



# **A NEW INSTITUTIONAL ECONOMICS PERSPECTIVE ON ENVIRONMENTAL ISSUES**

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# A NEW INSTITUTIONAL ECONOMICS PERSPECTIVE ON ENVIRONMENTAL ISSUES

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## 1. Introduction

The Nile river basin is a major resource for millions of people. It provides fresh water to densely populated area; it is the backbone to irrigation, particularly in the Egyptian farmland; and it is also a source of energy, through the delivery of hydroelectricity. Each of these functions imposes externalities of its own: building a dam upstream will have a direct impact on agricultural activities downstream. Appropriate arrangements are needed to coordinate these activities and monitor the alternative usages of a scarce resource.

There is more to the story. The Nile river basin is 6,695 km long, making it the longest river system in the world, covering a huge territory. With its main tributaries, the White Nile and Blue Nile, it joins ten different countries in its network, with Ethiopia, Sudan and Egypt its main beneficiaries, making it a strategic resource. A major pollution event in Ethiopia will have a direct impact on Egyptian farmers or inhabitants in Cairo. Therefore, an efficient coordination has to be transnational. It means building a complex basin-wide institutional setting among countries with different interests and distinct political arrangements.<sup>2</sup>

The Nile case reveals problems that the water sector share with other infrastructures, with environmental issues, and with even more general concerns such as the distributional effect of reallocation of scarce resources.<sup>3</sup> It also perfectly illustrates key issues in new institutional economics. (1) It explicitly refers to the now classical Coasian example of

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<sup>1</sup> I owe much to an anonymous referee and Bernhard Truffer for their comments and suggestions. The usual disclaimer applies.

<sup>2</sup> It took three years to produce the document supporting the Nile Basin Initiative, a multilateral agreement formally created in 1999 and that still remains to show its capacity to deal with the major problems raised by the international management of the basin.

<sup>3</sup> Think about the reallocation of part of the biomass from agriculture to the production of energy.

upstream externalities on downstream users. (2) With property and/or decision rights badly defined, or not defined at all, allocative as well as distributive effects can easily end up in conflicts, even violence. (3) Beside the economic transaction costs of finding appropriate ways to allocate and monitor a scarce resource among competing users, decision makers confront the political transaction costs of reaching and stabilizing an agreement among parties embedded in different institutional settings. (4) The efficient management of a scarce resource often requires societal changes to succeed, like accepting that water has an economic value.

The point I want to make in this short note is that the research program and concepts developed by Coase, Williamson, North, Ostrom, among others, help framing and exploring these problems as well as finding solutions, or at least pointing out conditions that any solution must meet. The next section provides insights on the organizational dimension, which is too often neglected in debates about environmental innovation. Section 3 takes a look at the biggest picture of the institutional setting, which imposes constraints and/or facilitates transitions. Section 4 concludes on issues that should be high on our research agenda.

## **2. Innovation viewed through organizational lenses.**

A central lesson from the new institutional economics is that there are many different ways to deliver and monitor goods and services, and all solutions suffer from flaws. Because of these flaws, there is constant pressure to find innovative arrangements. Selection operates among these innovations because some organizational solutions fit better with the characteristics of the transactions at stake.

Transactions cover more than the commercial transfer of private property rights. They encompass all *transfer of rights* among technologically separable activities. For example, rights over a common pool resource, say water, can be allocated with restrictions to farmers,

without giving them any property rights. Technological separability means that related activities can be unbundled, which is an essential condition to the delineation and transferability of rights. Once this condition is satisfied, transactions become possible under two conditions: (a) Whether private, public, or communal, rights must be defined and allocated; and (b) transfer of these rights requires the support of organizational as well as institutional devices. In a developed market economy, contracts typically do that, which explains their importance in organization theory and in so many debates about how to monitor environmental problems.

Defining, allocating, and transferring rights, say rights to pollute, involve transaction costs. These costs vary according to the mode of organization chosen and its adequacy to the transactions at stake. Williamson (1985, chap. 2) has identified three main attributes determining these costs: the transaction-specific investments required; the uncertainty surrounding a transaction; and its frequency. As it is now well known from an extensive literature and innumerable tests, the first attribute is particularly significant. The more specific to a transaction the investments required, the more exposed parties are to contractual hazards, particularly opportunistic behavior, and the more safeguards they will want. Farmers will not invest in irrigation systems if they do not have significant guarantees of access to water and some control over transactions on the resulting output.

In order to secure access to a resource, especially a scarce one, different organizational solutions are available or can be designed, although only a handful is usually feasible, either because of the characteristics of the transaction or because of institutional rules. For a long time, the literature has focused on the alternative between arranging transactions within an integrated entity, putting decision rights in the hands of a hierarchy, or using decentralized markets to perform this task. One can “make” or “buy” and the trade-off among these possibilities depends on the attributes identified above. To illustrate, the emission of CO<sub>2</sub> can

be monitored through a ‘command-and-control’ approach by public authorities, as when a specific agency defines and implements standards; or public authorities can transfer to a market the job of allocating and regulating rights to pollute they have defined ex ante.

A third mode of organization has recently attracted much attention, the so-called “hybrids.” These are arrangements in which parties maintain autonomous rights although they share some of them to jointly take advantage of existing assets or to create new assets. The resulting allocation of rights among partners, which may require the creation of an independent entity to monitor the venture and discipline parties, defines a complex and potentially innovative set of organizational solutions (Ménard, 2011). For example, the trade-off above suggested that a farmer can irrigate her crop by acquiring a pump and connecting directly to ground water (“make”), or contract with an operator that will deliver the water he needs (“buy”), usually subject to regulatory constraints such as quotas on water pumped or delivered. However, there is an entire set of alternative solutions. Our farmer might well join other farmers to collectively organize the usage and monitoring of the resource, with several possible arrangements (cooperative, joint venture, alliance, etc). Elinor Ostrom, who received the Nobel Prize in economics in 2009, has explored the advantages and difficulties of such collective actions (Ostrom, 2005).

Acknowledging the existence of a host of organizational solutions opens room for innovative answers to old questions. When it comes to the delivery of public goods and services or the monitoring of environmental problems, the exploration of these possibilities remains remarkably poor.<sup>4</sup> Most economists working on these issues have focused attention on one specific form, “public-private partnership” (PPPs). Let us assume that the water available to our farmer is polluted, threatening his health as well as that from the consumers of his products. Beside the traditional trade-off between a government strong enough to

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<sup>4</sup> The many negative reactions to the attribution of the Nobel Prize to Ostrom illustrate the difficult penetration of these ideas in economics.

impose new standards and organize directly the treatment of water (“to make”), and market-oriented authorities creating tradable rights so that polluters will have to cover the costs of treatment (“to buy”), public authorities can outsource part of their decision rights, even some property rights, delegating to a private operator the provision and management of the scarce resource. This PPP solution, perceived as very innovative, although implemented in some countries for quite a while, has fired enthusiasm of many governments and international organizations since the mid 1990s, with mixed results.

More radical innovations, like those favored by Ostrom who has exhibited the many successes of self-organized local communities, face skepticism among economists and policy makers, due to the problems of governance and free riding they raise as well as their difficult transfer to large communities. However, a transaction cost approach suggests that none of these organizational answers should be discarded *ex ante*: trade-offs should be analyzed in a comparative way, with careful examination of the costs of implementing and monitoring these alternative modes of governance. This is a demanding research program, but hardly escapable if we want to go beyond expectations of technological miracles and look at innovative organizational solutions to environmental problems.

Part of the difficulty in assessing the comparative costs and benefits of such alternatives comes out of the coordination problems raised when potentially conflicting rights over diverging usages are at stake. Farmers might organize a cooperative or rely on a communal arrangement rather than addressing a public agency or private operators to develop an efficient irrigation system; but they may have to deal with fishermen suffering from the depletion of water this system might induce, or with the authorities of a downstream city that depends on this resource. In that respect, all organizational solutions face problems of: (i) allocating property rights as well as decision rights as efficiently as possible; (ii) coordinating

parties on rights that complement or overlap; and (iii) enforcing the regulated usage of these rights. It also means that all solutions are institutionally embedded.

### **3. Institutional setting and societal transitions.**

Let us face it: the analysis of institutions, their fundamental characteristics, and how they interact with organizational solutions to complex allocations of rights, remains in its infancy.

Coase (1960) framed the ‘philosophy’ of the new institutionalists in that respect. Building on his contributions about the flaws inherent to all modes of organization, he pointed out that transaction costs plague the more general problem of the allocation of rights and their distributional effects, which are deeply embedded in institutional settings, for example the legal environment. Amazingly, all his examples have links with environmental issues.

Extending Coase, Davis and North initiated a more systematic analysis of institutions, defined as “the set of political, social, and legal ground rules that establishes the basis for production, exchange, and distribution” (1972, p.6). Organizations as well as individuals are players within these rules, determined by laws, customs, traditions, or beliefs. The research agenda thus opened developed in two directions: one focusing on the identification of which institutions matter and how they operate, the other emphasizing forces at work in institutional changes and the related societal transitions.

Four institutional components are of particular significance when it comes to establishing, allocating and monitoring rights: law, polity, administration, and ideology. The key role of legal regimes in shaping interactions among parties to a transaction is already well established, although the exact transmission mechanisms from laws to economic behavior remain relatively obscure. Laws play an important role in defining or confirming rights and the conditions of their transfer, for example rights to emit CO<sub>2</sub> and how they can be traded.

Their implementation by an independent judiciary is central in making commitments credible and disciplining parties to an agreement. The lack, or weaknesses, of such institutions at the international level partially explain the difficulties in building and implementing environmental rules about problems by far exceeding specific jurisdictions.

Such flaws also pave the way to political intervention. Numerous studies have documented the opportunistic behavior of governments in the definition and implementation of regulation, including environmental ones. However, the impact of the polity is more general and not only negative! The very nature of political regimes plays a role, for example in how externalities are monitored. The federal characteristics of the Australian system, with the significant rights devolved to states, made the negotiation ending in the Murray Darling Basin agreement particularly complex, with high political transactions costs but also strong commitment of all parties in fine. On the other hand, the cleaning of the Yellow river in China benefited from the decision capacities of a powerful central government, although it might also hamper the robustness of the agreement in the long run.

A third institutional component too often neglected, or perceived negatively, concerns the administration. Bureaucrats play an important role in designing and implementing rules. Competent administrators and international experts were essential in making possible the Nile Basin Initiative, creating hopes that geostrategic tensions in the competing usages of water could be solved peacefully. The lack of adequate bureaucracy(ies) to implement the agreement is part of its fragility.

Last, ideology, broadly understood as customs and beliefs shaping much of the strategies of actors to a transaction, is also part of the definition and possible solutions of environmental problems. In many reforms of water systems, beliefs that water is a gift of Mother Nature (or God) create powerful obstacles to metering, even when its purpose is not to support profitability but to make users responsible for their consumption of a scarce resource.



Changing perceptions of the impact of human action on our environment must parallel societal transitions if we want sound policies to be endorsed.

This brings into the picture the dimension of institutional changes, which are very slow and result from the combination of complex forces. Technology plays its role. The revolution in information and communication technologies might have a direct impact on environmental policies. The wide diffusion of the Fukushima catastrophe is already changing dramatically the perception of millions of citizens and pushing the European Union towards coordination of security standards and joint regulation of nuclear plants. However, it also reveals how difficult actual changes are.

In that respect, political transaction costs (North, 1990) can be a powerful instrument of changes ... or paralysis. Think about the enforcement of regulation intending to curb pollution. For historical reasons, regulation are embedded in laws and determined within political regimes identified to Nation-States. When it comes to environmental issues, this level of decision making is often inadequate: problems may require solutions at local levels, to which general laws may be maladapted or that centralized systems oppose; or they are transnational, which requires coordination exceeding the domain of national authorities. The management of fisheries within the European Union or of the cleaning up of the Rhine illustrates the difficulties at stake. Crafting new institutions, for example a common policy or a basin agency, confronts the political transaction costs of reaching an agreement and the risk of multiplying layers of decision-makers, bloodsucking well-intentioned arrangements. The complex design of the Nile Basin Initiative shows how a complex institutional setting intended to coordinate usages with strong environmental impact might end up into continuous political bargaining, at risks of bursts of violence. Is institutional homogenization a solution in the long run, if at all feasible? That raises another issue: eliminating or reducing drastically

the diversity of institutional arrangements might confront problems similar to the reduction of variety in ecology. These are terrains that require much more exploration.

#### **4. Conclusion**

This short essay suggests that the new institutional economics can provide powerful tools and useful insights in analyzing environmental problems and assessing potential answers. Three key concepts developed by NIE: property rights, contracts, and transaction costs, are particularly relevant in that respect, since they help understanding the intertwined role of organizational solutions and their institutional settings.

Indeed, when it comes to exploring environmental innovations, the emphasis on technological developments, for example the search for alternative sources of energy, too often ignores their embedment in organizational structures and the changes they may require. The development of green energy or smart grids may allow substantial reduction in energy consumption but may be conditional to a radically different approach to the organization needed. Shifting from a centralized network to decentralized provision might require dramatic changes in the allocation of rights, in decision-making process, and in coordination among parties. As shown by Ostrom for as different situations as the management of water, forest, or security, innovative organization, not technological innovation, is often the solution. However, the sustainability of alternative answers must be assessed in relation to the institutional context: what would be the transaction costs of an arrangement delegating the management of a common pool resource like the Nile basin to local communities and coordinating them?

Taking into account feasible allocation of rights, their distributional impact, and their costs remains a key element in determining if a technological innovation, or an organizational one, is economically viable and socially acceptable. It requires integrating the costs of societal

transitions. Switching the production of electricity from nuclear plants to renewable energies requires substantially different organizational arrangements, but also drastic changes in regulation, in pricing, etc., with distributional effects that cannot be ignored and with political transactions shaped and constrained by perceptions and beliefs that are integral part of the picture. An important lesson from the new institutional economics in that respect is that institutional answers are not the same everywhere<sup>5</sup> and require the support of “micro-institutions” deeply embedded in local traditions, customs, and beliefs. This also raises the challenging question of coordination at a more global level, which is inevitable when it comes to environmental issues. The design of innovative organizational arrangements is embedded in institutions and their adaptability. The problem is that they obey different tempo: their articulation determines acceptable transitions.

Exploring these questions defines a very demanding research program. One can hope that this journal will help filling the gap between what we know and what is needed.

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<sup>5</sup> « One size does NOT fits all”, contrarily to what was (and may remain) the guideline in international organizations.