

**Privatization of commons: Impacts on traditional users of provisioning and cultural
ecosystem services**

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Abstract

The city of Bangalore, India, is well known for its extensive network of lakes, traditionally managed as commons. Although owned by plural state authorities, often with overlapping jurisdictions and responsibilities, they still are accessed by a variety of communities who influence their access and management, thus forming operational commons. Today, many of these lakes have been lost or degraded due to the pressures of urbanization.

In recent years, an experiment with decentralizing management of lakes to private stakeholders was carried out through Public Private Partnership (PPP) models. This change in management meant state led reclamation of commons through restricted access to ecosystem services. Though widely critiqued by civil society and legal machinery, it continues to be operational in three lakes.

Using these lakes to understand the impact of privatization on ecosystem use in urban commons, this paper evaluates differences in land and resource use, by comparing the three privatized (converted commons) with adjacent, non-privatized lakes (managed as community commons).

We contrast land use patterns seen within a hundred meter radius around each lake. We then map the provisioning and cultural uses of these lake ecosystems that are managed using different institutional approaches. The perceptions of users regarding the services provided by each category of lake ecosystems have also been evaluated.

Our results indicate that lakes constituting operational commons support greater diversity of traditional livelihoods and non-commercial uses compared to privatized lakes. Greater pressures of urbanization with pronounced inequities in housing distribution were observed along the privatized lakes.

This study indicates the possible negative implications of privatization in impacting the diversity of traditional ecosystem services provided by commons in this inland city. It also suggests that privatization appears an incomplete solution, one with potential to exacerbate existing inequities in social access to urban ecological services in the global South.

Keywords

Ecosystem services/privatization/ lake ecosystems/ urban commons/ Asia

1. Introduction

The urban landscape has been created through myriad human interactions with nature (Heynen et al, 2006) thus forming megapolises that are characterized by their activity and complexity. They form ecosystems in which the presence of humankind is integral and in many cases quite essential to their functioning. Cities therefore are examples of complex social-ecological systems. Their integrity and resilience are dependent on the smooth functioning of the numerous intertwined ecological and social interactions inherent in their constitutions (Cumming, 2011). Given the anthropocentric nature of urban ecosystems, that integrity and resilience are also functions of the ecosystem services that they provide (Elmqvist et al., 2003; MEA, 2008; TEEB, 2011).

The presence of commons within these urban landscapes is of great importance. Commons, or common pool resources, refer to ecosystems that difficult to enclose or limit access to (difficult to enclose), and where excessive use by one user reduces the benefits available to others (subtractability) (Berkes et al, 1989; Ostrom, 2007). Today urban commons have become synonymous with a range of urban public spaces including lakes, parks, streets, wetlands, and remnant forests (TEEB, 2011). Although state authorities often own and manage these spaces, diverse groups of city residents and communities who also influence their access and management access them. These spaces thus constitute operational commons (Garnett, 2011).

Urban commons are inherently vulnerable to loss of resilience and sustainability (TEEB, 2011), even as their other urban counterparts (D'Souza and Nagendra, 2011). The trend towards rapid urbanization affects traditional community based forms of management that had hitherto prevailed. Where commons persist, their nature often undergoes a drastic transformation from being a consumptive culturally oriented space into one meant purely for recreation and aesthetics (D'Souza and Nagendra, 2011; Monbiot, 1994).

Governments across the world have progressed towards a regime of centralized control services and resources, especially within the context of natural resources and commons (Ades and Glaeser, 2005). The ability of the public sector to provide quality services is nevertheless severely critiqued (Milakovich, 1991; Osborne 1993; Gael, 2010), given the limited ability of often short-staffed and cash-strapped municipalities to effectively monitor, manage and restore these threatened urban ecosystems (Gael, 2010). These lacunae in state led management have given rise to stratagems involving public-private partnerships (PPPs) (Lanjekar, 2009).

PPPs may be defined as as 'the combination of a public need with private capability and resources to create a market opportunity through which the public need is met and a profit is made' (UNEP, 2005). A PPP model allows greater participation from the private sector, especially in roles where the government has originally been responsible. The entry of private stakeholders bring in necessary investments, however, it also results in a hike in the price of the resource as well as its commoditization (Lanjekar, 2009). This further leads to imbalances in the social fabric of communities traditionally dependent on these resources (Foster, 2006). Despite these shortcomings, PPP based models have gained remarkable ground globally (Prager, 1993; Domberger and Jensen, 1997).

The imposition of access regulations following privatization strongly derive from scientifically unconfirmed perceptions that unregulated nature is over exploited leading to a situation identical of Hardin's Tragedy of the Commons (Rowe, 2008). Privatization of public urban resources has undoubtedly been widespread, yet poorly understood (Heynen and Perkins, 2005). Scientific literature is yet to shed light on the impacts and secondary costs imposed on communities because of institutional changes such as privatization (Foster, 2006).

The South Indian megapolis of Bangalore provides a useful context within which to examine this issue. The country's third largest city, with a population close to 8.4 million (Census of India, 2011), also struggles with questions of balancing intense economic growth and expansion with conservation and management of its natural resources. Bangalore, in addition to being the Garden City and Silicon Valley of the country has also been respected for its interconnected network of artificial lakes that were traditionally managed as commons for centuries, but later experienced a transition to government control. In recent years, the commons character of these resources further underwent another transformation when the city experimented with PPPs in a few lakes. This situation provides an opportunity to contrast the differences in ecosystem services provided by privatized and non-privatized lakes, and to assess the influence of privatization on land use within and around these water bodies. Privatized lakes in some sense violate the principles of common property regimes in that access to these resources is highly limited to those who have the resources to pay and appropriate from it. They thus constitute transformed commons in the context of this study.

2. Study area

Bangalore

Bangalore is located in the semi-arid Deccan plateau, in a region prone to droughts and water scarcity. Recognizing this inherent biogeographical limitation of the city, its architects devised a system wherein the city relied on a network of hundreds of interconnected, manmade lakes for its water (Rice, 1897). These lakes have exploited the naturally undulating terrain of the city to form four major watersheds, namely the Hebbal, Koramangala, Challaghatta and the Vrishabhavathi Valleys (Sudhira et al 2007, Mahapatra et al 2011). Inscriptions found around some of these lakes date back several centuries (Annaswamy, 2003; Rice, 1905), attesting to their significant historical and cultural importance for the city. The social history of settlements in Bangalore area is therefore irrevocably linked to its ecological profile, constituting a strongly coupled socio ecological system (Mathur and Da Cunha, 2006).

In addition, Bangalore's lakes have served as cultural spaces for religious ceremonies and rituals; for livelihood services such as fishing and agriculture, as well as recreational spaces for activities such as bird watching (D'Souza and Nagendra, 2011; Sudhira et al, 2007; Sundaresan, 2011). These lakes are now facing severe challenges by way of pollution, encroachment and disruption in connectivity (Narayanan and Hanjagi, 2009). The decline of lakes has also led to ecological impacts such as flooding, urban heat islands, ground water reduction, and the increased incidence of infectious diseases (Prasad et al, 2002, Kiran and Ramachandra TV 1999, Gowda and Sridhara 2007).

The city provides a useful context within which to follow transformations in the social ecological system following changes in governance and management. As with all commons, the issue of lake management and maintenance has proven to be challenging. There have traditionally been a

number of nodal agencies undertaking this responsibility, including the Bangalore Development Authority (BDA), the Bruhat Bengaluru Mahanagara Palike (BBMP), the Forest Department, Minor Irrigation, Fisheries, and Pollution Control Board and the Defence. In 2002, the Lake Development Authority (LDA) was formed, with an aim to consolidate the management of all lakes within the city. Today, this agency is one more among the many that are accountable for this function, consequently making it difficult for one organization to be held completely responsible for the current scenario of declining lakes.

The LDA, which in 2004 decided to lease out lakes to private parties for management. The organization invited tenders for the privatization of four lakes in the city - Hebbal Lake, Nagavara Lake, K.R. Puram Lake (Vengaiahnakere) and Agara Lake. The exercise was conducted without extensive discussions or inputs from the public or community. It was also implemented in the face of intense public opinion against this decision (D’Souza, 2006; ESG, 2008). The lessees were responsible for the overall maintenance of the lake while reclaiming the costs of restoring the lakes through commercial activities aimed at the recreationist user groups.

2.1: Paired public-private lakes

While four lakes were selected for PPP implementation by the LDA, the PPP model did not take off in one lake – Agara – because of legal interventions (D’Souza and Nagendra, 2011). The other three lakes were selected for this study. For each privatized lake, an adjacent public lake of similar size within the same network was chosen. The three privatized lakes identified for the study are Hebbal Lake, Nagavara Lake (also called Lumbini Gardens following privatization) and K.R. Puram lake or Vengaiahnakere (also called Fantasy Lagoon, or Hagalu Kanasina Kere, following privatization). The corresponding publicly managed lakes are Rachenahalli Lake, Jakkur Lake and Kodigehalli Lake or Sadaramangala Lake respectively.

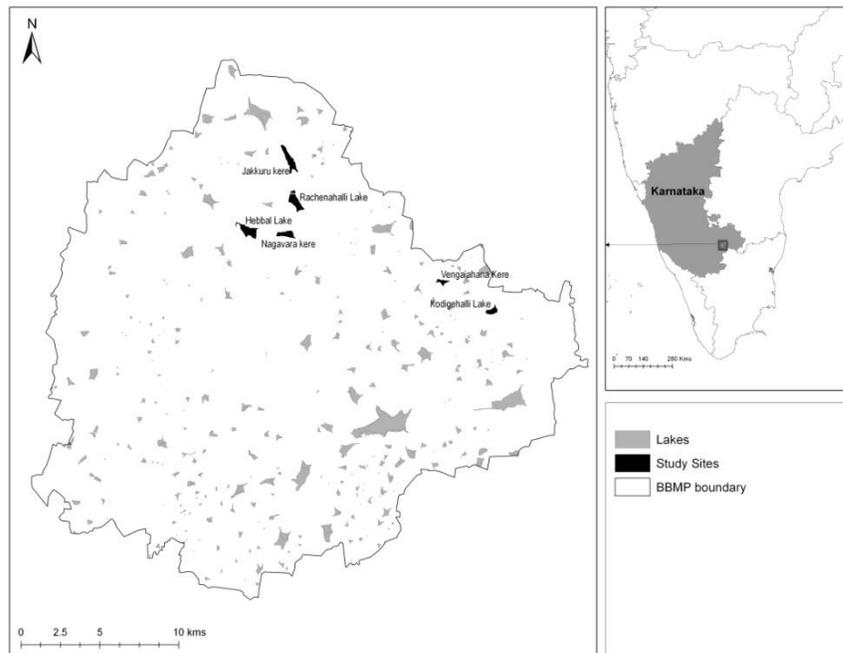


Fig1: Study area

3. Methods:

Field studies were conducted between July-August 2012. At each of the six study lakes, the researchers circumvented the immediate periphery of the lake, also covering an additional area extending upto five hundred meters outside the lake's boundary. Detailed observations were made about the types of land use at the periphery of the lake (within upto a 500 m boundary from the periphery of the lake), paying particular attention to the type of settlements around each lake (high and middle-income vs poor settlements) and the kind of users frequenting the lake. Spatial locations of users and settlements were recorded using a Geographical Positioning System (GPS). Detailed observations of lake users were made, focusing on categories of provisioning services and cultural services, and further categorizing these into livelihood-based uses and non-livelihood based uses (D'Souza and Nagendra, 2011). Livelihood uses of the lake include those ecosystem services derived from the lake that are directly responsible for enhancing the livelihood and income of the users. On the other hand, non-livelihood uses of the lake included those uses such as aesthetic and spiritual benefits derived from the use of the resource. Open ended interviews were also conducted with lake visitors and users encountered, to gain further understanding of their perceptions in terms of access to, and use and management of the lake.

4. Results

The results of this exercise have enabled us to arrive at a conclusion of how privatized lakes in general differ from their public counterparts in terms of land use and the categories of user groups appropriating from the lakes.

Land use: Pair 1: Hebbal vs Rachenahalli

4.1.1. Hebbal Lake: This is a privatized lake that offers a commercial park as an additional service to its users. Following maintenance by the Lake Development Authority and subsequent privatization of the lake, a commercial park has been set up within the lake, which charges an entry fee of Rs. 15 per adult visitor. However, owing to the large area of the lake and the presence of multiple unmanned entry points into it, the entry fee does not appear to be a barrier to entrance into this lake. The area of the lake accessible by visitors is restricted to a portion of the region of facing the Outer Ring Road. Access to most of the lake's boundary is still possible through unmanned informal entry points, but this brings the risk of penalization if found.

The lake is surrounded mostly by commercial enterprises and low to middle income settlements. The parts of the lake that are inaccessible to the general users of the lake are surrounded by fallow land and as well as that belonging to the defense.

4.1.2. Rachenahalli Lake: Also part of the Hebbal Lake network, this is a government managed lake that connects the villages of Rachenahalli, Sriramapura and Dasarahalli. The lake is situated close to three prominent academic institutions, the gated community of Royal Enclave as well as the rural and semi rural and low income settlements of the villages it connects.

The immediate surroundings of the lake are comprised of a pasture land towards the north and east, the Sriramapura village to the west and the Dasarahalli village to the north eastern parts of the lake. Land use patterns are quite contrasting in this landscape with agricultural fields interspersed among houses belonging to the gated community and pasture lands that are flanked by the slums. There are few commercial establishments along this lake.

The persistence of cultural symbols such as lake deities and the temple is revealed in both the lakes. However, within Hebbal Lake, which is privatized, the area of the lake that houses the deities is completely cut off from the users of the lake. Consequently it takes a great deal of effort to even locate the stones that represent them, and entry to this part of the lake is possible only through unmanned informal entry points into the lake, a number of which remain accessible. On the contrary, the wells that persist on either side of Rachenahalli Lake, today supply water for many of the fields situated close to them and these are remarkably plentiful in their water supply. The people who reside close to it and who see it as being an essential resource for their maintenance also bestow this latter lake with a considerable sense of heritage. Further, the area around the Hebbal Lake has been taken over mostly by commercial enterprises on the one hand and low to middle-income layouts and settlements on the other. Settlements very close to the lake and the Fisheries Department are of the very high-income category and the only ones within the hundred-meter radius around the lake that have been covered in this study. The area around Rachenahalli Lake on the other hand, has got a premium layout, the Royal Enclave existing alongside a slum, a couple of agricultural fields, and the low-income Dasarahalli settlement. All of these settlements derive both direct and indirect benefits of association with the lake.

4.1.3 Resource use around the lakes:

Table 1 depicts the various categories of user groups who derive benefits from this lake pair in a comparative manner. It may be seen that the public Rachenahalli Lake supports a greater diversity of traditional uses as well as allows greater access to people within its banks.

Use category	Hebbal Lake (Private)	Rachenahalli Lake (Public)
Livelihood uses	Ground water extraction for agriculture, Commercial park, Fishing, Fodder, Informal commercial shops, Sex work	Fishing; Fodder (both harvest of reeds as well as cattle grazing); Dhobis
Non livelihood uses	Domestic(bathing, washing clothes collection of twigs); ceremonial immersions, Recreational (jogging, walking, alcohol consumption, dating); Naturalists (bird watchers, other nature enthusiasts), cultural (erstwhile worship of lake deities)	Domestic (bathing, washing); Recreational (Angling, walking, jogging, swimming); Cultural (Worship, heritage, informal meeting place); Naturalists (bird watchers and other nature enthusiasts)

Table1: Services derived from Lake Pair 1

4.2.1.Nagavara Lake: This is another of the privatized lakes of the city, now converted into an amusement park that offers boating as well as other water sport based recreational facilities. There is only one entry point into the lake that is accessible to all users. All of the traditional entry points into this lake are either manned or padlocked and consequently many categories of lake users remain cut off from the resource. The lake connects with the village of

Mariyannapalaya on the eastern arc, the Outer Ring road to its West and the Kempapura Main Road to its South.

Land use around the lake is primarily commercial with numerous informal establishments dotting the landscape. These include sculptors, transport godowns and small shops. Formal establishments such as an IT park and a few engineering establishments are also found around this lake. The area occupied by the village consists of a semi rural landscape comprising primarily of low income households that do not connect directly with services provided by this lake.

Fishing licenses are provided by the Fisheries Department and these have been bought by a women's organization at Nagenahalli. Fishermen say that fish within the lake are of two kinds – those found naturally in the lake namely Maaruve and those introduced by the Department of Fisheries namely Julobi, Rohu, Catla and Moorgal. Some of these fish bring in as much as Rs 100 per kilogram while others are sold at the rate of Rs. 50-60 per kilogram. The fishermen on an average earn upto Rs. 200 a day while paying a royalty of Rs 5-6 per kilogram of fish sold. Fishing of this type is carried out using coracles.

A commercial park that charges an entry fee of Rs 20 exists on the western side of the lake. Christened Lumbini Gardens, this park makes use of the lake in order to create an attractive and aesthetically appealing environment for its visitors. Boating services and other water sports are also offered by this park. Shops existing around the lake are of two types – formal commercially organized settlements that are managed by the administrative body of the park and include some well-established franchisee networks, as well as informal small shops selling refreshments to the park visitors outside the lake premises.

4.2.2.Jakkur Lake: This is a public lake downstream of the Nagavara Lake and connects the villages of Jakkur, Sampigehalli and Kogilu as well as the relatively recent Arkavathy Layout. An aesthetically pleasing and well-maintained lake, it provides the local communities with many ecosystem services and benefits as detailed later.

A railway line and the Jakkur Road are in close proximity with the lake; however, land use around the lake is semi-rural, although gradually undergoing an urban transition with the presence of upcoming layouts and apartment complexes. At the time of the study, the landscape around the lake comprised primarily of associated wetlands and pasturelands interspersed with small villages and open areas of the upcoming layout. A sewage treatment plant is present at the northern arc of the lake.

A comparison reveals that the privatized Nagavara Lake has absolutely no remnants left of its cultural heritage. The two wells observed during the field visits were also remarkably dry. This stands in sharp contrast to the public Jakkur Lake, where the associated wells have a plentiful supply of water. The area surrounding the latter lake comprises of villages as well as the legally embroiled Arkavathy Layout. While the communities are gradually exhibiting a transition to urbanization from their inherently rural backdrops, the persistence of the village also ensures the survival of some of the cultural relics associated with the lake such as the sacred grove that have been marked on the map. However, a few cases of encroachment into the boundaries of Jakkur Lake were observed, mostly by apartments that have sprung up near the shores of the lake.

4.2.3 Resource Use around the lake

We also observed the various user groups who access and derive ecosystem services from the lake. Table 2 provides a comparative account of these user groups. As with the previous lake pair, it may be seen that the public lake supports greater diversity of traditional users as well as better provisioning and cultural ecosystem services. Indeed, of all the lake pairs we studied, this pair showed the greatest contrast. We also attempt provide a visual representation of this contrast through maps showing the land use around this pair of lakes in a later section.

Use category	Nagavara Lake (Private)	Jakkur Lake (Public)
Livelihood uses	Ground water extraction for maintenance of the lake, Organized commercial fishing, Commercial park, Informal commercial shops, collection of greens	Sewage Treatment Plant; Washing cattle and livestock; Dhobis; Organized commercial fishing; fodder collection; water hole for cattle and sheep; brick factory
Non livelihood uses	Domestic(groundwater extraction through both borewells and open wells); aesthetic living quarters for high income communities; Recreational (Water sports, theme park, walking, dating and alcohol consumption); naturalists	Domestic (bathing, washing, groundwater extraction through open and bore wells); Recreational (Angling, walking, jogging, swimming); Cultural (Worship, sacred grove; cemetery, heritage, informal meeting place, burial site for monkeys); Naturalists (bird watchers and other nature enthusiasts); Inspirational (Musicians)

Table 2: Services derived from Lake Pair 2

4.3.Pair 3: Vengaiahnakere and Kodigehalli Lake

4.3.1.Vengaiahnakere: This privately managed lake is part of the Koramangala Challaghatta Valley. Following privatization, a commercial park was constructed along its shores with provisions for a food court and other recreational facilities such as boating and a children’s play area. Entry into the lake is regulated by means of an entry fee of Rs.30 per adult, along with additional charges for carrying electronic equipment such as cameras.

The landscape adjacent to the lake comprises primarily of residential layouts, a prominent academic institution and a sewage treatment plant. Commercial enterprises were observed along the eastern arc of the lake, which is also connected to the busy KR Puram Main Road.

A commercial park exists within the boundaries of the lake that serves as an employment generator for various categories of individuals ranging from the maintenance to the managerial grade of employees. Numerous shops form part of the food court that exist within the park. These organized commercial establishments provide regular mealtime fare as well as fast eats and refreshments to its users. They are managed by the park’s administration. The lake offers commercial boating services around the lake, with this also serving as a means of earning

livelihood for its employees. In addition the presence of the lake forms an ideal location of the creation of high income layouts around it one of which is the Lake City Layout in its backyard.

Some cultural uses associated with the lake are those that were practiced by the village around the lake. These uses have currently become obsolete with the privatization of the lake. Tradition dictates that a village be associated with a lake, two open wells, lake deities, a temple, a sacred grove (gundu thoppu), a seat of justice (Ashwathkatte), a market and a cemetery. While many of these structures have ceased to exist around this lake, an ashwathkatte and a cemetery were noticed around the lake. A burial ground was also observed near this structure.

4.3.2. Kodigehalli Lake: This is a public lake downstream of Vengaiahnakere, and is situated in a relatively tranquil part of the city. There is no official demarcation of the lake boundary by any nodal agency. The lake is not connected to any of the busy roads of the city, and this low connectivity may also account for the few numbers of visitors it receives.

Primarily, agricultural fields and plantations occupy the area surrounding the lake. The northern part of the lake is fallow with two independent sewage channels feeding into the lake. A large slum rehabilitation project was under completion at the time of the study. A brick factory was also observed towards the northern arc of the lake. A few commercial enterprises were also noted.

It may be observed that the privatized Vengaiahnakere supports largely commercial livelihood uses and recreational non livelihood uses. Relics of cultural uses of the lake persist, however practices associated with these relics are no longer connected to the lake. On the other hand, Kodigehalli Lake, in keeping with the general trend observed during the course of this study, supports a greater diversity of traditional livelihood and non-livelihood uses.

These lakes once again show the presence of relics of erstwhile cultural importance attached to the privatized Vengaiahnakere, with the presence of a temple, Ashwathkatte and a burial ground close to the lake. The area surrounding the lake comprises largely of villagers with livestock and middle to high income residential layouts. On the other hand Kodigehalli lake, which is in the midst of a largely agricultural village that is currently undergoing urbanization, still has a lot of cultural significance attached to it. This can be evidenced by the presence of the lake deities on the eastern arc of the lake, as well as the presence of traditional channels and structures that divert water from the lake into neighboring fields.

In terms of user groups who derive benefits from the lakes, the results once again fit into the pattern observed in the previous two pairs with the private lakes being more commercialized, yet supporting a lesser diversity of ecosystem services. Table 3 is illustrative of this pattern.

Use category	Vengaiahnakere (Private)	Kodigehalli Lake (Public)
Livelihood uses	Organized commercial fishing, Commercial park, Informal commercial shops, Amusement rides; Boating	Groundwater extraction for agriculture; Fodder collection; Diversion of surface lake water for agriculture; Brick factory; Fishing
Non livelihood uses	Aesthetic living quarters for high income communities; Recreational(walking, dating and alcohol consumption);Cultural (relics of an ashwathkatte - ritualistic arrangement of three trees with religious significance); cemeteries	Domestic (bathing, washing, drinking, groundwater extraction through open and bore wells); Recreational (Angling, walking, jogging); Cultural (Worship, caste specific community based open wells); Aesthetic and environment (Social forestry)

Table 3: Ecosystem services derived from Lake Pair 3

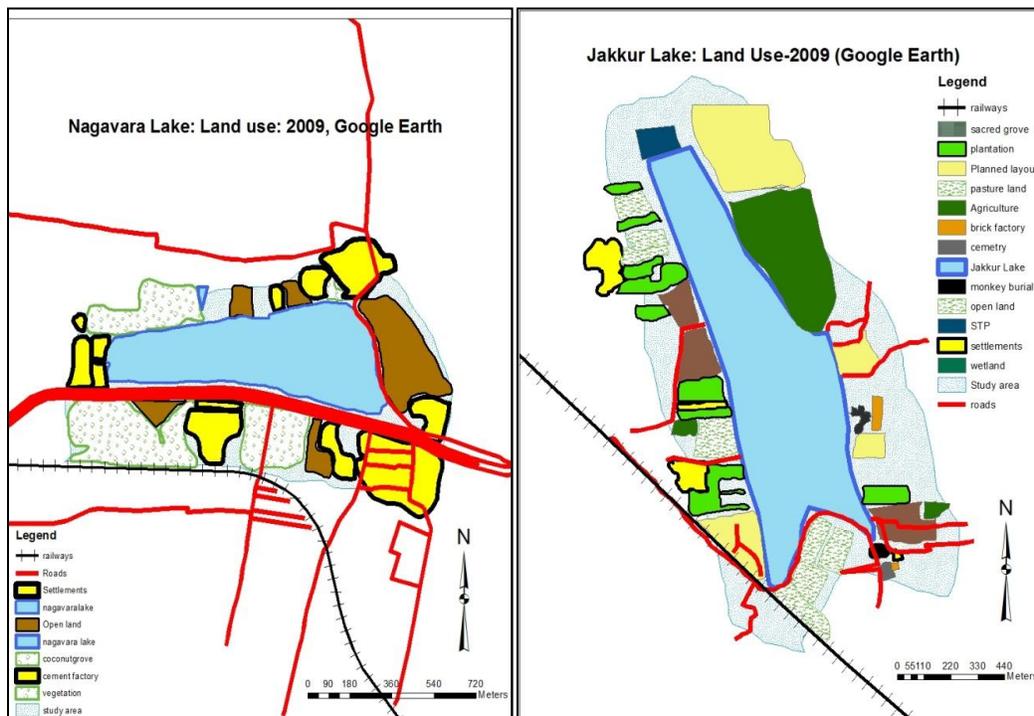
Further these results also show clearly that public lakes or operational commons support a greater diversity of uses especially those fitting within the traditional such as agriculture and ritual ceremonies as against the transformed privatized lakes. Public lakes also enjoy greater respect from communities they service – a fact evidenced by their saying that goes *‘Namma kereya neeru nimma hallige serutthade, nim kereya neeru namma hallige serutthade, aadare bere halliyavaru illige serbaaradu’*, that translates into “the waters from our lake reach your village, and the waters from your lake reach our village; however no other village should join us” – a reference to the different villages connected to the lake and their sense of belonging with the lake.

Table 4 brings in a comparative account of the nature of land use around the lakes. In general, these observations clearly show a remarkable tendency towards commercialization of the privatized landscapes inclusive of the area surrounding them. This further brings in new forms of marginalization and exclusion for those user groups who traditionally accessed the resource. While bringing in greater commercial returns by way of amusement parks and eateries the transformed commons exclude access to these traditional uses thereby reducing the inherent value of the lake system to these user groups. This reduction in user values translates into concerns about the sustainability of the lake ecosystem in the long run.

Categories	Privatized Lakes	Non privatized lakes
Nature of settlements	Middle to low income settlements at over 50m away from lake. High income houses closer (USP = a home by the lake), Benefits from lake indirect (example groundwater)	Low income homes closest to the lake with village like character. Few high rises overlooking the lake. Settlements much closer to the lake and derive direct benefits
Commercial establishments	Engineering/welding works, refreshment providers and fish markets	Not present within a radius of 100m
Sewage	Diverted away from the lake by parallel running channels	Sewage received from all settlements in addition to major sewage channels draining into it.

Table4: Land use around lake

Figures 2 and 3 attempt to illustrate this difference with one pair of lakes that were part of this study using visual representation in the form of maps namely Nagavara Lake and Jakkur Lake.



Figs 2 and 3: Land use around Lake Pair 2

5. Discussion:

Strong social networks and cultural identities are extremely important in maintaining a city's innate resilience to change, perhaps even more so than infrastructural advances (Campanella, 2006).

It has been said that a society's capability to withstand change lies in its actors, the strength of its social networks and its institutions (Lebel et al, 2006). We argue that in the context of the transformation of urban commons, there has been an alienation of both actors and social networks from the ecological landscape. This kind of alienation in theory can destroy the resilience inherent within that socio-ecological system.

The demands around a resource are of three kinds – the material, the imagined brought through the agency of culture and the symbolic that revolves around feelings evoked by the resource. The presence of these demands and their realization leads to the circulation of capital in the landscape. This circulation of capital creates possibilities for the improvement of infrastructure around the resource by the people who have access to it. Once the resource is 'tamed' or controlled, it begins to evoke an alternate cultural imaginary of circulation that emphasizes that resources are finite and there is a need to conserve them. It eventually leads to what has been called privately managed scarcity, which leaves access to the resource in the few hands deemed capable of accessing it (Oliver, 2006). The resource becomes revalued and re showcased as a scarce economic good that must be paid for in order to access its services (Smith and Ruiters, 2006). This commoditization of services also necessitates the identification of and the commercialization of single services as against the multiple ecosystem services derived from a non commercialized resource (Muradian and Rival, 2012).

In this paper, it has been shown that communities have been cut off from their traditional resource bases with the onset of private regimes and this has caused a social alienation from that resource. This study agrees with other similar studies in that it confirms the existence of relics that point to a consumptive use of a lake while showing that there is a transition of the resource into being purely recreational and unequally beneficial. For instance, a study conducted at Parappana Agrahara Village in Bangalore shows that people no longer consider the Parappana Agrahara Lake to be of any value to the community after its deterioration due to the inflow of raw sewage into the lake and after the government introduced community borewells into the village. This lake was formerly the source of drinking water for the entire village (Unnikrishnan 2011). Similarly, another study conducted at the "Rajapalayam Lake" (a pseudonym for a lake in Bangalore) concluded that the communities surrounding the lake have become alienated from the formerly important resource due to a combination of local neglect of the resource and bureaucratic mismanagement of the lake (Sundaresan, 2011).

Post privatizations of lakes within the city of Bangalore, certain changes have been noticed in the use and access of these lakes. Mainly it is the fact that due to the levy of an entrance fee, certain user groups became completely cut off from use of the resource and these not surprisingly were the most marginalized and traditional commons users such as dhobis and fodder collectors. Also, aesthetically and commercially appealing design elements were incorporated into the lake and its surroundings such as a commercial park, a children's play area and boating facilities. In most cases, an entire portion of the lake was cut off to all users of the lake. What is then seen on this landscape is a gradual cutting off from the benefits of using these resources especially of the

already marginalized people with little political influence, a phenomenon that resonates quite strongly with other developmental projects across the country.

In theory, the privatization of lakes in Bangalore seem to be undergoing a drastic discursive shift from being projected as a public good in surplus that was used abundantly in history into one where the discourse of scarcity took over transforming a public good into a commodity that could be accessed only by the capable. In a sense, both of these discourses have had its own social impacts on the affected communities. With the discourse of surplus, came policy changes such as historical edicts on the use of lakes (D'Souza and Nagendra, 2011) that led to the production of these water bodies as common spaces with multiple purposes. At the other end of the spectrum the discourse on scarcity (Kaika,2006) directed the path towards exclusionary policy measures such as privatization, which served to transform the erstwhile common spaces into commodities that had one specific purpose as against many, which was a feature of the surplus regime.

In the city of Bangalore, as well, the state's lack of clarity on the complex dynamics of socio ecological systems around lakes has caused an almost complete demise of traditional systems for the rural and low-income users around the privatized lakes. The resultant disruption has in its turn, paved way for new modes of marginalization of the already marginalized as well as a complete alienation from the resource that was once a part of the social ecological system. The PPP articulation with its rosy discursive arguments of decentralized service delivery and governance closer to people has in fact a tendency to depoliticize its services and discursively transform its citizens into customers (Smith and Ruiters, 2006). This transition in the perception of citizens around the resource has brought in newer paradigms of customer management and sustainable 'disuse' of the resource, which only intensifies the struggles for access around them. It is imperative that these issues be taken into account for inclusive and socially just policy measures aimed at governing common spaces in such a manner as to provide the maximum benefits of ecosystem services to all who can access the resource.

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References

- Ades, Alberto.F. and Edward.C.Glaeser, 1995. Trade and Circuses: Explaining Urban Giants. *Q.J.Econ.* 110, 95-227.
- Annaswamy, T.V., 2003. *Bangalore to Bengaluru : Urban History of Bangalore From the Pre-historic Period to the End of the 18th Century*, Vengadam Publications.
- B.L. Rice, 1905, *Epigraphica Carnatica Volume IX: Inscriptions in the Bangalore District*. Mysore Government Central Press, Bangalore.
- Berkes,F., Feeny .D., Mc Cay B.J. and Acheson. J.M., 1989. The Benefits of the Commons. *Nature.* 340.
- Campanella, T. J., 2006. Urban resilience and the recovery of New Orleans. *J.Am.Plann.Assoc.* 72(2), 141-146.
- Cumming .S. Graeme, 2011. *Spatial Resilience in Social Ecological Systems*. Springer Science and Business Media.
- D'Souza, Rohan and H. Nagendra, 2011. Changes in Public Commons as a Consequence of Urbanisation: The Agara Lake in Bangalore, India. *Environ Manage.*47 (5), 840-850.
- D'Souza, Rohan, 2006. *Research Study to Assess the Impact of Privatisation of Water Bodies in Bangalore*. Centre for Education and Documentation, Bangalore.
- Domberger.S., and Jensen.R., 1997. Contracting out by the Public Sector: Theory, Evidence, Prospects. *Oxf. Rev. Econ. Policy*, 13(4), 67-78.
- Elmqvist .T., Folke .C., Nystrom .M., Peterson G., Bengtsson .J., Walker .B. and Norberg .J., 2003. Response Diversity, Ecosystem Change and Resilience. *Fron Ecol Environ.* 1(9), 488-494.
- Fine Gael., 2010, *Reinventing Government: Protecting Services and Getting the Economy Back on Track* available at <http://www.rte.ie/news/2010/1107/finegael.pdf> accessed on 24 October 2012.
- Foster, Sheila R., 2006. The City as an Ecological Space: Social Capital and Urban Land Use. *Fordham Law School Occasional Papers*. Paper 5. http://lsr.nellco.org/fordham_oc/5, accessed on 24 October 2012.
- Foster, Sheila R., 2011. Collective Action and the Urban Commons. *The Notre Dame Review*, 87:1, 57- 134.
- Gowda, Krishna and M.V. Sridhara, 2007. Conservation of Tanks/Lakes in the Bangalore Metropolitan Area. *Management of Environmental Quality: An International Journal*, 18 (2), 137-51.

Heynen .N. and Robbins .P., 2005. The Neoliberalization of Nature: Governance, Privatization, Enclosure and Valuation. *Capitalism, Nature, Socialism*. 16 (1). DOI: <http://10.1080/1045575052000335339>

Heynen .N., and Perkins .H., 2005. Scalar Dialectics in Green: Urban private property and the Contradictions of the Neoliberalization of Nature. *Capitalism, Nature, Socialism*, 16(1), 99-113.

Heynen.N., Kaika .M. and Swyngedouw .E.,2006. Urban Political Ecology in Nik Heynen, Maria Kaika and Erik Swyngedouw eds, *In the Nature of Cities*, Routledge, Taylor and Francis Group

http://digitalcommons.library.umaine.edu/sms_facpub/52 accessed on 25 October 2012.

<http://infochangeindia.org/agenda/enclosure-of-the-commons/privatising-bangalore-s-lakes.html>, accessed on 14th September 2012.

<http://www.karunadu.gov.in/lda/lakes-list.html>, accessed on 8th September 2012

<http://www.rainwaterharvesting.org/bangalore/bangalore.htm>

Kaika .M., 2006. The Political Ecology of Water Scarcity: the 1989-1991 Athenian drought, in Nik Heynen, Maria Kaika and Erik Swyngedouw eds, *In the Nature of Cities*, Routledge, Taylor and Francis Group.

Lanjekar .P., 2009. Public- Private Partnerships and Urban Water Scarcity, Issues and prospects in Mumbai, India at http://r-cube.ritsumei.ac.jp/bitstream/10367/1099/1/12-RJAPS27_Public-Private%20Partnerships%20and%20Urban%20Water%20Security.pdf accessed on 25 October 2012.

Lebel, .L. Anderies, J. M. Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T. P., and Wilson .J., 2006. Governance and the Capacity to Manage Resilience in Regional Social-Ecological Systems. *Marine Sciences Faculty Scholarship*. Paper 52.

Mahapatra, M.D., Chanakya, H.N, and Ramachandra, T.V., 2011. Assessment of treatment capabilities of Varthur Lake, Bangalore, India. *Int. J. Environmental Technology and Management*, 14 (1/2/3/4), 84-102.

Mathur, A. and da Cunha, D., 2006, *Deccan Traverses: The Making of Bangalore's Terrain*, Rupa, New Delhi.

Milakovich, M. E.,1991. Total quality management in the public sector. *Natl. Prod. Rev.*, 10, 195–213. doi: 10.1002/npr.4040100208

Millenium Ecosystem Assessment Report; Leszek A. Bledzki PhD (Topic Editor) "Ecosystems and Human Well-being: Wetlands and Water (full report)". In: *Encyclopedia of*

Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth July 9, 2008; Last revised Date September 4, 2011; Retrieved October 25, 2012 [http://www.eoearth.org/article/Ecosystems_and_Human_Well-being:_Wetlands_and_Water_\(full_report\)](http://www.eoearth.org/article/Ecosystems_and_Human_Well-being:_Wetlands_and_Water_(full_report))]

Monbiot, G., 1994. The Tragedy of Enclosure. *Scientific American*, 27(January):159 and available at <http://www.monbiot.com/1994/01/01/the-tragedy-of-enclosure/> accessed on 25 October 2012

Muradian, R., and Rival, L., 2012. Between markets and hierarchies: The challenge of governing ecosystem services. *Ecosystem Services* 1, 93-100.

Narayanan, P. and Hanjagi, A., 2009. Land transformation: A threat on Bangalore's ecology - a challenge for sustainable development. *Theoretical and empirical researches in urban management*, 15, 38 – 47

Nicole Stelle Garnett, *Managing the Urban Commons*, Notre Dame Law School Legal Studies Research Paper No. 11-44, accessed from <http://ssrn.com/abstract=1972257> on 25 October 2012.

Oliver, S., 2006. The Desire to Metabolize Nature: Edward Loveden Lovedeon, William Vanderstegen, and the disciplining of the river Thames, in Nik Heynen, Maria Kaika and Erik Swyngedouw eds, *In the Nature of Cities*, Routledge, Taylor and Francis Group
Osborne, D., 1993. Reinventing Government. *Public Productivity and Management Review*. XVI (4), 349-356.

Ostrom, E. and Hess, C., 2007. Private and Common Property Rights from <http://ssrn.com/abstract=1304699> or at <http://dx.doi.org/10.2139/ssrn.1304699> accessed on 24 October 2012.

Public Interest Litigation (WP No. 817/2008), 2008, filed by Environment Support Group and Leo Saldanha against privatization of lakes in Bangalore available at <http://www.esgindia.org/projects/events/campaign-against-lake-privatisation-bang.html> accessed on 14 October 2012 and information also available at <http://www.cseindia.org/content/cases-protection-lakes-27> accessed on 25th October 2012.

Rice, B.L., 1897. *Mysore: a gazetteer compiled for government, revised edition, Volume 2*. Archibald Constable and Company, London.

Rowe, J., 2008. *The Parallel Economy of the Commons*. State of the World 25th Anniversary Edition.

Smith, L., and Ruiters, G., 2006. The Public Private conundrum of urban water: A view from South Africa, in Nik Heynen, Maria Kaika and Erik Swyngedouw eds, *In the Nature of Cities*, Routledge, Taylor and Francis Group.

Sudhira, H.S., Ramachandra, T.V., Subrahmanya, M.H.B., 2007. City profile Bangalore. *Cities* 24:379–390.

Sundaresan, J., 2011. Planning as Commoning: Transformation of a Bangalore Lake, *Review of Urban Affairs, Economic & Political Weekly*, XLVI (50).

TEEB Report 2011. *The Economics of Ecosystems and Biodiversity in National and International Policy Making*.

United Nations Center for Human Settlements, United Nations Environment Programme, the Ministry of Housing, Physical Planning and the Environment (Netherlands), the Ministry of Construction (People's Republic of China). 1996. "Managing Water Resources for Large Cities and Towns: Report of the Habitat II International Conference." Nairobi: United Nations Center for Human Settlements.

Unnikrishnan, H., 2011, Rural Urban Transition and Vulnerability to Climate Change: A Case Study of a Village in Bengaluru. Presented at the Second National Research Conference on Climate Change organized by the Center for Science and Environment, IIT Delhi and IIT Madras available at <http://www.indiaenvironmentportal.org.in/reports-documents/rural-urban-transition-and-vulnerability-climate-change-case-study-village> accessed on 25 October 2012.

