

# MAIEUTIC RESEARCH AND EDUCATION IN DISTRESSED SOCIAL-ECOLOGICAL SYSTEMS. LESSONS FROM THE STATE NAMED AFTER *THE GREAT RIVER*, MISSISSIPPI, USA

*INVESTIGAÇÃO MAIÊUTICA E EDUCAÇÃO SOBRE SISTEMAS SOCIO-  
ECOLÓGICOS ENFRAQUECIDOS. LIÇÃO A PARTIR DO ESTADO RIO GRANDE, O  
PAI DA ÁGUA, MISSISSIPPI, USA*

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## ABSTRACT

Rivers and their ecosystems are vital cores of human societies: not only do they provide resources, in particular for rural economies; they also generate symbolic meanings in different cultures around the world. Although water is an essential necessity for life, communities are not always able to have harmonious relationships with it. Flooding, pollution, landscape degradation, and resource crises are common topics in the media and political agenda. These are not just technical issues. In environmental management, the crucial point is to integrate and organize community members (laymen, ecologists, researchers, administrators, etc.) toward a common goal of self-sustainable life quality enhancement. Moreover, within the field of environmental and social sciences, especially in the framework of Social-Ecological System (Gunderson et al., 1995; Holling, 2001; Ostrom 2009) three assumptions have been widely recognized. First, the health of natural resources is connected with the health of societal dynamics. Second, societal dynamics are complex and they may be expressed in forms of conflicts or collaborative efforts. Third, the role of education, in its various forms, may be crucial in facing various social-ecological issues, improving societal dynamics. The question is: what type of education is needed when communities undergo critical phases? This paper presents results from an empirical planning research that has been conducted in order to unravel dynamics of a distressed and paradigmatic social-ecological system, specifically the State named after the Mississippi River, the *Great River* in Native American language. The State of Mississippi is located in the Deep South of USA and one of the most complex river systems in the world. Findings are twofold. On one side, key methodological lessons are discussed, in order to allow the definition of a Maieutic approach to planning research. On the other side, results provide a typology for environmental educational approaches, as they have been detected, experienced and described by the interviewees, in order to allow the definition of a more complex Maieutic approach to education.

**Keywords:** Water; Common Pool Resources; *Phronetic* Research; Participatory Action Research; Environmental Education.

## RESUMO

Os Rios são ecossistemas indispensáveis e fundamentais para a sociedade humana: quer para fornecer recursos, em particular nas economias rurais; quer como geradores de significados simbólicos nas diferentes culturas em todo o mundo. Apesar da elevada quantidade de água ser

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uma necessidade essencial para a vida, as comunidades nem sempre são capazes de ter uma relação harmoniosa com a mesma. As inundações, a poluição, a degradação paisagística e a crise de recursos são temas comuns nos meios de comunicação e nas agendas políticas, não sendo somente uma questão técnica. Em matéria de gestão ambiental, o ponto crucial é a capacidade de integrar e organizar os membros da comunidade (pessoas não especializadas, ecologistas, investigadores, administradores, etc.) no sentido de um objetivo comum e autosustentável de melhoria da qualidade de vida. Além disso, dentro do campo das ciências ambientais e sociais, especialmente no âmbito dos sistemas ecológico-sociais (Gunderson et al., 1995; Holling, 2001; Ostrom 2009), três hipóteses têm sido amplamente reconhecidas. Em primeiro lugar, os recursos naturais estão ligados a dinâmicas sociais. Em segundo, as próprias dinâmicas sociais são complexas e podem ser expressas sob a forma de conflito ou esforço colaborativo. Em terceiro, o papel da educação, nas suas diversas formas, pode ser crucial para enfrentar diversas questões sociais e ecológicas. A questão que se coloca é a seguinte: Qual o tipo de educação ideal quando as comunidades atravessam uma fase crítica? Apresenta-se, então, os resultados de uma pesquisa empírica sobre planejamento, realizada para revelar as dinâmicas de um angustiado e paradigmático caso socio-ecológico, mais especificamente sobre um estado, localizado no sul dos Estados Unidos, cujo nome é o do próprio rio que o atravessa, o Rio Mississippi, considerado como *grande rio pai da água* (na língua nativa americana) e um dos mais complexos sistemas fluviais do mundo. As conclusões são de dois tipos: as metodologias são discutidas com o fim de encontrar uma definição de Investigação Maiêutica e os resultados fornecem uma tipologia de abordagens educativas ambientais ao fim de encontrar uma definição de Educação Maiêutica.

**Palavras-chaves:** Água; Bens Comuns; Investigação *Phronetica*; Investigação-Ação Participativa; Educativas Ambientais.

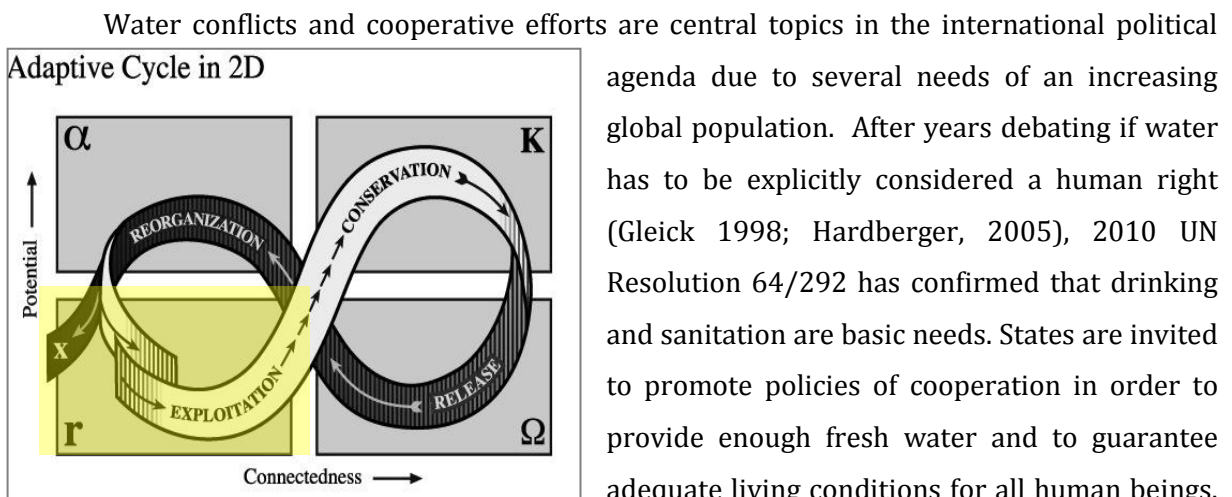
## 1. INTRODUCTION

Within the field of regional and urban planning, human geography, sociology, ecology and related branches of knowledge, environmental education is considered a crucial element in the process of regenerating distressed environments (Stapp, 1969; Sauv , L. 2005; Berkes and Turner, 2006; Pahl-Wostl, 2006). In the broader discussion about educational approaches, there exists a specific school of thought based on the so-called Socratic method, i.e. Maieutic. As Plato reports in *Teeteto* (reported in Reale, 2000), the Greek philosopher Socrates describes Maieutic recalling his mother that, being a midwife, had the commitment of supporting the act of giving birth. Metaphorically, Maieutic is the ability of activating critical thinking, rather than transferring notions. According with the Socratic dialectical method, asking questions is a means aimed at lighting up a possible way for gaining knowledge, rather than imposing preconceived, yet partial, forms of knowledge. This approach has been widely discussed and reframed by a wide range of eminent thinkers, and their followers, such as Dewey (1916), Gandhi (1933, in Kumarappa, 1953), Freire (1974), Dolci (1996). Their lessons have been validated especially when learners are distressed human communities aimed at embracing a process of empowerment (Reardon, 1998). Distressed human communities have an impact and relation with distressed natural environments, in the sense that the physical/biological/social systems are strictly intertwined. This nexus can be better explained by the following postulate: the health of natural resources reflects the health of human relations. As a matter of fact, human relations

constitute the base of those organizational structures aimed at governing, managing and taking care of the environment. In other words, the natural environment is like a *litmus paper* for understanding the quality of societal dynamics. This postulate has been widely discussed within two connected streams of literature: the debate about Common Pool Resources (CPRs), i.e. the basket of goods that are governed through complex public-private partnerships (Ostrom 1990); the debate about Social-Ecological Systems (Gunderson et al., 1995; Holling, 2001; Ostrom 2009), i.e. the organizational structures (institutions), that allow the management of CPRs through the interaction amongst different actors within ecosystems. Narrowing the scenario to a river's ecosystem, it is possible to observe more insightfully the aforementioned mechanism, due to the critical challenges of interactions amongst various actors within fluvial/rural/urban environments alongside a watercourse. This paper presents results from an empirical planning research that has been conducted in order to explore, to narrate and to tackle dynamics of a distressed Social-Ecological System, where the "human/human" and "human/natural" nexuses are characterized by a status of exploitation. The aim is providing lessons that may be useful in other contexts with similar characteristics, although this is not an attempt of finding a universal lesson. Specifically, after examining the collaborative/conflicting cases that may occur in a SES, the focus is to understand what educational approaches may be feasible in order to overcome the exploitation phase, toward a more resilient and adaptive SES, through a process of transformation. Research has been developed integrating a variety of approaches based on a deep interaction between researchers and key-actors. This methodology has led to define a Maieutic approach to planning research, that has been designed and implemented with the purpose of triggering critical thinking in distressed contexts, having the opportunity of exchanging/shaping knowledge with key-actors during the process of conducting the research project itself. Findings are two-folded. On one side, key methodological lessons for planning research are discussed. On the other side, results provide a typology of the detected environmental educational approaches, as they have been experienced and described by the interviewees, in order to allow the definition of a more complex Maieutic approach to education, in a specific SES, aimed at tackling challenges holistically. In this case, the distressed SES is the State named after the Mississippi River, the *Great River* in Native American language, located in the Deep South of USA and one of the most complex river systems in the world. The state named after the *Great River* has been studied as a paradigmatic case for its extreme characteristics referring to the "human/human" and "human/nature" interaction in a phase of exploitation of both natural/human resources. According to FAO, this state belongs to the group of areas that are plentiful of water comparing to other areas in the world; historical environmental issues have been flooding, drainage and rivers' impairment (Barry, 1997). Despite water's abundance, cycles of drought and aquifer's depletion are nowadays threatening rural areas due to overuse

(Coupe et al., 2012). According to U.S. Census Bureau, Mississippi is also the poorest state of one of the richest nations in the world. At once it hosts profitable agribusiness operations that benefit from the rich soil which the river itself created (Harrison, 1961), together with heirs of former African American slaves and sharecroppers, who are currently on average marginalized citizens (Cottrell, 2011). The latter have been historically excluded from the democratic debate (Cobb, 1992), and subsequently from the decision-making process about water. The State of Mississippi is presented as a practical example in order to develop a Maieutic approach to planning research, as well as to identify a Maieutic approach to education, for allowing the whole distressed SES to be regenerated, in its environmental, socio-economic and institutional dimensions. The paper is structured as follows. Paragraph 2 recalls the theoretical debate that has been adopted in order to frame the issues and to define research questions; paragraph 3 declares assumptions, epistemological and methodological characteristics of the proposed research approach; paragraph 4 presents results that have been organized in a *Mississippi Tale*, using a narrative form in order to be consistent with the epistemological choices. Conclusions are divided in paragraph 5.1, which provides lessons regarding Maieutic approaches to education in the analyzed context characterized by specific socio-ecological challenges, and paragraph 5.2, which highlights methodological lessons for planning researchers, defining a Maieutic approach to research; finally, key findings aimed at inspiring regenerative processes for distressed SESs are summarized.

## 2. WATERSHED PLANNING IN DISTRESSED SES: CULTURAL FRAMEWORK AND STREAMS OF LITERATURE



**Picture 1.** The Adaptive Cycle (original picture: Gunderson and Holling 2001, p. 34). The author has highlighted the Exploitative Phase; it is the phase where distressed social-ecological systems, such as the State of Mississippi, are trapped.

general lack of the essential infrastructures such as wells and aqueducts. More generally the resolution invites citizens to be aware of decision-making processes about water, and local communities are called to embrace collective responsibility. Despite the debate about effective watershed management is still open in terms of public, private and community approaches (Langford, 2005; Bakker, 2007; Distasio and Ciervo, 2011), it is recognized that equitable distribution of water requires efforts of cooperation (UNESCO, 2013). These efforts regard all members of a civil society, including governmental agencies, NGOs, the whole academia, schools, and so forth. Water is not an isolated fluid. Fresh water circulates through hydrogeological configuration creating streams, rivers, aquifers, lakes, wetlands, etc. and their living habitats. Their ecological challenges are usually manifested in terms of groundwater depletion, rivers transformation, flood and pollution. Water/river issues have been studied through various theoretical frameworks, such as the so-called "Common-Pool Resources" and "Social-Ecological Systems", as the following paragraph describes.

## **2.1 The need for collaboration in SESs**

Ostrom (1990) examines Common-Pool Resources (CPRs), such as aquifers, and possibilities for overcoming the conflicts/paralysis expressed by the Tragedy of the Commons (Hardin, 1968), the Prisoner's Dilemma (Merrill Flood and Melvin Dresher, 1950, in Ostrom, 1990), and the Logic of Collective Inaction (Olson, 1965, in Ostrom, 1990). The Nobel Prize Recipient (in Economic Scienc, awarded in 2009) identifies empirical principles for reforming institutions with a bottom-up approach, including collective-choice arrangements and conflict-resolution mechanisms. She also argues that there are no "sure cures", but lessons that derive from practical examples; various cases show the importance of self-governance, i.e. a polycentric system of institutional bodies with a collaborative interaction amongst central governments, local governments, nongovernmental and community-based organizations (Ostrom, 2010, p.322). CPRs may be considered a specific part of complex Social-Ecological Systems (Ostrom, 2007) such as rivers. Literature shows how Social-Ecological Systems (SESs) benefits from adaptive governance, i.e. processes of continuous reorganizations with networks of actors able to overcome phases of crisis, retaining resilience and building up renewed institutions (Bateson, 1972; Gunderson et al., 1995; Holling, 2001). The concept of resilience has been introduced in ecological studies in the 70s (Holling, 1973), and it is currently at the center of the debate regarding sustainable management of resources. In a nutshell, resilience is "the amount of disturbance a system can take before its controls shift to another set of variables and relationships that dominate another stability region", (Holling in Folke 2006, p.254). Resilience is a specific property of SESs together with adaptability and transformability; adaptability is "the

collective capacity of human actors in the system to manage resilience”, while transformability is “the capacity to create a fundamentally new system when ecological, economic, or social (including political) conditions make the existing system untenable” (Walker, 2004). These attributes describe SESs together with the Adaptive Cycle, i.e. a flow of events that have been observed in self-organized systems characterized by high levels of adaptation. Although not all SESs are the same, the Adaptive Cycle helps framing the necessary mechanisms for gaining resilience, but in some cases transformations may be needed. The cycle is characterized by four ecological functions: r-periods of growth, exploitation and exponential change; K-periods of accumulation, conservation and rigidity;  $\Omega$ -periods of restructuring, readjustment and collapse;  $\alpha$ -periods of reorganization and renewal (Gunderson and Holling 2001; see picture 1). During these phases, conflicts and collaborative efforts may occur.

## **2.2. Conflict as a means to revealing unbalanced relations of power**

The tension between conflict and collaboration is one of the fundamental dilemmas about human nature; planners have dedicated various theories that take into account dynamics of power and consensus building in collaborative approaches to policy making, especially in contexts with lacking conditions for deliberative democracy (Campbell and Fainstein, 1996; Mandelbaum et al., 1996). As a matter of fact, conflict and collaboration have been extensively debated in planning theories as antithetic approaches. Collaboration and consensus building have been questioned through the argument of unbalanced relations of power that may generate dynamics of conflict amongst stakeholders. Flyvbjerg (1998; 2001) traces the philosophical discourses that are behind this debate referring to Habermas and Foucault. With the “theory of communicative action”, Habermas seeks for consensus building. Foucault focuses on conflict, considering relations of power as inescapable conditions for societies. Furthermore, in a provocative essay about mainstream planning theories, Yftachel (2006) warns about the risk of the ‘communicative turn’ of scholars, highlighting some limits of collaborative planning in contexts where marginalized ethnicities cannot express their needs for peculiar spatial issues. Also, in U.S.A. since the 80s several underprivileged communities started a struggle against discrimination in the allocation of industrial hazards, based on the principle that every citizen needs a healthy environment. Inspired by the Civil Rights Movement, this grassroots effort led to the creation of the Environmental Justice (EJ) Movement (Cole and Foster, 2001; Rechtschaffen and Gauna, 2002). There is assonance between EJ claims, and the echoes of debates about deep ecology as intended by Lovelock (1979). The first EJ principle affirms the “sacredness of Mother Earth, ecological unity and the interdependence of all species, and right to be free from ecological destruction”. EJ is not disjointed by the general reflections about sustainability.

Agyeman (2013) underlines the relation between sustainable societies and just societies, between environmental quality and human equality. He argues that there is no meaningful sustainability with a huge gap between levels of wealth and levels of poverty.

### *2.3 Collaboration VS Conflict: beyond the dichotomy*

In synthesis, water/rivers governance and related institutions requires collaboration amongst various actors. At the same time, collaborative approaches need to be carefully discussed in the lights of reflections about unbalanced relations of power and marginalized communities. The critical point is to allow a broad participation of community members, including underprivileged citizens, in the democratic debate about water/rivers, and more generally about ecosystems. In other words, some "missing actors", yet legitimate actors, may be found excluded out of the decision-making process, whose unbalanced relations of power can be easily recognizable. Within this inquiry, these phenomena have been framed as unavoidable aspects of an exploitative attitude, where exploitation is intended in terms of natural resources, as well as human/social resources. In order to overcome exploitation, some reflections have to arise and to allow a shift toward different ways to tackle the challenge. This is not always an easy task, and planners are called to explore and propose possible solutions. If planning research is developed interacting with key-actors, it may be an opportunity for understanding how to overcome this impasse, intertwining theory and practice. This inquiry looks for windows of opportunities (Healy, 2003) regardless of hurdles; in this case, windows of opportunities are intended as context-based possibilities for integrating underprivileged citizens in the debate about water/rivers, and for improving the overall health of the social-ecological systems as a whole. Next paragraph describes why and how a specific research approach has been shaped in a peculiar context where "silent" conflicts, i.e. conflicts that are not fully expressed because of a lack in public debate, and "partial" collaboration, i.e. those efforts that do not include the majority of local actors, are underway (Selznick, 1949; Payne, 2006).

## **3. ASSUMPTIONS, QUESTIONS, EPISTEMOLOGY AND METHODOLOGY**

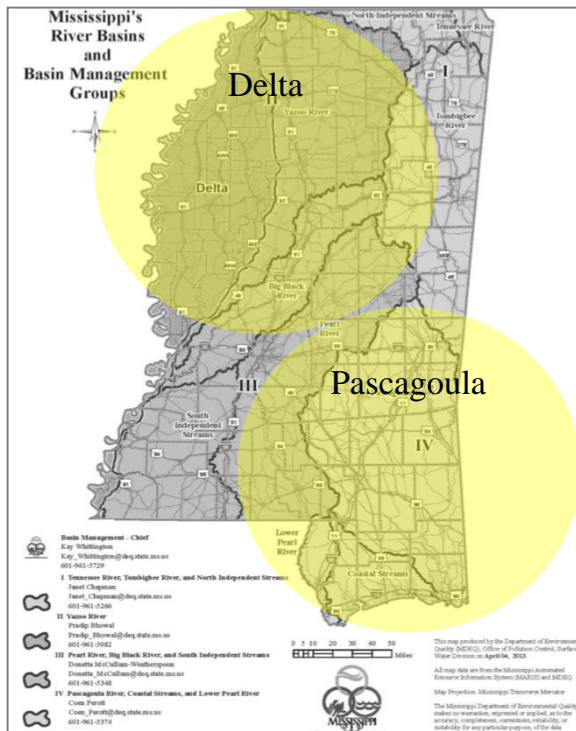
This investigation moves from three interconnected assumptions: (1) UN Resolution and common sense suggest that citizenry have to be fully aware and widely involved in water/rivers governance; (2) water/rivers governance is thus a mirror for the status of the democratic debate in a specific context. Looking at their management, it is possible to understand societal dynamics; (3) societal dynamics are complex. Conflict does not exclude collaboration and vice versa, rather a balance is desirable otherwise aberrations appear. Uncritical consensus building leads to maintain unfair relations of power. Abuses remain hidden, if collaboration is built upon myths that confuse the deliberative debate. On the other side, the perennial exacerbation of

conflicts, in all its forms, does not allow to face challenges and to achieve common goals. Research questions explore how to reasonably face Social-Ecological challenges, and what specific approaches are needed, in conducting research as well as in nurturing planning practices. As a matter of fact, “what counts as knowledge and what is the relationship between the researcher and that being researched [...as well as...] what are the process and the language of research”, i.e. epistemological choices (Creswell 2013, p. 21), determines research findings. In other words, the way research is conducted is strictly intertwined with the results, and it has to be clearly stated. Specifically, the epistemological choices beyond this paper are founded on the mechanism of "double hermeneutics" (Giddens, 1982). This principle summarizes the concept that researchers study societies which researchers are contemporarily part of. In this respect, researchers are, at the same time, subjects and objects of their studies. In the specific case of a SES, “the research object” is the decision-making process occurring in the human/human and human/nature interaction, which occurs for example in water/river basin. Within these SESs, there are various actors that are part of an "extended community of learners"; researchers themselves are part of these extended communities of learners (Michael D. N., in Gunderson et al. 1995) and interact with them through relations of reciprocity. This means that: first, researchers have to share their own biases with other members of the extended community of learners; second, researchers have share lessons learned within the extended community of learners. Recalling Giddens (1982) there are “two possible modes in which the social sciences connect to their involvement in society itself: as contributing to forms of exploitative domination, or as promoting emancipation” (ibid. p.14). The latter is the option that has been pursued within this inquiry. Two methodological approaches, which are consistent with this epistemological choice, have been blended. The first one is what Flyvbjerg (2001; 2004) defines as *Phonetic Research*, or research that is based on practical-value rationality (i.e. the English expression for the Aristotelian word *Phronesis*). According to Flyvbjerg, *Phonetic Research* moves from generic leading questions, that are basically ethical questions, such as: “Where are we going? Is this desirable? What should be done? [...] Who gains and who loses, by which mechanism of power?” (Flyvbjerg 2001: 60). The same ethical questions may be considered at the core of Action Research (Lewin, 1948; Whyte 1998; Reason and Bradbury 2001). “There is no ‘short answer’ to the question ‘What is action research?’ [...] A primary purpose of action research is to produce practical knowledge that is useful to people in the everyday conduct of their lives. A wider purpose of action research is to contribute through this practical knowledge to the increased wellbeing – economic, political, psychological, spiritual – of human persons and communities, and to a more equitable and sustainable relationship with the wider ecology of the planet of which we are an intrinsic part. [...]; it is to liberate the human body, mind and spirit in the search for a better, freer world” (Reason and Bradbury 2001, p.2). Although the differences



between AR and other research approaches, including *Phonetic Research*, have been strongly emphasized in terms of common misunderstandings (Saija, 2014), the reasons why AR is referenced within this inquiry is connected with the investigator's own biographical history (Pappalardo, 2014). As a matter of fact, the way the inquiry has been designed is related to having conducted AR in other contexts, where the necessary preconditions occurred. In a nutshell, AR requires long-lasting academic-community partnership that may produce reciprocal learning and affect reality, during the process of "doing research together", scholars and community members together (Reardon, 2006; Fortmann, 2008), in order to try to generate an impact to society. *Phonetic Research* as well requires specific conditions in order to be developed, such as the possibility of sharing research findings through mass media, trying to generate an impact to society (Flyvbjerg et al., 2012). The ways AR and *Phonetic Research* try to generate an impact to society are profoundly different, but in both cases public outcomes are necessary. What if the same ethos of impacting reality does arise in context where there are not opportunities for enhancing public debate? Specifically, where "silent" conflicts and "partial" collaborative efforts are underway. What if the one-a-one dialogue between researchers and key-actors, in the form of interviews in depth, may be an opportunity for exchanging knowledge through a reciprocal learning process? What specific tools need to be designed and implemented in order to trigger critical thinking, during the process of conducting interviews itself, and to let different actors understanding other actors' perspective? These three questions have been asked as the base for implementing a specific methodology, defined as Maieutic Research, which has been articulated as follows. The Case Study Method (Yin 1984; 2003; Flyvbjerg, 2006; 2011) has been used in order to give structure to the inquiry. The unit of analysis has been identified with the political boundaries of the State of Mississippi, which has been then subdivided in multiple sub-units, according with the specific characteristics of the context. In particular, two extreme polarizations have been identified (see picture 2): the Mississippi Delta has been considered the main sub-unit, and the Pascagoula River has been presented in contrast, for having different yet complementary characteristics. Following the principle of triangulation, data have been collected using three sources of evidence: archival documentation, direct observation and interviews in depth with 25 key-informants who have been selected amongst groups of governmental and non-governmental actors, as well as researchers and educators, in

about one year<sup>2</sup>. Interviews have been at the core of the research project, not in terms of data-collection, but in terms of generating reciprocal exchange of knowledge and triggering critical thinking. Biases, frames of reflections (Rein and Schön, 1999), local knowledge and story lines (Fisher, 2000; Sandercock, 2003; Fisher2009), including the investigator's ones, have been contaminated in order to understand different approaches to action, and possible paths toward solutions for controversies. Specifically, a video has been prepared for sharing the investigator's biases with the interviewees, together with a detailed letter of presentation and motivation.



**Picture 2.** Map of Mississippi River Basins. Source: Mississippi Department of Environmental Quality. The two polarizations have been highlighted.

These tools have been the bases for engaging key-actors in the interview process, which lasted about two hours for each interviewee allowing a deep contamination. At the end of the research project, another video<sup>3</sup> has been produced in order to put together interviewees' various frames of reflections, in the effort of generating an exchange of perspectives amongst them. A final letter, addressed to all Mississippi citizens, has been produced and openly shared, starting with the 25 key-actors and adding more recipients, in order to try to trigger critical thinking amongst them. For the academic purposes, interviews have been then synthesized and discussed in a *Mississippi Tale*, as it follows, with an ethnomethodology approach, i.e. a contamination between the

scholar's perspective and the interviewees' ones, "for examining porous relationships among social phenomena" (Pascale, 2013).

#### 4. OVERCOMING EXPLOITATION? A MISSISSIPPI TALE

In *Beauty, Health, and Permanence*, Hays (1989) synthesizes years of debate about controversial topics and events in the U.S.A., such as: engineering infrastructures including dams and related ecological concerns; natural resources conservation programs; citizens' alliances; litigation, collaboration, and regulation. After years of discussion, one lesson has been learned: conflicts and possibilities for cooperation are connected to the systems of values and interests

<sup>2</sup> This research project has been funded through a EU exchange program called Beyond Frontiers and implemented at the University of Catania; and through a Fulbright Fellowship for PhD Visiting Scholar.

<sup>3</sup> Both videos are available at <http://startingfromtheriveragain.weebly.com/rivers-stories.html>

that shape this variety of scenarios (ibid.). As a matter of fact, being vital resources, water and rivers may generate conflicts due to different actors' perspectives, and they may also be catalysts for cooperation (Wolf, 2007). Narrowing the scenario to the specific context of Southeast U.S.A., where Mississippi is located, Scholz, Stiffl et al. (2005) study impaired rivers, water quality, water scarcity, and subsequent litigations within the boundaries of Florida. Both Florida and Mississippi belong to the group of States that the U.S. Environmental Protection Agency (EPA) classifies as 'Region 4' as they share similar characteristics. Stiffl et al. highlight how collaborative practices:

“Create spaces where adversaries can explore together and develop agreements that leave them better off. Science advances; solutions emerge; but conflict lives on. Only now, it does so with new social and political rules and structures that encourage more efficient and perhaps more equitable next steps.” (pp. 237-238)

After an overview of the State named after the Great River (4.1), the *Tale* focuses on the Mississippi's floodplain, the Delta: being an highly transformed area that serves large-scale agriculture purposes, it is the powerful economic core of the state (4.2). The Delta presents phases of crisis, conflicts, reorganization and collaboration in terms of Social-Ecological Systems (4.3) and Common Pool Resources (4.4). In this scenario, Delta African American citizens still live in poor socio-economic conditions and they are not part of the Delta bottom-up collaborative efforts for water governance (4.5). Despite these challenges, windows of opportunities do exist in the Delta; their goals are concerned with improving the overall conditions of the floodplain's environment and citizenry (4.6). Another geographical unit within the State of Mississippi offers a complementary planning lesson based on ecological awareness: the Pascagoula river basin, one of the most preserved free-flowing aquatic systems in the entire nation (4.7).

#### **4.1 The State named after the Great River. Setting the stage**

On March 1<sup>st</sup> 2013 a group of Native American women, Ojibwe tribe, began their *Mississippi River Water Walk*, from Lake Itasca Minnesota, to the Gulf of Mexico, from the Mississippi River's headwater to its mouth. On this pilgrimage they carried a copper pail full of clean Lake Itasca water. Along the way, they asked for and received spiritual and material support to accomplish their mission. This mission was astonishingly clear: to pray for the water; to enhance awareness and to demand responsibility in order to collectively improve the *Great River* (in Ojibwe language) through the delicate balance between human activities and Mother Earth. On May 3<sup>rd</sup>, at the final healing ceremony, they symbolically poured the pail's pure

contents into the *dead zone* of the Gulf of Mexico. Science identifies the *dead zone* as a *hypoxic area*, i.e. an aquatic ecosystem with low levels of dissolved oxygen in the water due to an excess of algal growth. This excess of algae is related to an overload of nutrients, primarily caused by industrial agriculture, in particular corn and soybeans crops (Alexander et al. 2008), whose runoff is a vehicle for nitrogen and phosphorus diffusion. In 1997, E.P.A. established the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force in order to face the hypoxia problem that started during the 1970s. It took years of research, monitoring, public pressure, and NGO petitions to develop nutrient policies (Rabalais et al., 2002). Conflicts and collaborative efforts are a long-lasting process within States and Tribes in the Mississippi/Atchafalaya River Basin (MARB). The State of Mississippi is amongst them. Hypoxia is not the only challenge that the State faces as one of several consequences connected with high anthropic pressure on ecosystems. Next paragraphs provide a detailed discussion aimed at identifying other consequences, their preconditions and alternative approaches in Mississippi.

“Mississippi is probably the State with one of the poorest records of rivers’ stewardship in the all Country. [...] In the 1980s, the more I worked in research with rivers and streams, the more I began to recognize that [...] people did not understand how rivers worked. As a result of that, the general public was not very engaged in stewardship. And yet, when I talked to them, it was obvious that they liked rivers. [...] Then, throughout the State, in particular in the western part, in the Delta, there was a tradition of taking water from the land, because that area is subject to flooding. And when it floods, the prevailing idea was that it is a bad thing, in particular for agriculture. Certainly we do not want to have flooding that is harmful for the people, our homes, and our farms. But, I think it is also important to understand that we can change [...] the way we interact with the rivers and with the land [...]. So that the amount of damage is minimized, and we can get the benefit of flooding, in terms of natural resources, and soil fertility. [...]. The energy that makes the whole system work comes from the floodplain.”

This is what a fisheries biologist witnesses about the context of Mississippi. He highlights a paradox: the absence of care for rivers in the state named after the *Great River*. On one side, the State of Mississippi (125443 km<sup>2</sup>) is characterized by the presence of a unique aquatic ecosystem; an extended part of its territory (16187 km<sup>2</sup>) is situated in the Delta, the ancient floodplain of both the Yazoo and the Mississippi rivers, being the Mississippi one of the most important rivers on earth and a great basket of resources for inhabitants along its banks. On the other side, within the State’s political boundaries there is not a strong tradition of community-based organizations advocating for rivers; also, the State has about 116000 Km of impaired stream segments, the highest number in U.S.A. (EPA 303d List; in Shoreman and Haenn, 2009). The Mississippi river can also be seen a threat, being flood risk an environmental crisis that distresses the Delta since forests have been cut for large-scale agriculture purposes. The fisheries biologist also anticipates two different approaches in managing river ecosystems. With

a high degree of simplification, these approaches can be synthesized as: water exploitation based on economic rational *versus* river conservation based on ecological rational. The dichotomy economy/ecology is verified looking at the whole State. The economic rational is mainly expressed in the Delta, where natural resources are currently used in order to maximize economic profits through agribusiness operations. While the ecological mindset is reflected in another geographical unit: it is the 'largest (by volume) unimpeded river system in the contiguous 48 states', as defined by The Nature Conservancy. This national treasure is the Pascagoula River, located in southeastern Mississippi. It has been acquired by the State during the 1970s for public use. Although the distance between the Delta region and the Pascagoula basin is just about 320 Km (from Vicksburg to Lucedale), they are quite diverse. "If you go the Pascagoula River, there is a sense of place on that river, [...] people spend considerable time connected to that river. I do not know of that relationship in the Delta." These are words of another scientist who focuses on watershed management and holds a leadership role inside research institutions collaborating with Delta agribusiness stakeholders. In his statement, he describes different landscapes related with different planning approaches. While in the Delta region natural resources are managed in order to produce commodities and to maximize profit, the Pascagoula River has been preserved for ecological and recreational purposes. These approaches are based on stakeholders' antithetic ways of looking at the world: "The biggest dilemma is a fundamental difference of philosophy. It is not engineering. It is pure philosophy". These are words of an engineer, lawyer, public official and regulator. He has been working throughout the State and EPA Region 4 for decades, experiencing several environmental conflicts rooted in different systems of values such as the aforementioned dichotomy economy/ecology. In Mississippi, these values are also blended with another common southern belief: mistrusting governmental regulations. For example, in 1968 a federal program was established in order to protect scenic rivers in U.S.A.; it was not until 1999 that the State version of that program came into existence through the Mississippi Scenic Streams Stewardship Program (MSSSP), which went on a dormant stage after 10 years of activities.

"Because in the Deep South, landowners' rights are so important, and the government is so distrusted, Mississippi tried about six different times in order to enact some sort of Scenic River Program. Each time, it was voted down, and it never made out to the legislative committee. [...] Mississippi decided that if it was going to have a Scenic River Program, it had to be very friendly to landowners. It had to be voluntarily." MSSSP's main goal was to identify streams of ecological interest, and to guarantee the perpetuation of their status via voluntary Best Management Practices (BMPs). Mississippi landowners usually accept BMPs if property rights and economic interests are not threatened. Looking at the spatial distribution of scenic streams (Statute Section §51 - 4) the highest concentration of them is located in the Pascagoula River

basin, and none of them is located in the agribusiness core of the State, the Delta. “We have been able to have the Scenic River System except in the Delta. There is still a lot of political power in the Delta that kept those rivers from being included as potential candidates.”

“Those rivers are not rivers; they are just hydrological connectors, [...] and a lot of that has to do with farming.” “Typically in Mississippi the leadership has been agriculture. And typically agriculture is the Delta. [...] There is a local organization that watches after everything, let me put it in this way.” This is how stakeholders frame the problem of exploitation in Mississippi, specifically in the Delta, where a “local organization that watches everything” is the core of the problem in a highly disturbed ecosystem with a controversial presence of political power.

#### **4.2 “The energy comes from the floodplain”: the Delta. Setting the stage II**

Synthetically the Mississippi Delta can be described as a flat alluvial plain, a geographic and cultural unit that is enclosed between the levee system to the west and the bluff hills to the east. According to Smith (1954, p.3) “before the [Civil] war [the Delta] was known as the wilderness”. When planters settled during the 19<sup>th</sup> century, the local ecosystem was transformed in order to establish large-scale agriculture and lumber, and the “irrevocable alteration of local ecology” (Saikku, 2011, p.163) happened at the end of the century. Planters knew that the Delta “was rich enough to sustain the new cotton system for a long period of time, [...having been...] fed to a richness surpassing the Nile Valley on the regularly overflowing rivers” (Smith 1954, p.3). This ‘Alluvial Empire’ (Harrison 1961) has been shaped by the effort of ‘clearing’ the land from swamps, fighting against the *Great River* through various flood control measures, and organizing the fields for drainage. These significant environmental changes, so heavily human-driven, are connected with socio-economic dynamics that have given birth to one of the world’s most controversial portions of human history: the history of the *Old South*, with its precious values and traditions, which is also the history of the black and white racial divide that has inflamed American society since then. “For most of the people involved in the transformation of the Delta bottomlands, especially black slaves, sharecroppers, and agricultural workers, economic gain and social mobility remained severely limited” (Saikku, 2011, p. 170). Current socio-economic conditions reflect the legacy of this system; today the Delta hosts some of the poorest African American counties in the entire Nation (US Census Bureau) coexisting with the most profitable high-tech agribusiness operations (US Census of Agriculture). Agribusiness operators proudly state that they *feed the world*; they produce and export worldwide commodity crops such as cotton, rice, soybeans and corn, with an increasing production in corn acreage (Coupe et al., 2012). Soybeans and corn require high use of fertilizers that mostly contribute to

hypoxia, as explained in the prologue. The same exploitative mindset has also produced other ecological crisis as described in the following paragraphs.

#### **4.3 Social-ecological challenges and environmental conflicts**

The floodplain is a social-ecological system that is experiencing an exploitation phase and its subsequent effects. Amongst these effects, there is another Mississippi paradox. Coupe et al. (2012) synthesize the paradox with “Too much water, yet not enough water”. The same ecosystem faces: (1) drainage, overflow and flood control crisis, based on having maximized land’s availability for settlers and crops in the floodplain, that is naturally designated to abundant inflows (too much water); (2) Depletion of the alluvial aquifer, based on overusing groundwater for crops’ irrigation (yet not enough water). Regarding flood control measures, an environmental conflict has struggled Delta’s stakeholders for years; regarding water shortage, bottom-up conservation efforts are currently happening. This paragraph focuses on the flood control crisis and the connected conflict.

Drainage and flood control have been the central problem of Delta inhabitants before and after the catastrophic event of 1927 narrated by Barry (1927) when “miles of the narrow levee were crammed with refugees, almost of them there black” (p. 306). Furthermore, Harrison (1961) describes a flooding situation: “the water backs up the tributary streams and uses the area as a storage. The extent of area covered by backwater has increased as the levee program nears completion, with a consequent rise in flood levels of the confined river. The damage thus caused in backwater areas has been one of the unavoidable *costs* of valley-wide flood control” (Harrison 1961:166). In the Delta-Yazoo River Basin, the backwater area is situated north of Vicksburg, in Issaquena County. The Flood Control Act of 1941 authorized a project proposed by the U.S. Army Corps of Engineers, and the Mississippi Board of Levee Commissioners: the ‘Yazoo Backwater Area Pump Project’. Its goal was to reduce flooding in an area of 2500 km<sup>2</sup>. A pumping station had been proposed in order to move surface water from the Yazoo backwater area to the other side of the constructed Mississippi levee. The project had been opposed for concerns about wetlands, fisheries and wildlife. In 2011 EPA vetoed the project under section 404(c) of the Clean Water Act. “The Pump Project was very simple. It was just putting some pumps there [...]; those pumps would simply pull the accumulated water flowing from the North to the South, over the levee into the Mississippi River”: these are the words of an advocate for the project, who claims protection for Delta inhabitants from flooding, regardless of race and income. But other stakeholders think differently about the overall utility of the project, declaring that it is going to benefit just a restricted minority of landowners: “What they wanted to do is taking some water out, over the levee, putting back into the Mississippi. So they can get crops in

the ground earlier [...] The Pump was very expensive, and the value was not worth what it would cost to the taxpayers and the public; [...] also it would destroy large areas of wetlands that could be changed forever.” This conservationist advocates more suitable ecological solutions such as a nonstructural approach based on reforestation, to take place in a land that has already been highly impaired. “We have done a lot of things to the river, and we need to start thinking a little bit differently. Our struggle was a symbol of a desire for change.” On the other side, the supporters of the project were mainly part of the agribusiness sector; they claimed the necessity of flood control measures to protect agricultural plantations and local residents, arguing that: “People that live in the Delta can dialogue all day long. There are no problems. Problems come when people who do not live in the Delta want to dialogue about you, living in the Delta. [...] People who live farthest away got the best solutions for the problems where you live.” But representatives of the conservationist coalition claimed their stake into the discussion because: “They are doing that with public money and I pay taxes for that project. I use the Mississippi River and public lands with wetlands that are going to be affected by that project. Above all, they are going to do it with 100% federal money, because *the Delta is poor* [...]”, with an ironic note on the adjective *poor*. The pump project is thus an example of a conflict in terms of economic *versus* ecological rational; this conflict has been exacerbated by the fact that poor conditions of marginalized citizens were used as a justification for asking conspicuous federal aids that would have benefited rich agribusiness operations.

#### **4.4 Delta’s tragedy of the commons and collaborative bottom-up efforts**

As anticipated in the previous paragraph, despite the abundance of water since the 1950s the floodplain is experiencing serious cycles of drought (Palmer, 1983) that are worsening more and more. Furthermore, crops are shifting from cotton to corn (Coupe at al. 2012) fostered by federal subsidies for ethanol and high market prices. Corn requires more water, and the lack of strict regulation does not inhibit producers from reducing their withdraws. Approaching water as a CPR, the *tragedy of the commons* (Hardin, 1968) is currently verifying in the Delta, where appropriators are mostly part of the agribusiness sector. Ostrom (1990; 2010) recognizes the crucial role of institutional renewal with bottom-up mechanisms and multilevel interaction amongst governmental, non-governmental and community-based actors. In the Delta, the debate regards how to solve the aquifer’s problem. The debate is centered on the possibility of avoiding regulations and promoting voluntary practices based on the fact that local leadership and the most of producers are strongly resistant to federal government impositions, tending to adopt conservation BMPs only to protect the Delta profitable market. This ‘politics of unsustainability’ has been studied by ethnographers



Shoreman and Haenn (2009) and testified by some key-informants: “Everything has to make economic sense, avoiding costly government regulations”; “You have to make the connection that conserving some water on your farm does pay economically.” These words have been pronounced by a representative of a state public agency tied Delta F.A.R.M. (Farmers Advocating for Resources Management), a nonprofit organization started in 1997 by Delta leadership. In order to understand how institutions are changing in the Delta, it is crucial to overview how water governance has evolved throughout the years in the light of Ostrom’s studies. Mississippi jurisprudence follows English Common Law, like other southeastern states. Prior to 1956, Mississippi had sporadic *Supreme Court Cases* about water rights. They variously adopted the Riparian Doctrine, i.e. riparian landowners have the right to use the water. The 1956 legislation blended this system with the Doctrine of Prior Appropriation, which is rooted in Spanish and Mexican Civil Law and it is used in the southwestern states. According to Prior Appropriation, a landowner may acquire the right to withdraw and use water, with the rule “first in time, first in right” (Palmer, 1983). Then in 1985 Water Law changed, as an highly informed stakeholder states:

“In Mississippi, when we see this major legislative changing, they are typically provoked by a drought cycle. [...] The Delta leadership said to the legislator: we want to go away from prior appropriation, [...] that is straightforward to administer, but terribly unfair. [...] In 1985 we shifted from “first in time, first in right” to a “permitting approach”, so that when we have a drought situation everybody cuts back, and everybody gets some water. [...] This is much fairer, much more equitable among these users, but extremely difficult to be implemented.”

In 1988, another significant drought event awoke the concern about the emerging challenge. In 1989 a new public agency was formed under State legislation (Statute Section §51–8): the Yazoo Mississippi Delta Joint Management District (YMD). Its purpose is providing non-regulatory solutions for the declining aquifer. At the same time, Mississippi Department of Environmental Quality (MDEQ) and Delta F.A.R.M. are working in partnership in order to implement Conjunctive Water Use according to State legislation (Statute Section § 51 - 3), i.e. integrating “the ground and surface water resources within the state [...] in their use, storage, allocation and management.” (Statute Section § 51 – 3 – 1). MDEQ and Delta F.A.R.M. also argue with YMD in order to find solutions that may fit various appropriators’ needs. They barely agree in promoting a *bottom-up* approach and the general mistrust for federal government generates obstacles in gaining a multilevel approach to the problem as well as in overcoming this *local tragedy of the commons*.

#### 4.5 Missing bottoms

1985 Mississippi Water Law is very peculiar in the Southeast. Despite the general mistrust for governmental regulations, legislation is characterized by a regime of public ownership for water resources. § 51 - 3 - 1 clearly states that Mississippi water is a public resource and it has to be administered so that “the best interests and welfare of the people are served”.

“In the 1985 revision of the legislation, there is a very specific statement in the very first section: the water in Mississippi (surface water, groundwater) belongs to the people to be held, and trust, and managed accordingly. People do not own water. They have the right to use it, and the use will be regulated, but they do not own water. It would amaze you how difficult it has been for other southeastern states, which wanted to put in the law that the State owns the water, and landowners do not own the water. [...]”

At this point, a question arises: who does represent the *best interest*? Large-scale agriculture is organized in non-governmental organizations that can advocate landowners’ interests. “We serve as representative of the farmers’ community at the regulatory table, to give them a voice. If you are not involved, you will not be heard” is what landowners declare. What about the other part of the *best interest*, e.g. the African American Community? Today agriculture is highly mechanized and the heirs of slaves live in disadvantage human conditions in terms of unemployment, education, food diseases, and quality of life (Mississippi Delta Report on Poverty, Inequality and Discrimination, 2001). Cobb (1960; p.231) states: “The Delta’s white minority had compiled an impressive record of neutralization and manipulation of federal policy initiatives, in large part because the region’s black majority remained politically powerless and socially repressed”. Some interviewees argued that the fault rather lies with the black leadership. In general the black/white mistrust is still a current issue in the Delta. It goes along with mutual accusation that undermines a desirable process of integration. Studies show (Cottrell, 2012) the actual influence of traditional politics in Mississippi as defined by Elazar (1984); the leadership tends to maintain the *status quo* and to control the social structure according to its values and needs. Going back to water governance, it sounds reasonable to say that the *best interest* cannot be defined without listening at the majority of Delta citizens. Water is not just a CPR for large-scale agriculture. Water flows through SESs such as rivers, and their existence has a practical value for underprivileged communities. For example, Brown and Toth (2001) have studied African Americans’ dependence on subsistence fishing. When still possible, fishing is a “stable, inexpensive, accessible, and desirable food source all year round for both whites and blacks, but in different ways [...being...] an important part of economically-marginal people’s lives” (p.104). A representative of the African American community, declared:

“When I was a child, we had fishermen that actually lived in Glendora. Back in 1940s, the Tallahatchie River, which originally flew through Glendora, was subsequently rechanneled, and made a strict channel. [...] Now the problem is that it is affected with chemicals, runoff from the fields, and those kinds of

things. No fishing now, in that great body of water. We should redirect it to what should be, toward something we all should work together on, to make that body of water a real natural resource for this community.”

Also, marginalized communities do not have a wide range of possibilities beyond their local environment. “We have to keep in mind is that people who live on the land, at least most of them, they are not mobile. They live with whatever is around them. [...] They do not have a voice” is what an ecologist declares. When asked about including the African American community within the decision-making process about water issues, some interviewees declared that: “they do not care, they do not really have a stake”. But an African American elected official, stated:

“I do not think it is the case of *not caring*. When they see airplanes flying over their head spreading chemicals for the agricultural community, they are concerned about what is in those chemicals, whether or not those chemicals are going to have an impact on their health, today or in the future. [...] Environment is a concern of the entire community, whether you may be African American or White or Hispanic.”

That is to say, asking practical value-rationality questions, this inquiry discovers that not only the agribusiness sector or the environmental movement have a stake in Delta water governance, as it has been verified with the pump conflict and the aquifer depletion. Including underprivileged citizens in the debate poses an EJ problem. EJ, as commonly intended in literature, is not a major issue in the Delta. All Delta inhabitants, regardless of race or income, experience the same environmental problems. However, a broader interpretation of EJ suggests that underprivileged citizens do not have access to resources and recreational opportunities beyond the surrounding natural environment. Resources’ constant degradation penalizes those citizens because of their narrow range of possibilities and mobility. For example, surface watercourses give opportunities for subsistence fishing and recreation, but they are threatened by hydrological impairments and fields’ runoff. What if the decision-making process leads to other environmental changes that do not take into account underprivileged citizens’ needs? Furthermore, the lack of both environmental quality and human equality suggests the necessity for policies that allow not only environmental, but also socio-economic regeneration.

#### **4.6 Windows of opportunities for the floodplain**

The Delta reveals itself as a context where unbalanced relations of power have paralyzed the democratic dialogue amongst actors. Is the Delta hopeless? This question often arose while conducting this inquiry. An engineer who works in the Delta for a federal agency has a firm idea: “There is no problem too big. [...] But people have to make decisions and to do action; and then we have to reach more people [...] We cannot stop and wait that others will do it for us.” An

ecologist adds: “You can always fight, but there have to be people out there willing to sit down and find alternatives and solutions. [...]” Windows of opportunities do exist in form of partnerships and grassroots initiatives. There are examples that may allow an inclusive dialogue amongst marginalized citizens, agribusiness operators, engineers and ecologists, Delta inhabitants, institutions, if they all can sit down and find alternatives and solutions. Some of them are already working toward this direction. For example, the Lower Mississippi River Conservation Committee (LMRCC) is a coalition of public agencies in the Lower Mississippi River Basin. Through the *Lower Mississippi River Resources Assessment* they partner with some non-governmental stakeholders in order to find long lasting solution for the Lower Mississippi River. The Delta is part of their areas of interest. US Army Corps of Engineer and ecologists are active cooperators in this experience that somehow overcomes the pumping conflict: “I spent years fighting against the Corps, and now I am working with the Corps. [...] LMRCC tries to bring a little bit of balance back in realizing that the river can be managed better for industries, for agriculture, for shipping, for the threats of flooding. But also, for the ecological values, for fisheries, for birds, for recreation.” Amongst these non-governmental stakeholders there is a Delta canoe company that organizes fieldtrips to the Mississippi River for schools and the general public. The small canoe company also runs an apprenticeship program for local underprivileged youth, in order to train them in swimming, canoe-making, paddle construction, and river guiding. The company’s inventor, stated: “I realized over the years that we are living on the banks of the biggest river in North America. [...] And yet no one was getting out on the water. Not to say that there are not people interested, [...] it is natural you want to see the Mississippi River when you get close to it.” The canoe company provides experiential opportunities in order to reconnect people with the *Great One*; at the same time, it is creating experimental jobs’ alternatives for marginalized citizens. They are also connected with another valuable experience: the Mississippi Delta National Heritage Area (MDNHA) partnership. MDNHA is inspired by the value of the Mississippi Delta as a unique place in world because of its main cultural features, such as the Blues, the King Cotton, the Civil War, the struggle of the Civil Rights Movement, the Great Migration, the significance of several writers such as the Nobel Prize winner William Faulkner. After a 10-year period of discussion, the MDNHA Enabling Legislation was signed in 2009. Its main goal is to promote networks of local stakeholders and educational opportunities based on the value of its cultural heritage. This planning process is conducted in an open way. The MDNHA coordinator works on his dream of rebuilding Delta’s identity toward a renewed sense of place and sense of community. He admits: “The question is: what can we do to improve a new sense of Delta economy for all Delta inhabitants? Not just economy, but reputation, to make people proud of where they live, make them value the Delta [...]. Why the people in the Delta acted the way they did in the past; why they feel the way they do today; why

they are important to America, why they are important to rest of the world. [...]” Amongst MDNHA partners, there is E.T.H.I.C. (The Emmett Louis Till Historic Intrepid Center). E.T.H.I.C. is a memorial museum dedicated to the civil rights struggle and located in the heart of the rural Delta. The vision of E.T.H.I.C.'s founder is expanding the Museum realizing a farmers' market, community gardens and a colonial kitchen, in order to teach local citizens how to improve their lives. About this project, he says: “In order to *feed the world* we have to allow individuals to do something for themselves, and take care of themselves. [...] We have been farmers all of our life! We know how to farm and how to grow things. And it should be natural that this is what we do here, [...] bringing individuals back to farm, making their own living.” Small-scale and family farms can thus represent another experiential opportunity in order reconnect a broken relationship between Delta citizens and the land. Several networks promoting sustainable agriculture are currently spreading throughout Mississippi. Although slowly, they are affecting the Delta as well, based on the idea that before *feeding the world*, Mississippi can feed itself.

#### **4.7 Complementary windows of opportunities for Mississippi: lessons from the Pascagoula River.**

While the Mississippi Delta is a highly disturbed river system due to large-scale agriculture's needs, the Pascagoula River is an outstanding ecosystem both for the state and the entire nation, where a fascinating swamp was left uncut for several decades assuming the characters of a pristine bottomland (Schueler, 1980; Herdon and Williams, 2005). The Pascagoula example shows that contexts are not homogeneous: within the same political boundaries it is possible to develop a different system of values, in this case, a deep ecological awareness that could not find enough space in the center of local power, the Delta. During the 1970s, The Nature Conservancy (TNC) joined with community leaders, state officers, and the general public in order to preserve this unique area. The Pascagoula River Wildlife Management has been established in 1976. The Pascagoula has been conserved because a synergy happened amongst a group of inspired people. After a long negotiation process, the State acquired about 162 km<sup>2</sup> of land to be protected for public non-consumptive use.

“We understood, still understand that crops are necessary, and timber is necessary. We were trying to have an example that we could hold up and protect. Since the 1920s it began a major clearing of land along the State of the virgin timber [...] converted in agricultural lands. The land use trend was telling us that if we do not do something pretty soon, there is not going to be a valuable track of land anymore [...]. People were telling me that I was wasting my time. There was no point to go to the legislator. They have no history of really supporting land acquisition for conservation. Of course I knew that.”

These are the words of a person who defines himself the *nuts and bolt* person during the epic process of accomplishing this significant public acquisition in the Pascagoula River Basin.

Bill, together with other inspired people, state officials, and a wide grassroots support, left a long-lasting legacy in terms of ecological awareness that still affects the decision-making process. "All the work that we have done in the past 30 years explains: this is the last river that we have and it is special." These are the words of an active ecologist working with conservation organizations along the Pascagoula River. Together with other conservationists, he stands up to any possible nuisance for the river, such as the project of expanding the Strategic Petroleum Reserve in the Tatum Salt Domes that would have highly disturbed the Pascagoula. This project was proposed in 2005 during the second Bush presidency and it was firmly opposed by a coalition of associations and citizens: "All I have to say is that one threat galvanized the support [...] that almost everybody absolutely opposed this project. And it saved the river. All we had to do is putting information out there, and everybody helped. We asked fishermen and other people. We had elected officials that signed petitions and said no. This is huge because these people usually do not get into the environmental movement, but on this issue, they were." The Pascagoula offers an opportunity for providing experiential education, recreation, fishing, and an overall enhancement of Mississippi citizens' ecological awareness. "We are loosing a conservation ethic with children [...]. We have to get them outside, get them to understand what is going on outside, giving them some basic appreciation of ecosystems." The Pascagoula is also a resource for subsistence fishing and it gives occasions for engaging underprivileged citizens in community projects taking care of a common ecosystem.

## 5. CONCLUSIONS

### 5.1 It is a Matter of Education. What Type of Education?

Various interviewees, with their different frames of reflection, highlighted three specific needs in Mississippi: 1) to recognize "silent" conflicts amongst various actors, i.e. those harsh differences of perspectives that are not fully expressed in public debate; 2) to overcome "silent" conflicts and uncritical consensus-building, through more opportunities for developing public debate; 3) to bridge different perspectives. These three needs are actually high-relevant contemporary issues that have been studied in other contexts, such as the problem of *Making Democracy Work* (Putnam et al., 1994), or the arising debate about building up a society based on an empathic drive (Rifkin, 2009) in order to allow the recognition of different perspectives (in other words, to allow "stepping into others' shoes"). Democracy, empathy and all those mechanisms connected with healthy social-ecological dynamics pose a problem of education. As a matter of fact, all interviewees agree on one point: windows of opportunities, regardless of hurdles, may be implemented through education. Interviewees discussed a variety of educational approaches (see Table A).

Moreover, interviewees have firmly stated the necessity of looking at youngest generations as catalyzers for change; as Gandhi (1933, in Kumarappa, 1953) states: "[...] all sound education is meant to fit one generation to take up the burden of the previous and to keep up the life of the community without breach or disaster [...]" (p. 34). Educating youngest generations, through practical experiences merged within the real world, represents a path to improve the quality of democracy, as in Dewey (1916). Interviewees have framed education has a glimmer of hope for whole Mississippi; still with Dewey's words, hope is "[...] that education may be a reality and not a name or a slogan [...]" for a sound philosophy of experience" (Dewey, 1938:116). Freire points out the necessity of triggering critical consciousness and connecting perspectives through the act of knowing: "[...] in the process of problematizing, any step made by a Subject to penetrate the problem-situation continually opens up new roads for other Subjects to comprehend the object being analysed [...]" (1974, p. 135). Dolci (1996) explains how Maieutic is the blend of all these tensions, aimed at allowing an evolutionary and transformative path that may help overcoming critical phases.

Table A: Various educational approaches as defined by interviewed actors.  
The arrow shows a crescent level of maieutic self-determination generated by different educational approaches

Groups of Actors	Key-lessons on Education	Interviews' excerpts
Scientific community working with Delta agribusiness	<b>A)</b> <b>Implementing outreach activities</b> in order to involve Delta farmers in <b>environmental conservation efforts</b>	"We can come out with the science that we need to implement, but we also have to be able to change the culture and educate the users of the resources, primarily the farmers."
Agribusiness NGOs	<b>B)</b> <b>Cooperating with fellow farmers</b> to champion the environment through <b>BMPs</b>	"There is a successful story of a landowner, in the Harris Bayou watershed in the Delta. [...] This person also fishes in the Gulf of Mexico, so he recognizes the problem. He makes the connection between the Gulf of Mexico and his farm. [...] In his farm, we had numerous tours, demonstration days."
Ecologist community	<b>C)</b> <b>Experiencing</b> natural ecosystems learning from them, gaining the awareness that <b>taking care of rivers is mostly an act of self-respect</b>	"I grew up fishing. [...] I have always loved to play in rivers, to look underneath logs and to see what was there. The creek where I played was a great teacher. In someway it thought me more about biology and ecology than anything I could get out of a book, or at least it validated the things that I read."
African American community	<b>D)</b> Improving the <b>public education system</b> in order that all Mississippi citizens may have the opportunity to learn how to practice <b>self-determination</b>	"You probably do not have as much education [...]. It does not mean that the African American community is not concerned about the environment"
Mississippi scholars who practice a 'liberation approach to pedagogy' (as in Shor and Freire, 1987)	<b>E)</b> <b>Catalyzing self-determination</b>	"Education gives options, economic, social options that you can exercise in life. [...] You can choose where you live and what you do, and this is what education is; it is liberation. It liberates people to stay where they are, to move some place new, to pursuit their dreams, and to invest in their history. [...] Ultimately, when people are educated, it is more likely that they become enlightened, that they understand that we are connected to each other, and that brighter futures are more probable through working together. [...]"

Table A can be framed within various streams of literature regarding education: A) education as outreach (Stuart et al., 2010), B) education as learning to cooperate together (Watson, 2014), C) education as hand-on activities (Branchini et al., 2015); the aforementioned three approaches refer to the macro category of environmental education. The debate referred

to the quality of public schools (D) is the crucial point that opens up the narrow focus of environmental education to a broader discussion regarding social capital and the whole educational system, with its positive effects on the environment itself (Lamore et al., 2006). Finally, the highlighted row (E) expresses what this article argues. Having been specified that: 1) environmental education has been commonly addressed through specific codified activities; 2) environmental education has to be connected to the whole improvement of the public education system; the core lesson is that: 3) environmental education has to be approached through mechanisms of self-determination. In other words, environmental education may be an opportunity for experiencing feasible path for holistic regeneration of the whole social-ecological system, in its physical as well as immaterial dynamics. Although this may be a useful lesson for all social-ecological systems, it may be specifically valuable in contexts where: 1) high challenges undergo; 2) top-down approaches do not work; 3) bottom-up efforts risk to exclude the majority of the "bottoms" because of unbalanced relations of power. That being said, next paragraph explains specificities about a Maieutic approach to developing planning research that has generated these lessons.

## **5.2. Maieutic Planning Research. Key lessons.**

If one recognizes that the way a research project has been developed strongly influences its results, *a posteriori* reflections on methodology are necessary in order to highlight crucial points that may be useful in developing other research projects. Moreover, in this specific inquiry, a mixed methodology has been implemented in order to allow a meaningful investigation in a specific context. This mixed methodology, defined as Maieutic Research, requires clarifications. Precisely, the experience of having been an Action-Research (AR) scholar during other research projects has led the investigator to conduct the research project with an attitude of reciprocity, proper of AR, i.e. a continuous exchange of biases, knowledge and perspectives with various actors. AR has not being conducted because a university-community partnership has not being implemented, and the process of formalization of knowledge has not being developed in synergy with community members. This fact occurred primarily for contextual obstacles; then, the idea of shaping a peculiar research strategy arose. However, the process of production of knowledge has been conducted through a porous exchange amongst the investigator and all the involved actors. Moreover, *Phronetic Research* has inspired the way the case-study research has been designed, specifically regarding the way ethical questions have been posed. However, the act of sharing findings through mass media has not been implemented, because other tools have been tested. Specifically, the introductory video and letter have been prepared in order to allow the process of sharing biases; the final video and



letter have been spread with the intent of building-up a dialogue through a polyphony of voices; in other words, the final products have been implemented in order to allow interviewees to "step into others' shoes" through an empathic drive, catalyzing empathy as much as possible. This approach is connected with a specific necessity: to let knowledge come out of the dialogue, arise out of a process of self-reflection, be shaped through a continuous process of exchange and reframing, that accompanied all the research process itself, till the last formalization. This approach has been developed as an attempt to implement a Maieutic approach to planning research, considering the act of doing research as an opportunity for learning together. This has generated three key-lessons for planning researchers who may want to continue developing this methodology: 1) Planners can enter deep inside a context if they carefully listen at a polyphony of local voices; 2) Planners need to trigger the dialogue amongst these diverse voices; overcoming the surface level of conflict and consensus building processes; lighting a candle on unbalanced relations of power expressed in that context; 3) In order to encourage transformations, planners need to look for context-based windows of opportunities despite hurdles, working in synergy with local actors. The following final statement recalls the validity of this approach within the SESs theory framework.

### 5.3 Final remarks

*Panarchy*, named after the Greek god Pan "as an epitome of unpredictable change" (Holling 2001, p.396) is "a cross-scale, nested set of adaptive cycles. [...It] is a representation of the ways in which a healthy social-ecological system can experiment, benefiting from inventions that create opportunity while it is kept safe from those that destabilize the system because of their nature or excessive exuberance. Each level is allowed to operate at its own pace, protected from above by slower, larger levels but invigorated from below by faster, smaller cycles of innovation. The whole panarchy is therefore both creative and conserving. The interactions between cycles in a panarchy combine learning with continuity" (ibid. p.396-398). Radical transitions occur when abrupt changes and turbulence destabilize rules and social mechanisms. With a metaphor, "navigating transitions [...is like...] shooting the rapids [...] with several alternate vessel configurations" (Olsson et al., 2006); after a preparation phase, transformations happen and open several windows of opportunities. Mississippi could become a healthy social-ecological system if its educational process would allow to escape from the trap of exploitation and to follow panarchy cycles. Moreover, through empirical studies on five critical ecosystems, Olsson et al. (ibid.) observe the significance of building common knowledge and coordinating actors before and during transformations. The key, is therefore, to build the ability of improving collective action, connecting people, making sense out of complexity and allowing trust amongst

various actors. Olson et al. finally suggest key-lessons such as learning to re-conceptualize issues, to integrate diverse ideas, and to move across levels of governance. In times of rapid change, it is also important to maintain Social Memory as: “the arena in which captured experience with change and successful adaptations, embedded in a deeper level of values, is actualized through community debate and decision making processes into appropriate strategies for dealing with ongoing change” (Folke et al. 2005, p. 453). Maieutic approaches to research and education have been proposed to fulfill the cause. Keeping in mind that “[...] Knowledge is power but is new knowledge or newly organized knowledge that offers the greatest potential for shifting or maintaining power. Science provides much good in our lives, and scientists are members of a community of learners. [...]”.(Michael D. N., in Gunderson et al. 1995: 478). To the extended community of learners in Mississippi, this paper is dedicated.

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