

**TITLE:** Evolution in nature of collective action around water-bodies in Bangalore

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### **Abstract**

The city of Bangalore in India has been struggling to prevent the destruction of its water-bodies. Over the last few decades, the city has witnessed sustained self-organized efforts to prevent the destruction of its numerous water-bodies. The nature of collective action has however changed over the years – what started off as a very state-led initiative in water-body rejuvenation has gradually transformed into a citizen led movement. The ideology of governance has also changed, as the nature of participants involved in the collective action process has changed. The objective of this paper is to map these changes. Using a series of intensive semi-structured interviews with stakeholders involved in the collection action around a sample of 8 water-bodies from Bangalore, I seek to understand how the nature of collective action has evolved and how the ideology of governance has also changed parallelly. I try to support the data collected through my interviews with data collected through archival and secondary research.

**KEYWORDS:** Social impacts and human dimensions of natural resource management; Governance ; Urban Collective Action; Social-ecological system; Water; Bangalore

## **Introduction**

The purpose of this paper is to theoretically explain how the nature of collective action, around water-bodies in Bangalore, has evolved over time. To do so, I draw on ideas developed by the Bloomington School, and other scholars, namely North, Folke and Fligstein.

## **Literature Review**

### Social-ecological system (SES)

For the purposes of this paper, I use the definition proposed by Anderies et al. 2004 ~ “a SES is an ecological system intricately linked with and affected by one or more social systems. An ecological system can loosely be defined as an interdependent system of organisms or biological units. Social systems can be thought of as interdependent systems of organisms. Thus, both social and ecological systems contain units that interact interdependently and each may contain interactive subsystems as well. We use the term “SES” to refer to the subset of social systems in which some of the “interdependent relationships among humans are mediated through interactions with biophysical and non-human biological units.” The behavior of SESs is adaptive in nature due to the presence of feedback loops in the system (Holling 2001). The analysis of SESs as integrated units is different from the analysis of social and ecological systems as separated systems. The ability of social institutions to adapt to the feedback loops in the ecological system leads to effective governance of the system (Folke et al. 2005).

### Institutions, social systems and ecological systems

Social and ecological systems are components of an “integrated” entity (Folke et al 2007; Folke et al 1998). The ecological system is dynamic and adaptive in nature – its constituent properties fluctuate over time; different ecological processes interact with each other resulting in cyclic, self-organizing behavior of limited predictability at the system level. Natural disturbances, which are an intrinsic part of the ecological system, further increase unpredictability. Institutions are “humanly defined constraints”. They link the social to the ecological system – “institutions ... are mechanisms people use to control their use of the environment and their behavior toward each other ... They link society to nature, and have the potential to coordinate the human and natural systems in a complementary way for both ecological and human long-term objectives” (Folke et al 1998). Many institutions developed by society, in use currently for ecological management practices, however do not take into the account the complex adaptive nature of ecosystems. This results in crisis at the social-ecological level which can trigger institutional learning if “agents break through dense or encrusted institutional structures to achieve useful innovations”. Such behavior by agents can lead to the design of institutions in social systems which fit the corresponding ecological system.

### Collective Action Scenarios

A collective action scenario arises when actors with common or conflicting interests cooperate to solve a problem of common interest. Decision making in such cases “relies on learning and adaptation”. Actors “learn norms, heuristics and full analytical strategies from one another, from feedback from the world and from ... self-reflection ... They are capable of designing new tools – including institutions – that can ... change the structures of the world they face” (Poteete, Janssen and Ostrom 2010; pp. 220-

221). Research shows that actors “systematically engage in collective action to provide” goods derived from SESs (Aligica and Boettke 2009; pp. 55).

### Mental models, ideologies and institutions

For the purposes of this paper, I define mental models and ideologies as proposed by Arthur and North (1994) – ideologies are “ideologies are the shared framework of mental models that groups of individuals possess that provide both an interpretation of the environment and a prescription as to how that environment should be structured”; mental models are “are the internal representations that individual cognitive systems create to interpret the environment”. In contrast to mental models which are “*internal* representations”, institutions, according to Arthur and North (1994) are the “external (to the mind) mechanisms (that) individuals create to structure and order the environment”.

An individual’s mental model develops gradually over time based on the individual’s experiences in life, his perceptions about his surroundings and the resulting “memory of analytic results and experiences”. His mental model gradually evolves over time via *learning* in the form of the feedbacks from his surroundings which may strengthen certain aspects of his mental model or lead to the modification of other aspects. Every individual’s mental model is unique because every individual’s life experiences are unique as every individual’s experiences are shaped by the unique “local physical environment and the socio-cultural linguistic environment” that each individual is exposed to. An individual’s mental model is also influenced by the ideologies of the various groups to which he belongs (Arthur and North 1994).

A shared mental model or an ideology provides a common set of belief systems and experiences in which to interpret the environment. It also provides a common language for its adherents to communicate with each other. Thus over time, the mental models of individuals who share a common ideology may gradually converge over time. In a similar manner, an ideology develops as individuals communicate with each other. Aspects of mental models which are similar among communicating individuals are what constitute the “the shared framework of mental models” which make up an ideology (Arthur and North 1994).

In general, an individual’s mental model or the ideology shared by a group of individuals remains stable over long stretches of time. They evolve *incrementally* as learning leads to changes in some aspects of the mental models. However, differences in belief systems for interpreting the environment and differences in languages for communication may often bring groups, with different ideologies, in conflict with each other. During such times, ideologies or mental models may be characterized by “relatively short periods of dramatic changes” (Arthur and North 1994).

Individual or group decision-making in situations characterized by uncertainty and complexity is influenced by ideology. Institutions are the external manifestations of mental models shared by a like-minded group of individuals. They are influenced as much by individual mental models as by ideologies shared by a group of individuals. Therefore as communication leads to a change in ideologies, institutions too change “in a co-evolutionary process” (Arthur and North 1994).

## Strategic Action Fields (SAFs)

In 2011, Fligstein and McAdam proposed a general theory of strategic action fields to explain collective strategic action – i.e. in order to explain how social order and social change result from the strategic behavior demonstrated by collective actors as they interact with other actors. In other words, SAFs are the “fundamental units of collective action in society”. Society consists of multiple SAFs with each SAF representing a potential site for the depiction of a collection action scenario. SAFs provide “a view of social life as dominated by a complex web of strategic action fields”.

The theory of strategic action seeks to explain decision making by actors in collective action scenarios as choice-making (trade-off) behavior. According to Jasper (2004), the ability to choose is the ability to “initiate or pursue one flow of action rather than another, respond in one way to events rather than in others”. In addition to actors also “take into account what others are doing” (Fligstein 2013). Jasper (2004) proposes that while institutions, cultural variables and environmental structures influence how actors perceive the options available to them, outcomes cannot be explained “without looking at the choices made, the interactions, and the results”. He asserts that the model of strategic action is different from rational choice models, by emphasizing that actor “intentions, understandings and actions” cannot be studied independently of cultural, psychological and institutional contexts. . Thus, the model of strategic action seeks to explain “one of the most important moments, and source of creativity ... when strategic players manage to break with expectations and make another choice, taking their opponents by surprise.” Cultural variables (meanings), institutional variables, societal traditions and actor emotions, values & moral sentiments and the psychological make-up of an actor constrain the options (which could vary from actor to actor) that an actor can choose from during the process of decision making.

A SAF is a “socially constructed” arena “within which actors with varying resource endowments vie for advantage” (Fligstein and McAdam 2011). The boundaries of a SAF are fluid in nature, and vary as actors interests within the field change or as actors enter or leave the field. The principal characteristic of a SAF is that a “consensus” or a shared “understanding” exists within the field about the “rules” within the field.

According to Fligstein and McAdam (2011), SAFs are emergent in nature – i.e. SAFs arise or are created dynamically within society due to interactions between “proximate” or “distant” SAFs as conditions change within society. Thus, society is characterized by a continuous situation of “turbulence” because of continuous interactions between interdependent SAFs, resulting in continuous adjustments between SAFs and within SAFs. These adjustments are conceived as different forms of organizational learning. Fligstein and McAdam (2011) use the analogy of ripples to explain turbulence in society – “like a stone thrown in a still pond, sending ripples outward to all proximate fields”.

Similarly, order within a SAF too is in a state of continuous “flux”. The “process of contention” within a SAF is “ongoing” – the rules of a SAF keep changing, the position of actors within a SAF keep varying and the overall goals of a SAF too are subject to fluctuations. Distinct forms of governance exist with each SAF. SAFs may also be subject to “external” governance systems which might exist within society. A SAF may be subject to a “crisis” arising out of “an exogenous shock emanating from a proximate field”. A crisis arises when the SAF is unable to deliver the required goods expected by existing actors within a SAF (Fligstein 2013). A “genuine transformation” may occur with a SAF after

being affected by a crisis. A transformation is conceived of as a “restructuring of relationships” with the SAF (Fligstein and McAdam 2011). Relationships within a SAF can be “competitive, coercive, or cooperative” (Fligstein 2013).

### Action Situation

The action arena in the IAD framework is analogous to strategic action fields. An action arena consists of the action situation and the participants. Participants interact within the action situation and produce outcomes. During such interactions, participants are also affected by exogenous variables. The outcomes of an action arena can in turn affect other action arenas (Ostrom 2005, pp.13; McGinnis 2011).

### Adaptive Governance

Aligica and Boettke (2009; pp. 56-58) observe that, according to Vincent Ostrom, the human ability to exercise choice is the “source of social order and social change” as the exercise of choice is the basis of adaptive human behavior. The process which generates adaptive human behavior is learning. The emergence of institutions of governance through this process of learning is the result of adaptive human behavior. Thus, “an account of human society” is an account of learning “manifested through choice”.

Folke et al. (2005) observe that change (disturbance) in a SES can be turbulent due to the presence of feedback loops. Effective governance of such changes therefore requires the development of institutions which can develop or maintain the capacity of the system to absorb such changes such that the system retains “essentially the same function, structure, identity, and feedbacks”. Therefore, according to Folke et al. (2005) effective adaptive governance is creating conditions for “ordered rule”, for “collective action” and for emergence of “institutions of social coordination” such that the decision-making process within the system can resolve the emergent trade-offs by managing and monitoring the feedback processes within the system.

The adaptive nature of SESs leads to uncertainty about effective governance of such systems. Therefore to effectively deal with such uncertainty, decision-makers need to develop the ability to “deal flexibly with new situations”. This requires that “processes of sense-making” become ingrained in the processes of decision-making prevalent in the system. Sense making is the process of “taking interpretations seriously, inventing and reinventing a meaningful order and then acting upon it”. In other words, processes of “social learning” or “institutional learning” are integral components of effective adaptive governance (Folke et al. 2005).

Effective adaptive governance also requires that “a diverse set of stakeholders, operating at different levels” work together to “resolve issues concerning dynamic ecosystems” through “polycentric institutional arrangements” (Folke et al. 2005).

### Polycentric governance

Polycentric governance connotes “a complex combination of multiple levels and diverse types” of actors “drawn from the public, private, and voluntary sectors” in competitive, contractual or cooperative relationships with or without “recourse to central mechanisms to resolve conflict” (Ostrom et al. 1961; McGinnis and Ostrom 2011). The interests of these actors may vary considerably. These differences in

interests lead to different levels of cooperation at different levels. Such arrangements may not necessarily be efficient and therefore the focus shifts from efficiency to effectiveness of governance. Thus, while the apparently fragmented nature of a polycentric governance system may be deemed as chaotic, “a pattern of order” exists “underneath the apparent chaos” (Aligica and Boettke 2009; pp. 20, 42, 44, 50).

The order within a polycentric system is “spontaneous” in nature arising out of “mutual adjustments” between various “elements” which make up the system. This form of spontaneous order prevalent within polycentric systems is however governed by an “encompassing system of rules” which emerges spontaneously from within the polycentric system. Therefore, polycentric modes of governance can lead to “self-organized, self-corrective institutional change” (Ostrom 1998 in Aligica and Boettke 2009; pp. 22, 23).

The concept of polycentric governance is applicable to a “large range of social phenomenon”. The “functions and the institutional arenas of society” can be “organized” under polycentric forms of governance. Thus, the “entire social system” can be conceptualized as being “shaped by underlying currents originating in pulsating polycentric domains ... creating a tension towards change”. (Aligica and Boettke 2009; pp. 21, 25, 26).

Good governance does not arise automatically out of polycentric systems. Order within the polycentric system depends on the initiative of actors who are part of the system. (Aligica and Boettke 2009; pp. 23, 24, 28). The “exercise of initiative” by actors and the processes of “discussions and negotiation” lead to “innovations” in governance practices. (Aligica and Boettke 2009; pp. 46-49; Oakerson and Parks 1998 in Aligica and Boettke 2009).

### **Proposed framework for analysis: Connecting the dots**

I visualize a SES (social-ecological system) as a web of multi-level, multi-scale strategic action fields (SAFs). Each strategic action field represents a collective action scenario. SAFs can be at different levels – at the resource system level, at the community level, at the city level etc. SAFs arise or are created dynamically within a SES due to interactions between SAFs. A SES is characterized by a continuous situation of “turbulence” because of continuous interactions between interdependent SAFs. Such interactions result in continuous adjustments between SAFs and within SAFs. These adjustments are conceived as different forms of learning.

SAFs are also characterized by turbulence internally. In each strategic action field, diverse actors (groups of individuals and organizations) interact with each other to solve a problem of common interest. Relationships within a SAF can be competitive, coercive, or cooperative. During such interactions, actors are also affected by exogenous variables. Actors interact with each other and produce outcomes. The outcomes in a SAF can in turn affect other SAFs.

Within a SAF, decision-making is characterized by uncertainty and complexity. Decision making within a SAF therefore relies on learning and adaptation and is therefore influenced by the ideologies shared by different actors who constitute the SAF. Institutions are the external manifestations of mental models shared by a like-minded group of actors. They are influenced as much by individual mental

models as by ideologies shared by a group of individuals. As ideologies change, institutions too change “in a co-evolutionary process”.

Institutions link social systems to ecological systems. Learning can lead to a change in institutions. Learning takes place in a SES due to the presence of feedback loops in the system. The ability of social institutions to adapt to the feedback loops in the ecological system leads to effective governance of the system.

Change (disturbance) in a SES can be turbulent due to the presence of feedback loops. Effective governance of such changes therefore requires the development of institutions which can develop or maintain the capacity of the system to absorb such changes. Effective adaptive governance is creating conditions for ordered rule, for collective action and for emergence of institutions of social coordination such that the decision-making process within the system can resolve the emergent trade-offs by managing and monitoring the feedback processes within the system. Processes of “social learning” or “institutional learning” are integral components of effective adaptive governance. The exercise of initiative by actors leads to learning, and therefore to effective governance of a social-ecological system.

### **Empirical background**

According to various media reports, there were about 200 to 300 water-bodies in the city of Bangalore during the middle of the 21st of century. With urbanization, most of these water-bodies were filled up. It now appears that only about 33 water-bodies currently survive. Alarmed by this rapid encroachment and disappearance of water-bodies, the government of the state of Karnataka 1 (Bangalore is the capital city of this state) set up a Committee in 1986 to look specifically into the preservation and restoration of lakes. The findings of this committee came to be known as the Lakshman Rao Committee Report. The government of Karnataka confirmed its intent to conserve lakes of Bangalore by accepting the findings of the Lakshman Rao Committee Report. However, in subsequent years the conditions of the water-bodies continued to worsen. Therefore, in 1995 a public interest litigation (PIL) was filed at the High Court of the state of Karnataka with the intention of enforcing the recommendations of the Lakshman Rao Committee report. In response, The State High Court issued interim directions in this PIL, calling upon state agencies to protect the water-bodies. Therefore, the state Legislature constituted a “Joint Legislature Committee on Encroachments in Bangalore Urban District” which called for the setting up of a Lake Development Authority (LDA) to ensure comprehensive rehabilitation of lakes of all municipalities in Karnataka. Starting in the year 2005, LDA sought to do this by almost entirely privatizing<sup>2</sup> the development, management and control of lakes. LDA initially signed 4 agreements handing over to various commercial entities in Bangalore the following 4 water-bodies - Hebbal lake, Nagawara lake, Vengaiahnakere and Agara lake. The privatization<sup>2</sup> initiative was widely criticized and campaigned against by hundreds of individuals and organisations. After a period of time, the State High Court ruled against the privatization of lakes and these lakes were handed back to the LDA. However, LDA is not the

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<sup>1</sup> India has a federal structure with powers divided between the government at the center and various states. Karnataka is one such state.

<sup>2</sup> I am currently not getting into the semantics of what was meant by privatization - with regard to the bundle of associated property rights.

only public agency responsible for the upkeep of lakes in Bangalore. Two other agencies (among others), BDA (Bangalore Development Authority) and BBMP (Bruhat Bengaluru Mahanagara Palike) are also in-charge of a number of other lakes in the city. Starting in 2011-12, BDA, BBMP and LDA initiated procedures for joint management of lakes in the city with various citizen groups and non-profit organizations. Today, a number of lakes in the city are governed by such procedures. Various kinds of entities are involved in the action around these water-bodies – citizen groups, non-profit organizations, for-profit organizations, public agencies, the judiciary and political parties.

For the purposes of this study, the primary selection criterion was that all selected water-bodies should have citizen groups involved in the collective action around the water-body. I included only mid-sized and small-sized water-bodies (based on a relative ranking of water-bodies in the city) but ensured that I selected water-bodies in which the above mentioned public agencies were stakeholders. I used a simple outcome variable: Condition of water-body (not-restored/ being-restored/restored) as the final selection criterion.

Name of water-body	Size	Size in acres	Agency	Outcome
L-waterbody	Mid-sized	60	LDA	Not-restored
K-waterbody	Mid-sized	48	BBMP	Restored
V-waterbody	Mid-sized	40	BDA	Not-restored
A-waterbody	Mid-sized	38	BDA	Not-restored
M-waterbody	Small-sized	11	BDA	Being-restored
P-water-body	Small-sized	13	BBMP	Being-restored
H-waterbody	Small-sized	16	BBMP	Being-restored
C-waterbody	Small-sized	11	BBMP	Restored

The data collection process is ongoing – so what I present below are my hypothesis based on the preliminary observations.

### **Discussion: Explaining the situation on the ground**

In order to theorize about the gradual evolution of collective action around water-bodies in Bangalore, I visualize the network of water-bodies in the city of Bangalore as a social-ecological system. There are a number of strategic action fields (SAFs) in this SES – at various levels - for instance, there is a SAF around each water-body in the city; there is a city-level SAF, and so on and so forth. There are overlaps in the nature of actors involved in the various SAFs – for instance some representative of public agencies are involved in some water-body level SAFs and also at the city-level SAF; however, some actors are limited in their involvement with only certain SAFs – for instance, some non-profits are involved in collective action at the city level but are not so involved at the water-body level. Because of overlaps in memberships of various SAFs, there is continuous interaction between interdependent SAFs. This leads to communication between SAFs and learning in the form of feedback loops. SAFs also witness turbulence internally – some actors (non-profits) are motivated primarily by the altruistic goal of protecting the concerned water-body; other actors (politicians) may be more motivated by the need to seek re-election or more ulterior motives which may not be in the larger interest of the water-body. Actors come and go – some change jobs and leave the city; new members come in. Civil society activists can be classified into a number of schools based on their *ideologies or shared mental-models*– those who believe

that it is the sole responsibility of ‘the government’ to take care of lakes; those who seek a ‘co-governance arrangement’ – i.e. both ‘government’ and civil society and non-profits should be involved in lake governance but those who are strictly against the involvement of any kind of for-profit entities; those who seek a more active involvement of civil society and non-profits in water-body governance; those who are not against involvement of for-profit organizations but are against commercialization of lake premises; so on and so forth. The nature of solutions being proposed by public agencies has also changed – in the past, public agencies saw themselves as the sole ‘governers’ of water-bodies in the city; this was followed by a phase where agencies began to actively seek out public-private partnerships for lake governance; today, we see the same agencies actively looking at ways to hand-over a part of the lake governance responsibilities to citizen-groups and non-profits. Opposing ideologies come into conflict with each other. Over time, some ideologies gain predominance over others. One of the reasons why public agencies began looking for active involvement of private players and later for active involvement of citizen groups was the gradual realization that they were limited in their ability to actively govern the city’s water-bodies. This realization can be viewed as a form of social learning based on feedback received in the form of deteriorating water-body conditions in the city. Thus, in order to adapt to the changing conditions, public agencies formulated a new mental-model for governance. This change in mental model resulted in a change in the nature of institutions being considered for water-body governance in the city.

## **Conclusion**

This is a work in progress. I am currently mid-way through the data collection process. Some of the proposed ideas may change as I develop a firmer grasp of the ground realities.

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