2006).
Almost all the problems we face nowadays are complex, interconnected, contradictory, located in an uncertain environment and embedded in landscapes that are rapidly changing (Sardar, 2010). For example, the water scarcity of Bangalore city has worsened. This may be attributed to various reasons including climatic change, reduced rainy days and rainfall, high deposit of silt at the dams, overdraft of groundwater for various needs like agriculture, industry and human consumption (Grönwall, 2008). Access to this limited resource is unequal, with some communities getting priority over others.

Futures thinking helps create the conditions for a paradigm shift. The organization imagines a new future, creates a new strategy, enables stakeholders, uses tools and then a new future(s) emerges (Inayatullah, 2008). Given the diversity

of cultures on this planet, there are different knowledge systems, different histories, different forms of living, different criteria of accomplishment and different ways of adjusting to change. Futures studies need to take account of this diversity in their frameworks of concepts, theories and methods (Sardar 1993). Our most necessary, most rational goals require that we take into account fulfilling basic human needs, and creating just and sustainable conditions on behalf of present and future generations (which also means being concerned about the preservation of other species) (Magdoff, & Foster, 2010). For a majority of the people living in towns and cities in India, day-to-day survival is based on transfer of water from areas further and further away, via pipelines and/or tankers.(Raj, 2013).

The language of design is important in decision-making, but is currently colonial in its imagination. While there have been a lot of interventions to solve Bangalore's water crisis, these interventions are also designed around Western frameworks. They will not work. By reclaiming the language of design, we can explore futures that are more equitable, and inclusive in its design; using local knowledge, language, and philosophies, to help solve this water crisis.

and further away, via pipelines and/or tankers.(Raj, 2013).

METHODOLOGIES

This project utilizes a qualitative methodology to reimagine the language of design in the exploration of futures, utilizing archival research, interviews and CLA. I first understand the historical narratives of the Tank network - pre, and post colonialism, to analyze the shift in the language of design, and change in the treatment of tanks, and argue that this change in part, has resulted in the water crisis that Bangalore is currently facing. The work is also part auto-ethnographic as I draw from my own experience.

1. EXPERT INTERVIEW

Dr Dilip DaCuhna was interviewed in this project to bring forward an alternate point of view from some of the current practices. His work uses a very local design language, with an emphasis to local terminology, and imaging.

2. ARCHIVAL RESEARCH

As methods go, "historical-comparative methods" are something like that drawer in your kitchen where you put all the useful stuff that doesn't logically go in other drawers. The things in this special drawer are unique, and therefore of high value to me because they do what they do better than anything else in the kitchen. So it is with historical-comparative methods (Luker, 2009).

This project uses archival research as a way to collect data about the history of tanks in India, myths and metaphors around water, as well as its religious implications. The purpose of using this methodology was to gather stories, narratives, and histories, and juxtapose them with the colonial and post colonial narratives of the same water.

3. CAUSAL LAYERED ANALYSIS

Causal layered analysis (CLA) is offered as a new research theory and method (Inayatullah, 2004). It was designed by him, and as a theory it seeks to

integrate empiricist, interpretive, critical, and action learning modes of knowing... Causal layered analysis consists of four levels: the litany, social causes, discourse/ worldview, and myth/metaphor (Inayatullah, 2004).

Layer (CLA)	Quadrants	Lines	Levels
The litany	Behavioural Systemic	Multiple lines considered in the content (e.g. population, consumption, technology trends)	Multiple lines considered in the content (e.g. social, technological, economic, ecological, political developments)
Systemic causes	Behavioural Systemic (mainly)	Multiple lines considered in the content (e.g. social, technological, economic, ecological, political developments)	Analysis emanates from average to below-average levels of consciousness (e.g. concrete operational to formal operational cognition)
Discource/worldview	Cultural	Discourse Worldview Stakeholder interests Ideology Episteme	Discourse and episteme are concepts that emerged from postmodernism and a postmodern level of consciousness may be required to fully understand and employ these concepts
Myth/metaphor	Cultural	Myth Metaphor Symbols	While there are myths, metaphors at all levels of consciousness, it is only at post-conventional levels that one is able to reflect on and compare these myths and metaphors

Figure 3: Breakdown of Inayatullah's Causal Layered Analysis (Riedy, 2008)

Causal layered analysis is concerned less with predicting a particular future and more with opening up the present and past to create alternative futures. It focuses less on the horizontal spatiality of futures—in contrast to techniques such as emerging issues analysis, scenarios and back- casting—and more on the vertical dimension of futures studies, of layers of analysis(Inayatullah, 1998). It highlights the hidden agendas in current structures, that are a result of the uprootment of indigenous knowledge by colonial ideologies.

I chose to use CLA over some of the other foresight methods because it steps away from a linear way of looking at futures, and instead focuses on the complexity of it. I used a critical approach to deconstruct this method, while trying to find answers for the following question:

How might we design more inclusive foresight tools to incorporate language, vocabulary, and the multilingual nature of the non – western world – to reclaim knowledge systems and design practices?

A CONVERSATION WITH DR. DILIP DA CUHNA

Dr. Dilip DaCuhna has co-authored multiple books with Dr. Anuradha Mathur, and below is a short excerpt from our conversation around their books Deccan Traverses, Soak, and one that they are currently working on, transcribed by me.

They never understood the tank, they often called it lakes and treated them like so. But I think the most important thing is that they called these tanks out with a definitional line. What really distinguishes the Tank system and to some extent the minds of people is a gradient, and not a line. Whereas a line divides water from land, a gradient constitutes a completely different imagery. If you look at the original tank system, as the water receded, plants would grow. So there was no blue and brown, it was basically high ground or low ground operating in this relativism.

In an article we just sent out for publication titled Landscape Precedes Nature, we're saying that when the Colonizer made the effort to translate the Native's language to their own, they also translated the Native's place to landscape. So all the terms that we speak around, whether it is the tree, or whether it is the river, or the see, or land, these are all concepts that are all foreign to the Native's place. The Native is actually looking at place on the ground of rain. They did not divide between land and water, they did not divide between wet and dry; they did not have a term like land. These are all terms that have been coined post colonization, and I look at Colonization going back to Alexander. It is colonizing by geography.

Deccan Traverses was really our introduction to Colonialism. We had never really gone into post colonialism especially in India. For some reason when we took on Bangalore, and we've always hated this idea of a 'City' that has never fitted India - the urban and rural divide which is a colonial insertion. I realize that it was our

engagement of the present, rather than any engagement of the past that helped us design the book the way we did - here we looked at these initiatives undertaken by the British and tried to open up the imagination behind it because these people did not care for how the natives are looking at it. So it's like they were consciously translating a native's place. They were actually just doing their own thing, coming to terms with their own place, and then they translated the native's terms onto their own. They did have the imagination to develop their own language from design, which is what we learnt from and used as a tool ourselves to rewrite the design of Bangalore. We did not want to go back and embrace the past, we wanted to develop a current, but when we spoke about tanks, that eluded the mindset of the British, and their imagination - we said that there were seeds over there for another imagination. That doesn't mean that we have to return to that past, because there is no 'that' past without a colonial inbetween. So let us develop a new language that builds in some way on the dissonance between a tank and a lake, between a city and trajectories, picturing and circumambulating.

We found the imagination behind Colonial enterprises and we said that we should follow it analogously, in the sense and see what a new imagination could lead to. If their imagination could lead to colonizing structures our new imagination could lead to liberating structures. We developed this more in Soak where be became more conscious of the post colonial argument, and as designers we try to demonstrate the possibility of a new imagination, and so in Bombay we tried to take it a little further and we said, " what if the people in India do not live on an island city called Bombay, and they live in an estuary called Mumbai. By changing the ground where the sea is an insider, and the monsoon is an insider; rather than an island where the river is a resident and rain becomes an outsider. If we change that, it means rewriting the past, and rewriting the future. So the native place was an estuary, whereas the colonial place was an island. But again, in this case it was

our present that led us to a different past and a different future. And that is why we're now working on Ocean of Rain where we're looking at how place is actually so fluid and gradient. The Nalla in a linear language is a drain, and that is India has been driven to be a graphic circus; it can be colonized, it can be articulated in plan, in maps. On the other hand you have Sindhu which is an ocean of rain - I Literally translated an ocean of rain because Sindhu is raindrop and Sindhu is an ocean - because everybody has been translating it into a geographic ocean, even though it's really an ocean of rain - and Sindhu speaks of the nalla not as a drain but as a low ground exactly where the tank then comes in, so then I construct in the nalla; I don't make a nalla, I construct a nalla.

There's an eminence in Sindhu, just like there's an eminence in the estuaries, and there was an eminence in Bangalore as we saw it where the person engaged is within the environment as opposed to a transcendent position - on the other hand where the river is designed outside of yourself, an island is being designed outside, Bangalore is being designed as a city that can have a master plan, and that can have a history, so Anupama and I are actually moving away even from the notion of a history and saying that past does not gather as a flow that comes to you, the past actually holds in the present - an indegenous person doesn't actually write their history, they don't believe in a history; their ancestors live in them so they have an extended now, rather than a past and a future. This is where we're coming out with a radical present in The Ocean of Rain beginning to see this whole possibility of a paradigm that is grounded in a completely different sense of our engagement with the present.

This way we marginalize all the post-colonialist and colonialist as grounded in India, while what we're doing is arguing for a Sindhu, where the possibility becomes vastly open to an alternative.

TAKEAWAYS:

- The original tank system operated in this relativism between high ground, and low ground, instead of water, and land.

- The importance of rewriting the past, and rewriting the future.

- The Native looks at place on the ground of rain instead of dividing it between land and water, between wet and dry.

- The past does not gather as a flow that comes to you, the past actually holds in the present.

- If a colonial imagination could lead to colonizing structures our new imagination could lead to liberating structures.

THE CURRENT IMAGINATION

Before seeing what a new imagination could lead to, I wanted to first understand the past as we know it.

I used Tanks and Irrigation in Karnataka: A Historical Survey (1993), authored by GR Kuppuswamy, GS Dikshit, and SK Mohan as my main source of information. This survey provides a historical overview of tank irrigation, using archaeological information, inscriptions, indigenous literature, travellers' accounts, and state documents (Kuppuswamy, Dikshi, and Mohan, 1993). It was intentionally chosen because various types of sources were used to create it, instead of just archeological information.

At the end of my findings, I used the STEEPV method (STEEPV is a brainstorming tool which is an acronym or mnemonic that refers to Social, Technological, Economic, Environmental, Political and Values based factors that provide a starting point for strategic discussions about the future) which is typically used to find trends in foresight, to identify the language of design in the pre and post-colonial past.

PRE COLONIAL PAST	
Society	**Communal Mindset:** Tanks were shared by the entire community which benefited from it, instead of a single individual.
Technology	**Science meets Religion:** These Tanks were complex builds, that reflected the temporality of pre-colonial structures which water flowed in, vs being held in
Economy	**Shared economy:** Resources were shared, and the Tank supported the entire place, helping with irrigation and farming.
Environment	**Relativism:** There was no Tank and land, but high and low ground that chnaged, and was adapted by its people.
Politics	**Caste System:** The caste system was a barrier to change, but there were leaders who were able to build a certain level of trust, and resources were shared.
Values	**Way of Life:** This was not a task or chore, but a way of life. People were giving, and the Tanks were inclusive in its design.

Figure 4: A STEEPV of the traditional tank irrigation network developed based on my findings stated below

1. TANK IRRIGATION IN KARNATAKA: THE TRADITIONAL WAYS OF LIFE

Chalcolithic and Megalithic people were the earliest to build reservoirs... came to occupy South India soon after 1000 B.C (Kuppuswamy, Dikshi, and Mohan, 1993). This did not come as a surprise to me, considering how advanced Indians have been in building civilizations with advanced technology - The Indus Valley

is of course a great example. Even in India, it is usually the North that is heavily researched, documented, and talked about. It is popular. It is the Taj Mahal, and Delhi Sultanate, the Ganges, and the Himalayas. Often, the inventions and creative minds of the bottom half of India is left untold, which is why this part of the research has one primary source that took months to find.

> ...Sakiya and Koliya tribes had constructed a dam across the river Rohini, which flowed between the cities of Kapilavastu and Kolia... The waters from this dam were utilized for cultivation of crops... Restricting the area to be supplied with water when supplies were short, was the arrangement adopted (Kuppuswamy, Dikshi, and Mohan, 1993).

This shows how communal the traditional system was. It thrived on the idea of sharing, and trust. The system was built around the Tank, and the rules changed based on the time of year. This practice of sharing the available waters and the irrigable land in a cooperative manner is reported to be in operation since a long time (Kuppuswamy, Dikshi, and Mohan, 1993).

There was immense respect for the water that provided them with so much, and helped these village communities survive. They did not treat it like a mere commodity, but almost worshipped it.

> The Rajagundlahali inscription of Mulbagal taluk (1496), ...which is an arrangement between the temple and the builder of the tank, tells us that if the tank were not filled sufficiently for irrigating the dasavanda lands given to the builder under the agreement, he shall also take his turn for receiving water from the tank. These inscriptions indicate that efficient water management under tanks was well established even in the medieval period (Kuppuswamy, Dikshi, and Mohan, 1993).

There are also a number of literary sources that have documented this form of irrigation systems. Kautilya's Arthashastra (c 300 B.C.) says that the king shall construct dams or reservoirs filled with water either perennial or drawn from some

other sources, or he may provide sites, roads, timber, and other necessary things to those who construct reservoirs of their own accord (Kuppuswamy, Dikshi, and Mohan, 1993).

The author of Mitakshara says, “The construction of a dam to a waterflow should not be stopped by the owner of the field even though it destroys another’s land provided it causes only a little injury and is productive of much benefit to many (Kuppuswamy, Dikshi, and Mohan, 1993). Mitakshara’s saying might sound a bit extreme, but it highlights how very important tanks, and tank irrigation were to the people of Karnataka - why then is it so different now. It is important to know that Karnataka still needs its Tanks, and if the tanks had kept their ancient forms, Bangalore would probably not be facing such a water crisis. So what happened? How did we move from this abundant source of water, to headlines like, 2020 the year Bengaluru runs out of water (Rajaram, Kumari, 2019).

The period from the last quarter of the tenth century to the thirties of the fourteenth century (roughly about 350 years) formed the golden age of tank construction (Kuppuswamy, Dikshi, and Mohan, 1993). This period is where we see the connection between the tanks and the temples it was built around. Prior to this, we do not see a lot of connection between religion and tanks, except the Mulbagal taluk mentioned earlier, but even there, it was more of a strategic, and transactional connection, rather than religious. Kuppuswamy, Dikshi, and Mohan talk about this new relationship, and mention that:

> In fact, all the institutions, agragarasatra (rest house), tanks and temples were interrelated. When a village was formed, the primary requisite was water supply and if a river was not nearby, it was taken care to see that a tank could be constructed in the village. Whenever a tank was constructed and after its construction was over, as something like a thanksgiving, a temple was built close to the tank. Sometimes when a tank breached, the temple provided funds for its restoration. It also took a leading part

providing irrigational facilities because temples owned large areas of land. There were many wars that were fought, especially between the Mughals and the different rulers in the South between 1636 and 1799, but as Kuppuswamy, Dikshi, and Mohan (1993) have pointed out:

> After the defeat of Tippu in 1799 and the Peshwas in 1818, the whole of Karnataka came under British rule...After the British took over the administration of the State in 1831, the system of maintenance of tanks by the village community which had received a setback in the earlier period, due to frequent wars, suffered a further blow, due to their system of village administration. Further, the British concentrated on repairs and maintenance of larger tanks and river channels, which gave them assured revenue.

THE PLACE AND ITS PRACTICE: I lived in Bangalore from 2011 until I moved to Toronto in 2018, and I never realized until now the fact that there was always a temple very close to every tank I passed. I lived next to Ulsoor lake, one of the bigger tanks in Bangalore, and there were multiple temples, both old and new surrounding it. Of course Indians have always had a very deep connection with water, and worship it as one of their Gods, but I realize now that it was not just religious, but also a calculated move - a symbiotic relationship where both benefited from each other.

Kuppuswamy, Dikshi, and Mohan (1993) also talk about the stakeholders, and the ones in charge of this entire system, the ones creating these rules and issuing orders to the rest of the villagers:

> The institution which was overall in charge of all these organizations was the self-governing village or town assembly, an association which flourished in this period as never before or after, in the history of Karnataka. Leadership was provided to it by the Gaundas or village headmen. The towns also had representative institutions called Nagara or Sreni and their leaders were

known as Nagarasresthi or Pattanasresthi, who also took a leading part in building temples and tanks. For groups of villages or nadus, the leader was nadagaunda.

The Language of Design in pre colonial Karnataka highlights a system that is completely different from the current one. This was a language of trust, community, and complexity. It did not try to simplify in order to fit everything in a linear grid of 'order'.

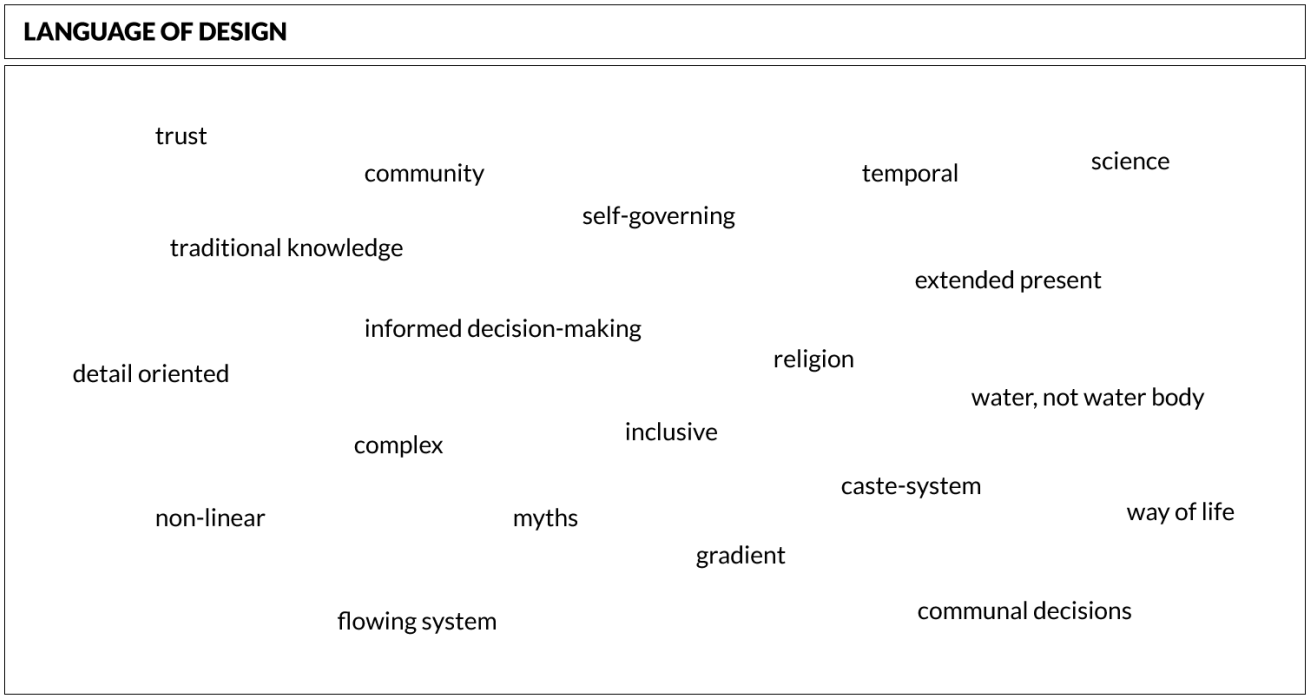

Figure 5: A word cloud of the language of design in pre colonial Karnataka

COLONIAL PAST	
Society	**Individual Mindset:** The Tank and its benifits were unequally distributed based on power and land ownership. There was no collective gain.
Technology	**Pseudo Science:** The British did not understand what the Tank system stood for, and so they kept building bigger structures that were more permanent.
Economy	**Money Hungry:** The Government only took, and there was unequal distribution of wealth. It was profit driven, and created a disconect between Tanks and its people.
Environment	**Takeover:** Water became a water body, and temporality was gone. The systems were oversimplified, which resulted in reccuring colapse of the Tanks.
Politics	**Segregation:** Some people were given pseudo power based on land ownership. The wealthy become power hungry, and bribery became the norm.
Values	**Money:** What was once a way of life became a task. People valued money, and everything became transactional. 'Bigger the Better' was the new motto.

Figure 6: A STEEPV of the colonial tank irrigation system developed based on my findings stated below

2. COLONIAL INTERFERENCE: FROM A LANGUAGE OF COMMUNITY, TO THE LANGUAGE OF COMMODITY

Under the British, at the season of cultivation, the shekdar made a tour of the village in his circle, advised and directed the shanbogs in their assignments.

> In this case of lands under tanks, he ascertained the portions which were to be under sugarcane and under rice and should the supply of water be insufficient to bring the whole of the Sarkar (Government) lands under full wet cultivation, he arranged for the production of the most remunerative dry crop on the portion which would remain wholly or partially unirrigated (Kuppuswamy, Dikshi, and Mohan, 1993).

This was obviously different from the way Tanks were treated in the pre colonial era. The British came and started new policies that benefited them, and took power away from the panchayat heads who previously had made sure that new tanks were being built, and old ones maintained. The reduction of the inams (prize money) of the patels/shanbog (land owners) and revenue assessment of the lands direct by the Government, resulted in the loss of stature and position of the patel in the village. He was reduced to a mere paid-servant of the Government and could not force the villagers to undertake the repairs of the tanks. He also lost the personal zeal or interest in getting such works done (Kuppuswamy, Dikshi, and Mohan, 1993).
People have this idea that the British did not touch the South of India, and only dominated the North, which is not true - and just by looking at how the Tank system changed, you can see the amount of influence the colonization has had on it. Of course they completely broke a functioning system, even if it was not perfect to begin with - I know that the panchayats were imperfect, but it had stemmed from years of tradition and traditional knowledge systems, which the British broke, just like they did with the Zamindars (landlords) in West Bengal, but that topic is for a different day. Once the patels/shanbog started to fail, the British had the perfect opportunity to take over. It transferred the responsibility from the village community to the Government (Kuppuswamy, Dikshi, and Mohan, 1993).
Since it became a difficult task to take up the repairs or restoration of all tanks, a proclamation was issued in 1863 by the Chief Commissioner of Mysore permitting a private individual who undertook repairs or restoration of a tank long in disuse,

to hold the lands irrigated by it (Kuppuswamy, Dikshi, and Mohan, 1993). But they obviously did not think this through, because they kept modifying this order - without once trying to understand the traditional system, and its original users. There is so much history, culture, and language attached to these keres (kannada word for tank). The language of design, that carried with it instructions from their ancient builders - that translated so seamlessly into the traditional ways of life. Disrupted by the English Language. The beauty of the vernacular is many things, but one that immediately stands out is its connection with the ones who speak it - the bond, a way of life. It is in their blood; in their morning prayers, their first words. It is in the pain; sometimes oppressive, but mostly rewarding. A Hampi inscription of minister Lakshmidhara describes how he was motivated to build tanks and dig wells by the lullabies sung by his mother while feeding him with milk (Kuppuswamy, Dikshi, and Mohan, 1993). The English Language overtook the vernacular. First slowly, and then all at once; disrupting everything in its path.

Meanwhile in 1873, having realized that it was impossible for the Government to undertake the repair and maintenance of the thousands of Tanks in the State, it was considered necessary to had over to the villagers such tanks as were either already in a state of efficient repair or had been restored to the required standards (Kuppuswamy, Dikshi, and Mohan, 1993). What the Government failed to do was ensure that the people taking care of these tanks felt attached to them like they used to before the new rules were imposed. The new system was a Western on - a vertical hierarchy where each level was responsible for the one below it. This system too failed. According to Kuppuswamy, Dikshi, and Mohan, in spite of these rules, it was observed that the maintenance of tanks was neglected due to the disappearance of community spirit in the villagers and due to slackness of the village officers entrusted with enforcement of the rules. In a culture that used to thrive on its sense of community, by removing it and replacing that with hierarchy, and regulations what was once a communal activity had become a chore - involving

bribes, and a power struggle.

This lead to the formation of the Tank Panchayat, under the Tank Panchayat Act of 1911, where an elected body consisting of members of the village would have some control over the decisions around the tank system, and its maintenance. Government felt that a remedy would be to enlist the co-operation of the people of the village by giving them a voice in the measures necessary for the maintenance of their tank and powers to execute the necessary work with control over funds that might be set apart for that purpose, so that they might feel that the work was not one in which the Government alone was concerned (Kuppuswamy, Dikshi, and Mohan, 1993) - to roughly translate, the Government wanted to now go back to how things originally were, before they decided to change it all up without consulting the village elders, but they only gave them limited power. What I think they failed to understand is that by switching back and forth, they had shown these people what the power of money could do. They had created a divide between the landowners/ carers, and the rest of the village. Once you install a system of hierarchy, it is not easy to go back to a panchayat- style democracy. This effort was also a failure. Enforcement of the customary obligations by the patel, or the Village Head was not possible as he had been reduced to a mere titular head, one among the many paid servants of the Government (Kuppuswamy, Dikshi, and Mohan, 1993). Another simultaneous change that was happening as a result of this colonial damage was urbanization and the emergence of a class. Patel was no more a resident of the village but was living in a close-by urban centre. (Kuppuswamy, Dikshi, and Mohan, 1993). The wealthy started to move to these centres because of the development of social and economic groups or factions in the village...Also due to a large growth in population/ and due to greater economic and social prestige and power in the urban centres, most of the large, well-to-do landholders migrated to urban areas, leaving the care of their lands in the hands of their trusted labourers (Kuppuswamy, Dikshi, and Mohan, 1993).

The Government then put forward a series of Acts that would allow them to once again take over the system This was in 1932, closer to India's independence from the British in 1945. I could not gather information on how it transitioned from the British Government to the Indian, but the new Government did alter the 1932 Act. A clause was introduced in 1952 in the Mysore Irrigation Act of 1932 that in respect to all such tanks whose maintenance would be taken over by the Government, every landholder in the area benefited by the tank shall pay a sum of three rupees per acre per annum to Government as maintenance cess in addition to the assessment fixed land revenue (Kuppuswamy, Dikshi, and Mohan, 1993).

THE WESTERN NEED TO INTERVENE, CONTROL, AND FIX:

> The early colonial project involved the demilitarization of former warrior kingdoms, the consolidation of power through the selective allocation of rights in property, and the extraction of a punitively high tribute. In Ramnad and Sivaganga this took the form of a "permanent settlement" in which selected Maravar-caste warrior-rulers were instituted as holders of proprietary estates, or zamindaris; were required to pay a fixed tax to the government; and were expected to profit by reaping the rewards of investment in the region's tank-irrigated rice production through their collected rental share. One English officer put it: "By liberal and regular appropriation [for irrigation] of a small proportion of the revenue the produce and value of these districts may in the course of a few years be greatly increased and the country relieved from the present declining state" (TNSA, diary of the superintendent) (Mosse, 2006).

If we were to take a step back and filter this to just language, and what the English language did, it was this: it took over the vernacular that had built a community around tanks, and commoditized it. The way I see it, they took a large joint family

and split it into multiple nuclear ones fighting over the same property, and gave some more power over the others. Language did this, because they were not willing to listen to years of vocabulary built from the act of doing, to create best practices around tank irrigation and maintenance. You needed to have a Nigranti (watchman of tanks), and not a rich landowner who is only looking to make money, to take care of these tanks. By giving this responsibility to land owners who could dominate the rest of the village and profit from them, the language of trust and equality, and community, became a language of money, power, and segregation.

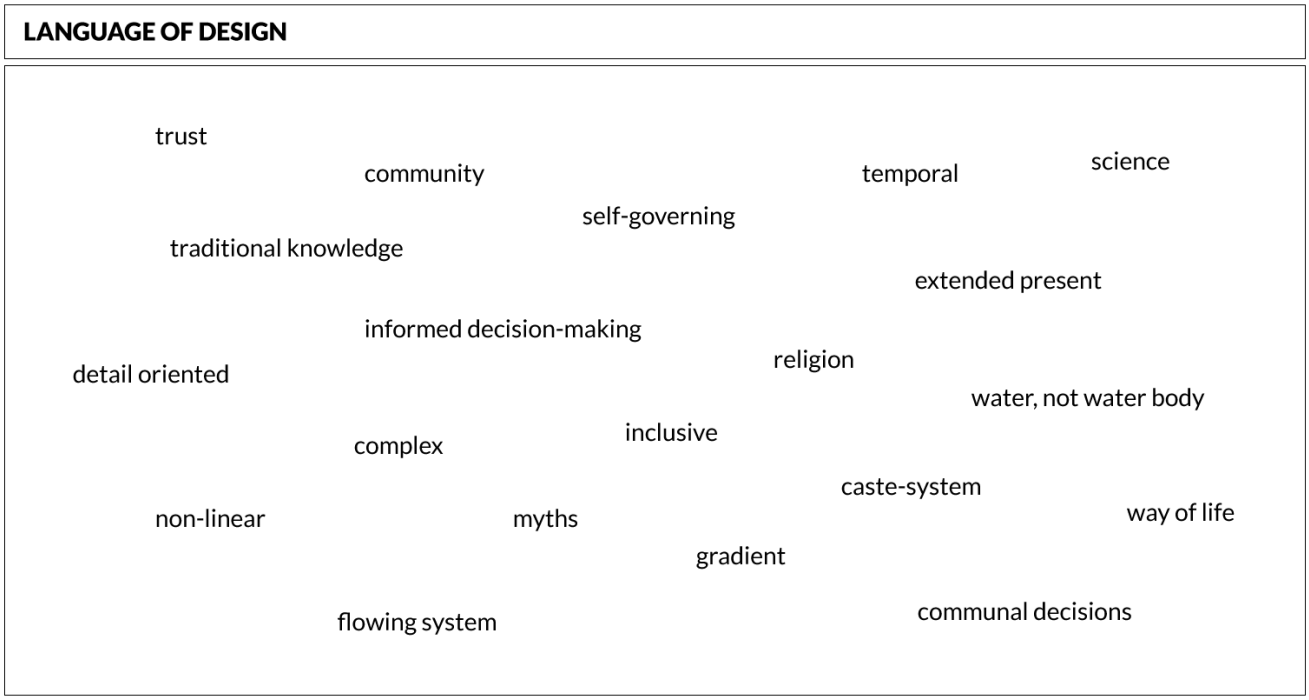

Figure 7: A word cloud of the language of design in post colonial Karnataka

Causal Layered Analysis (CLA): UNDERSTANDING THE CURRENT LANGUAGE OF DESIGN

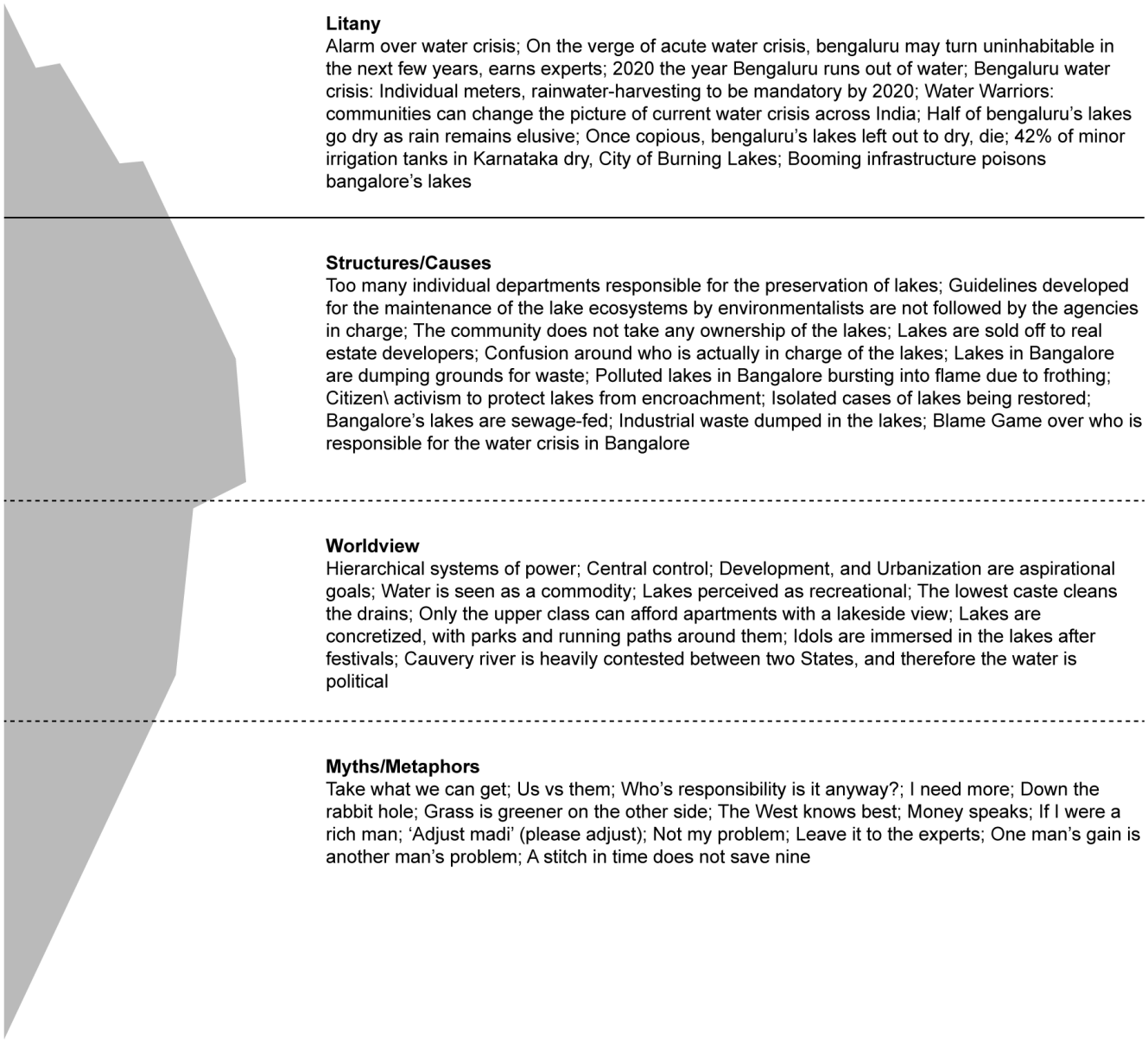

Figure 8: A CLA of the current imagination of the water crisis in Bangalore

A CLA to understand the water crisis in Bangalore, highlighted the mental models behind the current language of design being used. Causal layered analysis asks us to go beyond conventional framings of issues (Inayatullah, 1998), and in this case, it provided several key themes by peeling off the different layers that constitute the challenge. The metaphors brought to light the deep stories, the collective archetypes, the unconscious dimensions of the problem or the paradox (Inayatullah, 1998), and revealed the shift required to reimaging the language of design, both in the case of Tanks in Bangalore, as well as in the design of tools in foresight practices. I identified three key factors that formed the basis of the current mental models:

1. WHAT'S IN A NAME?: A lake is a western language of water, in which water is contained or held; whereas a tank is a structure that allows water to flow through it. It is temporal, both in structure (made up of clay), and in its role (water levels would change depending on the season, and crops would grow in the areas where the water receded). It was designed for a specific role; primarily to provide water for irrigation, to be used as drinking water, and as a part of religious processes. Most importantly, it was a part of a larger system of catchments, nallas (open drains), channels, and anticuts. The colonial renaming of these tanks have led to a shift in its functionality; it is called a lake and therefore is being treated like one. Having said that, changing the name is not enough; one needs to then bring back the functions associated with that name. To give an example, Bangalore's name was officially changed to Bengaluru on November 1st, 2014, to reclaim it from its colonial name; but they did release the 'city' from the colonial concept of a city with an urban-rural divide, nor did they bring back the water systems. Bangalore is known as the silicon valley of India, and Bengaluru will continue to be just that until the vernacular name lends itself to a vernacular design of the place.

2. THE CAPITALIST DREAM: Let us go back to what Bangalore is called - the silicon valley of India. What that name brings with it is a fast rate of urbanization. Parts of the city that were still 'rural' when I moved there in 2011 have now been developed by real estate agents. Water bodies have been overridden by condos, and artificial water bodies have been built for the 'view'. The language of design here has been borrowed from the Capitalism, and the goal is to make the city as urban and 'modern' as possible. This includes a fast paced lifestyle, and a lack of 'free' time. The existing tanks are seen as recreational, as opposed to functional bodies of water that play a larger role in the environment. In keeping with the same theme, another mental model that needs to be uprooted is similar to this idea of a 'smart city' (Mathur, & DaCuhna); it is concretizing everything. Tanks were built out of materials that were as temporal as the water that it carried. Now, concrete has become a symbol of 'modern', and permanent structures are replacing mud, clay, and soil.

There is also a very strong caste system, supported by classism, that has overtaken the community at large. Not all communities' voices are heard equally, and they are the communities that have used the tanks as a means of livelihood. Therefore even the 'community driven' efforts are not inclusive, and this highlights the unequal distribution of power even within the communities.

3. FRAGMENTED EFFORTS: Historically, lakes were managed by surrounding communities, sometimes with administrative and financial support from local rulers (Rice, 1897). While there is ongoing community led activism to protect the tanks, they are fragmented; restoring a few lakes. Unlike lakes, tanks are a part of a whole; a network of water bodies connected to each other through nallas (open drains) and catchments. Therefore, restoring them like individual lakes, while still treating the nallas as sewage drains will not restore the tank network. Furthermore, there are a lot of departments responsible for different aspects of the maintenance of

these tanks, and sometimes an overlap in jurisdiction. This, along with the lack of dialogue, and collaboration between the different stakeholders has resulted in the inability to look at the structure of the tanks as a whole.

At present there is no collective; there are individual stakeholders with different (and at times opposing) goals, and even though they have a shared history, and identity; that does not reflect in the current imagination. The rigid structures that define Bangalore are still reflective of colonial influence, and therefore there is a need to reimagine the present, to change the past and the current future.

Causal Layered Analysis (CLA): REIMAGINATION OF THE LANGUAGE OF DESIGN

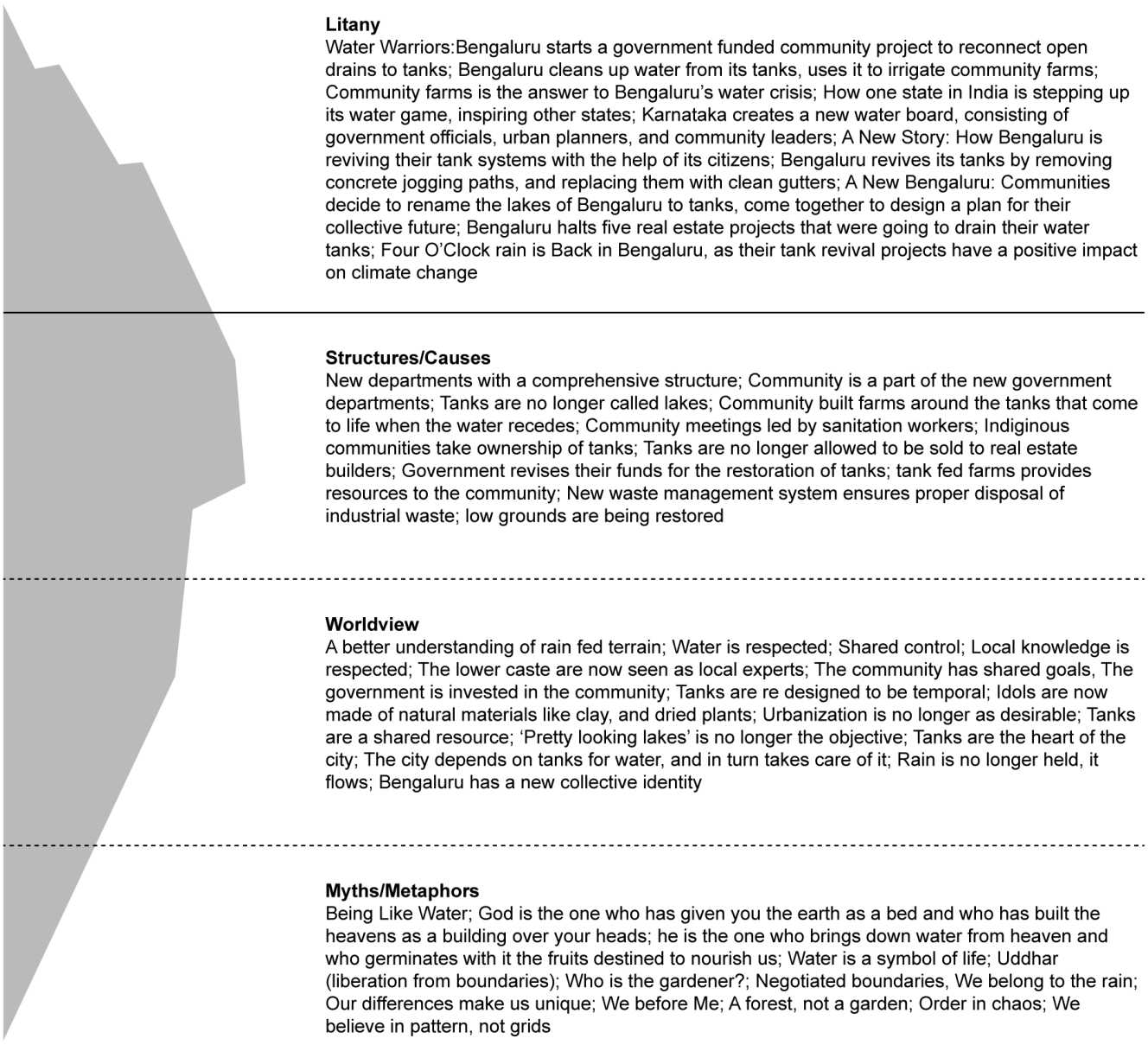

Figure 9: A CLA of the reimagination of the water crisis in Bengaluru

A CLA, but this time based on a reimagined language of design brought to light the contrast between the current imagination of the water crisis, and a different possibility. Both result in different futures, but starts with the reimagination of the present. While the current imagination uses colonial design practices, the reimagined present changes the language of design by reclaiming local knowledge; and in doing so also alters the narrative of the past. Here, I took the three mental models that I had explored in (page), and reimagined them in this version of the present, to further identify how to flip the mental models:

1. THERE'S A LOT IN A NAME: Changing Bangalore's name to Bengaluru presents a unique opportunity to reclaim the narrative. Bangalore is colonial; with lakes, closed drains, pretty gardens, and a business hub. It is 'pretty', it is a 'city'. By renaming its lakes, and treating them as tanks, Bengaluru can remove itself from the dominant culture's influence over its future. This would involve reviving the entire tank ecosystem, not just tanks; and moving away from the 'structure' of a city, to the pattern of a terrain. Reintroducing indiginous vocabulary into the design will also allow people whose voices are normally not heard, the opportunity to contribute to the process in a meaningful way. By leaving behind the current language of permanence (lakes), and embracing the language of temporality (rain), Bengaluru will have the opportunity to design a better future.

2. EMANCIPATION OF THE LOCAL: The current language of design looks very similar to our colonial past that was explored earlier in this project (page nos.). The urban-rural divide that was introduced then is still prevalent now; as is the class system, the top-down method of governance, and urbanization. It is a design that did not work. If the current decision making is based on a failed system, how can the futures it supports be desirable? There needs to be a change in the way we view what is 'local'. Local practices, knowledge, and cultures need to be celebrated

instead of being undervalued. I would argue that this is an impassable imperative if Bangalore is to truly become Bengaluru. Tanks need to be viewed as functional carriers of water, that serves a bigger purpose than just being recreational, and the idea of what looks 'beautiful' needs to be revisited. Why is a concrete lake with running tracks, and man made parks deemed 'beautiful', but a tank not? The Tank ecosystem can be revived using local knowledge, but freeing oneself from a colonial way of thinking can be very challenging, especially because of how dominant its presence is in most cultures. Perhaps a good place to start is to allow indigenous, and local voices to be heard, by acknowledging their expertise – and combining current strategies with indigenous knowledge to highlight the effectiveness of what is local. By drawing from the 'local', communities can find other directions to reimagine alternate futures through a different lens; one that acknowledges their culture, and gives them an identity of their own.

3. COLLECTIVE EFFORTS: Pre colonial leaders were a part of the community, and their decisions were influenced by the relationship they had with the other members, as well as their connection with the tanks. Having said that, the picture of 'the perfect community' that has been painted by a lot of modern scholars is not entirely true.

To give an example:

> The labor for tank construction seems to come primarily from the Vodda caste. The stories narrated by higher-caste farmers and temple priests and the songs sung by Dalit women commonly describe the large number of Voddas employed for tank construction. For example, in the folksong 'Kanne Viramba', a village chieftain invites seven hundred Voddas to build a tank. This song was sung to me by a group of Dalit women from the village Dannayakankere, which is located close to Hampi, the erstwhile royal capital of the Vijayanagara empire. In another such song, 'Kere Hunnama', the chieftain enters into a lengthy and arduous negotiation with the leader of

three thousand Voddas (Rajappa, 1974) (cited from Shah, 2012).

The class-caste system has been present as a part of the culture for a very long time, and while that is a mental model that needs to be challenged, what it has provided us with experts (albeit unintentionally). Voddas, who were responsible for the actual construction of tanks, and Dalits who are still responsible for the maintenance of the sewage system, and since they are born into that caste, they have access to knowledge and skills that have been passed on for generations. By finding leaders in the community, and involving them in the decision making process, people can reconnect with this tank ecosystem. In order for the tank system to survive, and provide water to Bengaluru, its people have to first form an alliance that pushes the collective need before any individual requirements. They have to reevaluate what community means to them. Harvard Business School talks about being an 'expert' as Real expertise must pass three tests. First, it must lead to performance that is consistently superior to that of the expert's peers. Second, real expertise produces concrete results. Finally, true expertise can be replicated and measured in the lab (Ericsson, Prietula, and Cokely, 2007). The definition comes from a western school of thought, and is limiting in its definition. What if these local experts- sewage workers, farmers, the ones who maintain the lakes were given the opportunity to to share their knowledge along with scientists, and environmentalists, policy makers, and designers? This would create dialogue between the community, and allow them to collaborate as stakeholders, instead of having to follow policies and laws assigned to them. This new tank ecosystem would create a sense of culture, and provide the community with a collective identity. By redefining who an expert is, voices that are often left out of conversations will be able to contribute, and have a say in decisions that are often made for them. Overall; Bengaluru, with its reimagined language of design will be able to create many possible futures for itself. Futures that are inclusive, that respect what is local, honor the community, and draw on the value of its culture(s).

USING CAUSAL LAYERED ANALYSIS

1. STRENGTHS: Causal Layered Analysis as a method provided different levels of analysis, instead of just looking at it from one perspective. It was able to capture the cultural nuances, and highlight the barriers to change at different levels of decision making. It allowed for the use of a critical approach, while providing enough space to find new meanings.

CLA also provided the tools to imagine multiple futures, before highlighting the desired one(s). It helped identify the knowledge structures at play; the ones that form the basis of most societies.
Inayatullah (1998) designed the CLA to be used by a wider range of individuals as it incorporates non-textual and poetic/artistic expression in the futures process. This still holds true, because the method is non restrictive in its form, and I could have captured my findings verbally, with the use of visual imagery, song, or in writing. It is adaptive in nature, and allows for the user to play around with it. This also makes it a useful tool in participatory design practices, as it can accomodate the needs of the participants.

2. WEAKNESSES: However, one important aspect of design that the CLA does not address is the individual. As Riedy (2008) points out, in keeping with its poststructural roots, CLA gives little attention to the individual subject. It focuses on the collective, but does not give the individual the platform to reflect on their own lived experiences, and perspectives of the past. While collective futures are important, there needs to be a space to capture individual knowledge, and lived experiences. In a participatory workshop setting for example, each individual, or groups of stakeholders should have a voice that is captured through this method. That layer is currently missing. While Riedy calls it the ‘psychological’ layer, because

it would provide a platform for individual opinions, and discourse; I would argue that this layer needs to capture individual 'values', and 'experiences'.
While the use of Myths/Metaphors is great, especially for participatory design practices, there is no room to explore each myth/metaphor, and expand on them to understand the underlying problem further.

3. OPPORTUNITIES: This opens up the opportunity for futurists who are interested in the design of more inclusive, and equitable futures, to redesign the CLA in a way that provides a layer for the individual.

In the scope of this project, the CLA was used by an individual, with an expert-led approach. But, it can be used in a workshop setting, with a participatory approach. In fact, I would argue in favour of a participatory approach, where marginalized voices can play an equal role in the creation of many different futures. For example, community led decision-making has been a part of Bangalore's culture before colonization, and bringing that back in the form of participatory methods would help reclaim the language of design that is desirable.

4. THREATS: The lack of importance given to the individual can result in the focus on only the dominant culture's voices; while the oppressed, and marginalized communities remain unheard. This would defeat the purpose of a method that is trying to be inclusive in nature. It is important to question this method at every stage, to ensure that no one is left out. The language of design needs to be plural in nature, and not 'singular'.

THE BIGGER PICTURE: NOTES FOR CHANGE-MAKERS

One thing that I want to be clear about, is that the use of the Causal Layered Analysis in this project was not to highlight how an expert could use it to come up with solutions for a community. That would be redundant, because it would not change the language of design. Instead, I wanted to show how it could be used by the community itself, to reimagine their futures for themselves. Among the more influential ideas shaping rural development interventions today is the notion that, if given unambiguous and secure rights of access and use, communities are better managers of the natural resources upon which they depend for their livelihoods than are state bureaucracies (Mosse, 1999). The exclusion of certain voices from the generation of desired futures, especially voices that are a part of that future is dangerous. In this project, I asked what the role of language was in the exploration of futures, and it is this:

In order for us to move away from a colonized future, foresight work has to be community-led. As outside practitioners, our role is not to design futures based on the language that we find desirable. Instead, we must give communities the freedom to come up with their own language of design, and let them choose their own futures. This would mean making foresight methods and tools more accessible, and providing guidelines, facilitation, and mentorship to train people within the community so that we can move away from an expert led approach.

It is prudent to expect everyone to be accepting of this new language of design, and the new imaginations that it might create. For example, changing the mindset of ‘modern is good’ is not an easy one. However, one of the reasons why it has become a mindset is because our current education system does not include traditional knowledge in its curriculum, nor does it challenge the notion of who an

expert is. By introducing local knowledge as powerful tools of change at an early age, this colonial imagination can be broken. Just because this Capitalist society is a powerful one, does not mean we should not fight it.

When I joined OCAD, India, where I am from, was referred to as a part of the ‘global south’. Any design that came from the ‘global south’ was automatically a symbol of resilience, or was labelled as ‘frugal’. You see the problem here?

The water crisis is not a problem that is particular to Karnataka, or even India. It is a part of a larger global issue, that is connected to Climate Change, and the Climate Crisis. While the crisis might be similar, the challenges are unique. Therefore, a universal solution to a problem that is not singular would not work. As change-makers, and futurists, ask yourselves what kind of futures you want to advocate for?

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