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Policies, complexity and the need for cooperation in epistemic inquiry for the stable use of natural resources[☆]

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ABSTRACT

In the 1980s, in Mexico, political and economic decisions were made to increase food production and encourage transnational capital accumulation. Some of these resolutions were not justified by an adequate investigation of the consequences that could result from their application. In this paper, I argue that decisions made in the political, social, technological and economic spheres do not usually consider the complexity of the interactions between the elements that constitute existence conditions and incorrectly assume that the effects of these decisions can be predicted and controlled in a linear way. In reality, the effects are nonlinear, indirect, surprising, innumerable and irreversible, as illustrated by the case of Mexico. The policies implemented in 1985 resulted in the impoverishment of large population sectors of the country, damage to ecosystems, an exponential increase in migration, the enslavement of farm workers and the exploitation of children. On the basis that knowledge is incomplete and fallible, this article states that enhancing and promoting communication and cooperation among individuals from various groups, disciplines and communities will allow decision-makers to achieve a higher degree of certainty in social practices and policies and enable humans to live with less injustice and inhumanity.

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1. Introduction

The appropriation of the environment, land, resources and knowledge in the service of capitalist production interests has been justified from a stance often referred to as the “rationality of the modern age.” The notion of production conflicts with the lifestyles of indigenous communities in which the world is understood as a living space rather than mere property. The recognition that there is no single form of rational behavior or single method to obtain valid knowledge is based on a pluralistic understanding of knowledge, which rejects absolute rationality and extreme relativism because

these epistemological positions do not enable communication or cooperation between members of different cultures.

I start from the idea that any knowledge, including scientific knowledge, is configured into the practices of subjects. Knowledge depends on how we configure it in a context where there is no solid foundation (Cartwright et al., 1996; Duhem, 2003; Neurath, 1983). These practices are epistemic (knowledge-generating) and social. The practices are constituted by complexes of human acts that are guided by representations of the world, such as beliefs, models or theories, and the practices have a normative–evaluative structure. In addition, practices are associated with tradition and worldview and are supported by groups of individuals

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who share a set of assumptions that persist over time but also change, which is an important aspect of the dynamics of practices and, consequently of knowledge (Olivé, 2004, 1999).

The concepts that we form and the knowledge that we develop are influenced by a historical context, and to a certain degree, these concepts condition us to select goals and projects that reflect what we consider valuable (Kitcher, 2001). Accordingly, because knowledge is contextually conditioned, knowledge is biased.

The epistemic and social practices of a group constitute the world in which the group lives and the knowledge the group generates about that world (Kuhn, 1970, 2000). In different cultural communities, different epistemic, political and moral norms may prevail; these norms remain valid in their respective contexts. Whether epistemic, moral or political, the rules must be justified by legitimate reasons; that is, reasons that cannot be revoked by any other widely accepted rationale. The reasons must be accessible for any person related to the practices of a given cultural community in the historical and social conditions of a given time. Legitimate reasons provide us with a human-scaled criterion that guarantees that the practices that are guided by rules will succeed. This guarantee is of major importance because the practices have consequences that can be unpredictable in a society that involves individuals in decision-making and have complex, often pernicious effects on other societies.

Because knowledge is incomplete and fallible, the first objective of the present study is to show that, to increase certainty in our epistemic and social practices, communication is required between different groups. Communication requires cooperation and coordination between groups, which include members of different disciplines, scientific communities and cultures (Berkes, 2007; Futemma et al., 2002; Tucker and Ostrom, 2005; Vollan and Ostrom, 2010).

A disposition to cooperate requires different groups of people to be valued as members of a society upon which our personal life plans depend, at least partially.

This may be clear, for instance, in European countries. However, for people with significant cultural and socio-economic differences, such as those in Mexico or many other nations in Latin America and Africa, this social dependence is frequently forgotten.

For example, the construction of a social order that facilitates, for example, the stable use of natural resources requires that all stakeholders be involved and learn about the epistemic and social practices of other individuals and communities to design a plan with a more precise and comprehensive vision of the problems; that is, more information is required and more discussion and interaction among various groups (Díaz et al., 2011; Hess and Ostrom, 2011).

A recognition of epistemic and cultural plurality and the shared conditions of vulnerability in our time could help different actors create detailed plans to ensure overall coordination for solving problems (Cartwright et al., 1996, p. 245), such as the problem that 45% of the world's natural ecosystems are severely strained and have ceased to be functional, with the remaining 55% supporting the planet's biological life (by 2025, the latter figure will be only 30%) (Boege, 2008). Respect for cultural diversity is important because it is in indigenous communities and towns where coexistence

with regional biodiversity has led to the experimentation and development of the use of plants, insects and animals as food, medicine, clothing, personal hygiene and housing (Castillo and Toledo, 2000; Toledo and Barrera-Bassols, 2008). A significant part of those achievements are of importance in actual technoscientific development.

The knowledge of these communities can improve and help promote the conservation of ecosystems and help us survive (Berkes and Berkes, 2009; Berkes et al., 2000; Olsson et al., 2004; Turner et al., 2003). Of course, this statement does not mean that traditional knowledge is infallible or that it should be assimilated into scientific knowledge (Moller et al., 2004). My claim is that policies transform our existence conditions; therefore, to prevent partial and unjust decisions, policies must be derived from a plurality of practices and ways of life. Damage occurs whenever a global-scale strategy is applied to a wide range of contexts without considering the small-scale existence conditions.

A good example that illustrates the connection between global-scale decisions and local-scale existence conditions is the trade liberalization program implemented during the presidency of Miguel de la Madrid with the aim of reviving the Mexican agricultural sector by increasing imports and competition. In this neoliberal agenda, policies were based only on international economic criteria: the goal for the agricultural sector was to reduce the labor force from 26 to 5% at the national level because, according to the technocratic vision that was in vogue, no developed country employed more than 10% of the economically active population in agriculture (see Banco Mundial, 2003). This reduction was aimed in particular at cereal and grain producers with low productivity, especially subsistence-level producers. The idea was that once these farmers were excluded from grain production, the sector would be left open to more efficient and internationally competitive farmers, encouraging the redevelopment of the farms.

The mass production of corn and the policies that support it were possible thanks to products derived from biotechnological research on corn hybridization by companies such as Syngenta (Switzerland). This process of hybridization crosses two races of maize to strengthen the plant. The seeds of the hybrid yellow corn N83-N5 patented by the Swiss company in combination with the fertilizers and herbicides that are part of an agricultural chemical package can produce 12 tons of maize per hectare, as opposed to the 1 ton per hectare that farmers produce by traditional methods (Interview with José Luis Feregrino. Land Development Coordinator. Syngenta Agro, S.A. de C.V. Mexico City).

Agricultural policy reforms accelerated the migration from many rural communities, exceeding all expectations. One consequence of the crisis of profitability in traditional agriculture is the close link between low levels of productive development and temporary and permanent migration under conditions of high marginalization. It was expected that states with a higher number of units of subsistence farming and low levels of income and production technology would suffer a larger impact from the migration of corn producers as a paradoxical result of the reconversion programs of the Mexican country (González, 2009). Among other complex effects of agricultural policies is the accelerated deterioration

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