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Title

Four conceptual issues to consider in integrating social and environmental factors in risk and impact assessments.

Abstract

In the last twenty years, both the increase in academic production and the expansion of professional involvement in Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) have evidenced growing scientific and business interest in risk and impact analysis. However, this growth has not brought with it parallel progress in addressing the main shortcomings of EIA/SIA, i.e. insufficient integration of environmental and social factors into development project analyses and, in cases where the social aspects are considered, technical-methodological failings in their analysis and assessment. It is clear that these weaknesses carry with them substantial threats to the sustainability (social, environmental and economic) of projects which impact on the environment, and consequently to the local contexts where they are carried out and to the delicate balance of the global ecosystem. This paper argues that, in a sociological context of complexity and dynamism, four conceptual elements should underpin approaches to socio-environmental risk and impact assessment in development projects: a theoretical base in actor-network theory; an ethical grounding in values which are internationally recognized (though not always fulfilled in practice); a (new) epistemological-scientific base; and a methodological foundation in social participation.

Introduction and objectives

In recent years the growth in academic production and professional application of Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) have indicated increasing interest in risk and impact analysis on the part of the scientific and business communities (Voyer et al., 2012;

Smith et al., 2011; Rowan and Streather, 2011; Tajziehchi, 2011; Dreyer et al., 2010). However, this growth has not yet translated into comparable advances in the main areas of weakness detailed below (Esteves et al., 2012): i.e. deficiencies in the integration of environmental and social analysis of development projects, and, in those cases where the social aspect is taken into account, weaknesses in technical and methodological analysis and assessment.

This paper examines the main reasons why these weaknesses remain. It argues that science, as a social institution, has entered a crisis of utility. In a context of social complexity, the classical mode of knowledge production (identified by Gibbons, 1994, as "Mode 1"), does not adequately address this. Also, the theoretical frameworks for explaining social reality need to address this complexity more effectively. Traditional theories of the "risk society" can be combined with more holistic and dynamic explanations, for example Actor Network Theory (ANT). The latter is in our view the theoretical framework which can shed most light on the socio-environmental relationships created by large-scale development projects. From the axiological point of view, we argue for the need to take into account ethical and political diversity in the socio-environmental context of projects, consistent with the diversity of information sources that are relevant to their sustainability. From the methodological point of view, we advocate social participation as a transversal strategy in the planning and carrying out of SIA, and as a crucial prerequisite for sustainability (including economic sustainability). Lastly, we discuss to what extent these theoretical, epistemological, ethical-political and methodological elements can be considered the bases for a greater integration of SIA in EIA, and which approach, in practice, would most improve the practice of SIA in development projects[1].

Literature and history review on social risk and impact assessment.

Risk and impact assessment of projects impacting on the environment, embracing the various dimensions (environmental, economic and social) that are acknowledged to be important for sustainable development, has been a focus of academic, scientific and political interest for several decades. The first environmental impact assessments were officially recognized at the beginning of the 70s, when the National Environmental Policy Act (NEPA) was passed in the United States.

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Since that time, and especially since the idea of sustainable development surfaced on the global agenda at the 1992 Rio Summit, the pace of the institutionalization of EIA and Economic Impact Assessment has quickened.

The most commonly cited general studies of EIA highlight the need for integrated assessment methods which would embrace the social dimension and take into account the distinctive features of affected communities (Bartlett, 1993; Baines and Morgan, 2009; Macklin and Hartog, 2004; Slootweg et al., 2001; Mahmoudi et al., 2013). These social and cultural factors are acknowledged to be critical for the success of development projects in infrastructure, public policy, and so on (du Pisani and Sandham 2006; Torriti 2011). But despite calling attention to the importance of territorial, socioeconomic, legal, cultural and public health issues, analysis in EIA does not normally go into sufficient depth to tackle adequately the complexity of the issues involved (Albergaria and Fidelis 2006; Canelas et al., 2005), or only serves to fulfil the legal formalities for the approval and implementation of the project (Esteves et al., 2012).

The specific study of social risks and impacts emerged as a discipline within the framework of EIA. Catton and Dunlap (1978) focus their attention on the social dimension of the environmental crisis of the end of the 20th century. Finsterbusch's study (Finsterbusch and Wolf, 1977) can be considered the first theoretical and methodological systematization of SIA; while Freudenburg (Freudenburg, 1989) gives a thorough overview of SIA since the mid-1980s. Two common themes of these first studies, as in the case of the EIA, is the difficulty of integrating SIA in EIA, and the flaws of “social accounting” in development projects. The discipline also exercises its own self-criticism, highlighting the need for theory building and greater methodological clarity (Lockie, 2001). International regulatory development in EIA has boosted SIA, and since the 1980s this has become a prolific area of study (Finsterbusch and Wolf, 1981; Soderstrom, 1981; Burdge, 1994; Becker, 2001; Barrow, 1997), especially in Anglo-Saxon countries and those with the tightest legislation on development projects. The International Association for Impact Assessment has developed a new guide for SIA, dealing with the key aspects of practice and debate in the field (Vanclay et al., 2015).

Social complexity, the dysfunctionality of traditional science, and development projects.

The complexity of social reality is a recurrent theme in the social sciences. Since the 1990s it has been located at the core of the most important sociological theories, in the work of Giddens (1998), Beck (1997) and Bauman (2001). “Theories of modernity and postmodernity” (Giddens, 2002; Bauman, 2004) are closely linked to “risk theory” (Beck, 1992), since in dynamic and complex social contexts, uncertainty, and therefore real and perceived risks, soar. What most interests us in this study is that these factors share the global scene with social dynamism and the troubled and unsustainable relationship between society and the environment. The current world situation, thus shaped, is reflected on the local level and, reciprocally, the latter defines the process of “globalization”: in other words, the whole set of social, economic, political and cultural processes that inform globalization are embodied in local contexts, in such a way that these become fundamental to analysing and understanding it (Featherstone, 1995).

Also the traditional, natural environmental sciences have shown some concern with the complexity of their fields of theorization and application. From the theoretical point of view complexity has been addressed by reformulating concepts (“chaos theory,” “theories of nonlinearity”), and on the methodological level through promoting systems theory (Stewart, 2001). Briefly, the reaction of the traditional sciences to complexity has been to concentrate on creating models to explain real phenomena. This, however, is a simplistic response to complex contexts and realities (Casti, 1996) which demand integrated and complex analysis and explanation. In social science, on the other hand, concern for the effects of complexity in its objects of study is intertwined with the very nature and evolution of the discipline. Some authors have argued that the development of the social sciences can be understood, in part, through the methodological solutions brought to the study of complexity. This has even hindered the practical application of social research, since it has not been possible to align it with the traditional positivist scientific criteria of reliability and validity (Stehr, 2001).

Authors such as Bourdieu (1988) and Gibbons (1994) have noted this lack of an effective response to complex realities. They clearly articulate the crisis of the traditional scientific mode of production (or “Mode 1” in Gibbons' terminology), whose main symptom is the difficulty traditional positivist science has in responding to society’s demands and expectations on the scientific system; a system which is becoming increasingly more self-referential, with values and objectives (Vesuri, 2014) ever more distanced from society’s expectations. This is a crisis which directly affects the criteria of validity and reliability in the scientific product, since validity should be congruent with the reality analysed and reliability should be of use in decision-making and

strategy design. Mode 1 is self-referential (thus hindering the extrapolation of knowledge to society), *generalizing* (seeking models that explain general processes or behaviours), and exclusively carried out by specialists and academics (thus belittling contributions from alternative sources; everyday experience, for instance).

The difficulty of integrating social with environmental analysis identified in the specialized literature of EIA and SIA can be observed in any field of scientific practice where both biophysical and social components must simultaneously be taken into account in order to construct valid and reliable knowledge of the object. The traditional scientific fields (the natural sciences of the biophysical object and the engineering based on these sciences) still share a *positivist* culture, which seeks to obtain regularity in models and laws applicable to any context or reality which produces the phenomenon, process or object studied. While the social sciences currently still share this mindset, both the characteristics of their object and their relatively recent appearance on the scene have given rise to "softer" or more heterodox methodologies. They have played down positivist methodological rigidity in order to better adapt themselves to their object of study, intrinsically dynamic, historical and context-dependent (Meagher & Wilson, 2002).

This complexity demands a science which is multidimensional, multi-paradigmatic and at the same time flexible, adapting itself to complexity (Krishna, 2014). Mode 1 production of scientific knowledge does not succeed in addressing either the needs or the functions asked of it both by society at large, and by the stakeholders (including the promoters) of large-scale development projects. In other words, research based on Mode 1 scientific production fulfils less and less well the task assigned it by funding bodies (i.e., to assess and monitor the risks involved in the project), while at the same time failing to inspire trust in local actors and communities. The latter complain of the negative consequences of projects, often rejecting proposals for one in their territory. Very frequently, affected stakeholders see the scientific practice associated with the development as biased and aimed only at addressing a single interest: that of the promoters.

The field of the design and implementation of development projects is a particularly interesting case of this growing dysfunctionality of science. It is an area where the natural sciences and engineering are more represented, both on a technical level and in decision-making. Its traditional criteria of knowledge production coincide with "Mode1". Its research methods, like those of the natural sciences, are also traditional. During the planning of the project, the relevant calculations, along with the calculation of risks (including financial risks), are made according to models or

generalizations built on known and measurable variables. This is the case, for example, for estimated needs in construction materials, the behaviour of these materials, the biophysical features of the territory where the project will take place, and relevant financial market forecasts (in mining, industry, etc.).

"Mode 2" scientific production, described by Gibbons, is more consistent with social demands on the scientific system; it is a more contextualized, transdisciplinary form of knowledge production, reflexive, responsible, and adapted to the multidimensional dynamism of its object. This mode can produce more valid and reliable information for a more realistic and workable form of knowledge, more consistent with reality and better adapted to the solution of real-life problems. The risks and impacts involved in development schemes would seem to be the perfect field of application for a more functional and, in essence, more plural science which effectively addresses the interests and/or needs of the various stakeholders.

In the design of development projects it is extremely common to ignore the aspects which give them real complexity and risk and are very rarely absent on the ground, i.e. social and cultural factors. The diversity of local actors, their relationships with each other and the environment, their communities' views on the potential effects of the development, etc. are examples of sociocultural aspects typically ignored or underestimated in the planning and implementation of these projects. The complexity of these factors, reflected in their context-dependency, historicity, dynamics and sensitivity, make them difficult to capture using Mode 1, and thus also difficult to account for in the forecasting (normally based on older models) involved in the design process.

Actor-network theory and its methodological implications

The theories of modernity and risk of Giddens, Beck, etc., are key to understanding complexity and change in social structure. However, during the 1990s, a new theory with a broader scope has developed (Latour, 1996; Prout, 1996; Murdoch, 1998, 2001); a theory which responds more holistically to the practical demands of socio-environmental integration, has greater methodological finesse, and is especially useful in the case of large-scale development projects. This is actor-network theory (ANT).

The social-science background to ANT is in network theory. This emphasizes society as process, and sees it as a web of interrelated nodes: thus for any given context, ANT describes the existing positions and their interrelationships. Thus nodes and relationships are the two practical features to take into account in research methods derived from this theory (Lozares, 1996; Wasserman & Galaskiewicz, 1993; Cressman, 2009). The present research team has demonstrated the usefulness of network theory for SIA in previous studies. In these cases, social network analysis uncovered social positions (stakeholders and their discourses) and strategic relationships to modify in order to adapt the city and urban planning to its inhabitants (Andreu, 2010), or in order to reduce the economic and socio-environmental risks and impacts of intensive crop cultivation (Domínguez & Relinque, 2014).

In contrast with traditional *sociology of the social*, ANT puts forward *a sociology of associations* (Pestrel, 2006). Social forces external to the actors, unperceived by them but recognizable and analysable to the social scientist, shape "the social" (for example, social groups, classes or institutions). But ANT redefines the object of sociology in a more micro, dynamic and process sense, focusing on the actors and their relationships: analysing the actors, understanding their views, their mutual influences, the nature of the relationships between them etc. It is a constructivist approach to the social, setting out from micro and hyper-contextualized positions.

ANT, in its most recent and advanced form (Latour, 2005; Tirado, 2005), can address more relevantly the contextual demands of SIA studies. Thus the most current version of ANT accepts that group formations are ephemeral, and subject to change in their contexts and in their circumstantial, often hyper-specific objectives. The individual and collective actors take up their positions in a contextualized and transitory way. Their positions are therefore relative by definition. The actions set in motion by each actor unfold across an intersubjective medium, and are seen as charged with the meanings given them by each actor, but also with those perceived or interpreted by the other actors. Additionally, physical objects (for example technology) are charged with meanings, and are constructed, used and interpreted subjectively and relative to the current position of each actor in the network.

In the specific context of SIA, situations of social tension and conflict between actors are the norm. A new and powerful actor arrives in the local social network, disrupting it. The project and the developer take up their place in the network and the other actors are forced to adapt their positions. For SIA studies, it is essential to understand in depth the points of departure, properties and

interpretations of each actor (positions of power, needs, relations with their surroundings, etc.). Knowing these subjective starting positions and how they interact and change due to their interactions is enormously helpful in understanding probable future changes in the network. The relationships in this network (along with their subjective meanings for each actor) become active elements, creating chain reactions of changes in the actors and relations making up the local network, and in this way giving rise to a new situation in dynamic, provisional and short-lived balance.

The methodological implications of these premises are two-fold. On the one hand it is crucial to *understand* the discourses in play, as they emanate from the positions taken up in the (circumstantial) context and in the social and political arena where the action takes place. Comprehending these discourses involves taking a constructivist, relativist and contextual approach (Luckmann, 2013). On the other hand, their contextual, ethical and subjective content seems to distance us from social science's traditional aspiration to objectivity in dealing with social facts (Durkheim, 1973). However, all these meanings (emanating from the actors, relationships, objects and overall context) are key to the definition of the socio-environmental reality. The focus of analysis shifts from *facts* to *meanings*.

Scientific and ethical requirements for preparatory studies for development projects.

Scientific research which aims to be useful should embrace and appraise all possible sources of relevant data on the object or problem to be solved. In a context of social relationships like that defined by ANT, it would not be scientifically appropriate to ignore or underestimate the privileged sources of information offered by the stakeholders of a development. Each stakeholder is a primary information source, uniquely situated in a circumstantial context, bringing into play the meaning of their position. Further, it would not be ethically appropriate to ignore or underestimate the views of any of the actors involved. Studies on the specialized literature and practice of EIA clearly indicate the need to reorient the scientific grounds of risk and impact studies towards more integrative and flexible models, capable of taking on the usefulness and necessity of a "civic science" (Cashmore, 2004). Specialists and professionals (mainly environmentalists, geologists, biologists, engineers, etc.) have noted that their studies lack the knowledge of the social (not only from social science but also from local actors) that they need in order for projects to be planned and carried out sustainably (both for the project itself and its environment). But they also lack awareness of how to integrate the

social into the forms, models and methods that they habitually use. This is where SIA can offer more as a discipline. Vanclay (2003) has established its principles in hierarchical form, as we describe below; and these principles are the foundations of ethical practice.

In the specific case of projects impacting on the environment, the exercise of science overlaps with that of ethics. Each project arrives weighed down with added scientific practice, with a whole sequence of geological, hydrological, geographical, economic, strategic, etc. studies, all of which are aimed at guaranteeing the success, i.e. the sustainability (in its various dimensions) of the development. A flaw or lack in any of the sources of information feeding into these studies could put the project's sustainability at risk. In other words the working objective of the application of science to the development would remain unfulfilled, or at least become more difficult to achieve within the planned terms and objectives. Thus ignoring or denigrating any of the stakeholders' views on the project would yield a negative result in terms of the validity and reliability of the scientific practice involved (and the eventual development itself). Further, this shortcoming would give rise to a negative charge in the ethical accounting of the project, violating internationally recognized moral principles. Here we could cite many well-known examples, such as the ExxonMobil or BP oil-spills (Gill et al., 2012), along with a host of others from the extractive industries (Kapelus, 2002).

In the (normal) case in which the developer pursues exclusively economic objectives, such a scientific defect, bringing with it also an ethical weakness, would also have consequences on the economic risks of the development. A recent worldwide study of social risks and their costs for mining developments (Franks et al., 2014) has shown how disregarding the social elements in preparatory studies can develop into conflict between the community and the developers. Although these do not always lead to open clashes, the misperception of social risk and the serious undervaluing of the local community's views (usually dubbed "unfounded" or "unscientific"), has caused delays costing up to $20m per week in projects with an investment of between $3,000m and $5,000m. The financial and insurance companies which guarantee these investments already include such risks in their premiums; in the case of the extraction sector (mining and hydrocarbons), Credit Suisse calculates $8,400m in investments at risk in Australia, with an average impact of 2.2% on the price of loans; while in Peru, where one mining project had to be redesigned due to social conflict, its costs increased from $3,300m to $5,000m.

When, as in the case of large-scale developments, the disruption of a highly complex socio-environmental context is foreseen, it is scientifically and ethically imperative to widen the "assessment community" (Funtowicz & Ravetz, 1992; 1993; Funtowicz, 2000). Through the inclusion of the various stakeholders in the plan to change the context, we strengthen effective monitoring of the development's social, environmental and economic risks; but also the ethical accounting of the scheme will be enhanced, with spin-offs for the developer's corporate social responsibility; and therefore this fully justifies a participative approach in SIA. (In Baines et al. (2013) there is an in-depth study on ethics in SIA practice, while Vanclay et al. (2013) give a more general overview.)

Political consequences of the participative approach

A properly carried out analysis of the stakeholders in the local context of a project should reveal the map of positions, relationships and meanings defining the social aspects of the context. The actors' similarities and differences in views, along with their links of affinity and antagonism, make up one of the analytical keys to SIA: i.e. the political landscape of the context and how it changes with the onset of the development.

The emergence into the public eye of such a scheme involves the sudden arrival of a new actor on the local political scene: the project developers. The developers' political ethics, i.e. their understanding of their power relationships with the other stakeholders in the local area, can be characterized by two basic factors: a decontextualized way of working (though shared with other actors capable of imposing this way of working) and a specific position in wider national and international political networks.

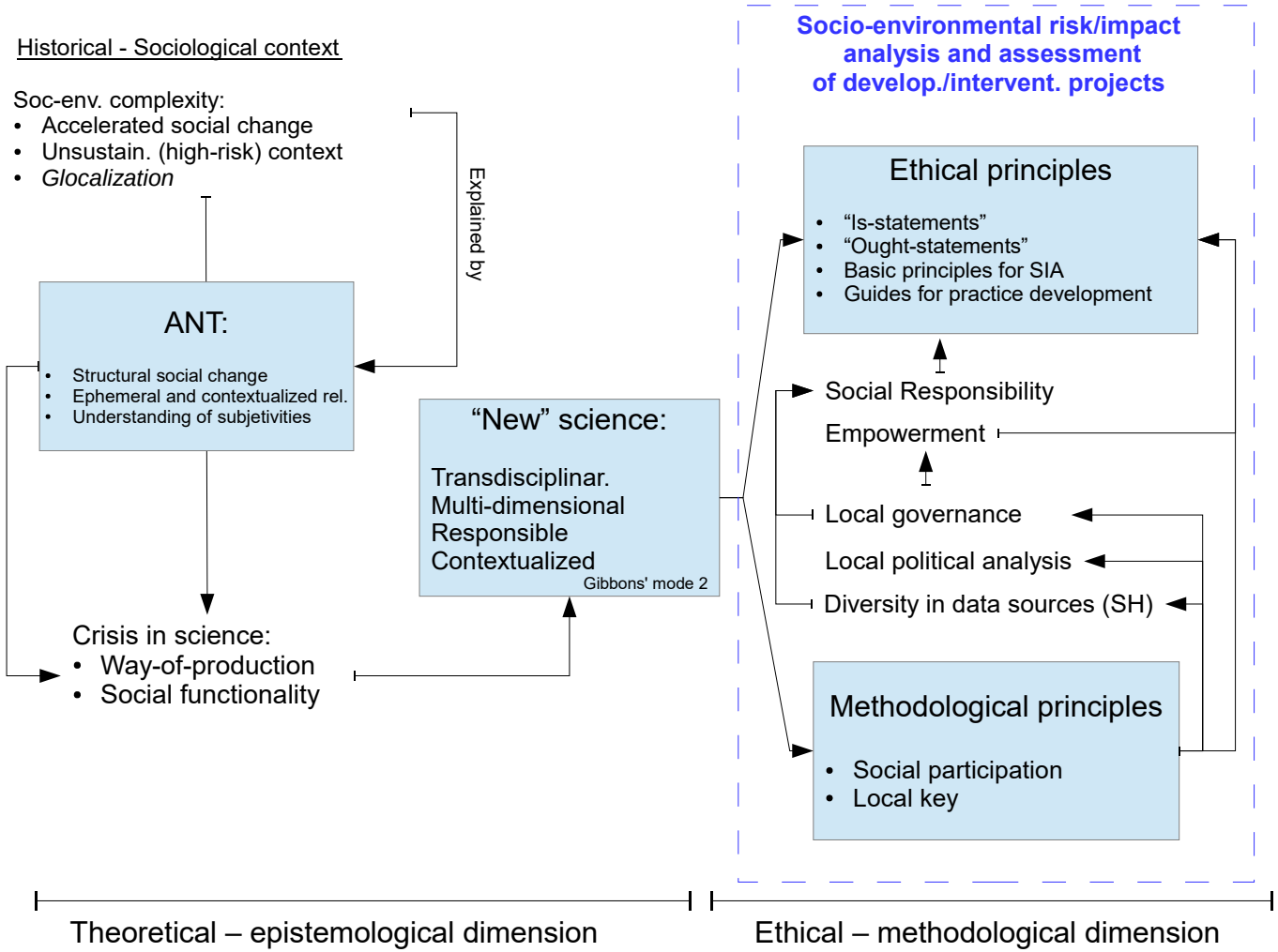
The work of Foucault (1980, 2000) and more recently Flybjerg (1998, 2012, 2014) provide the necessary frame for the crucial political analysis in SIA studies. As both experience and the literature show (Franks et al, 2009, 2014; Esteves et al., 2012), it can be assumed that the developers' exercise of power in the local area works according to an alien logic, imported from distinct social levels. This is a *paradigmatic* logic (Ávila, 2006), whose ethics are imposed on others and defended as unquestionable since they are shared by the dominant positions in the network, originating outside the local context in which they are imposed. Apart from this, in the

actual network of local relationships we often find other stakeholders who share this logic due to its *acceptance as the norm* in external fields or, directly, in global culture as a whole.

Thus is it normal for developers and political and/or administrative actors on the local, national or international scenes to argue in favour of a project in a specific territory. For example, an oil pipeline delivering petrol to the areas through which it passes can be promoted by the World Bank (which funds the investment) with the same arguments as the promoters (ExxonMobil, Petronas, Chevron) and the national political actors (the governments of Chad and Cameroon). A proper political analysis would have uncovered the presence of other particular positions in the local network of relationships, and the need to include them. As a consequence of this exercise of exogenous power the development will accumulate an ethical and scientific deficit, and therefore also a deficit in sustainability (Germond, 2014).

For this reason it is of compelling interest for the project to know what position each actor takes in the local network of relationships, what interest they have in the development, and to what extent they will be affected by it. SIA analysis should answer the questions of why these positions are taken up and what ethics, logics and discourses they correspond to; also, adopting a more dynamic approach, how the relationships between these positions "work" and how they will probably develop in response to the changes foreseen in the context (Duim, 2013). Although these questions appear to fulfil scientific-technical objectives (in the sense of improving the flow of information for the project's assessment), they also address ethical and political objectives; and answering them also serves to empower local actors and enhance governance in the project-affected area (Deller, 2010; Fung & Avers, 2003; Grabher, 2004).

Figure 1. Conceptual map: theoretical, epistemological, axiological and methodological aspects of socio-environmental integration in risk / impact studies of development projects.



Source: created by the authors.

Conclusions: the fundamental principles underlying SIA practice

The four conceptual bases put forward here can be grouped into two major dimensions. The first, theoretical-epistemological, provides SIA practice with key principles for analysis and understanding of the context and its dynamic; and this dimension also represents the basis for Mode 2 scientific action. The second, ethical-methodological, dimension defines principles for the design and implementation of SIA.

The theoretical-epistemological axis is defined in the first place by the principle of the complexity of local socio-environmental relationships. This phenomenon fits well with ANT, and can be observed, investigated, measured and understood using social science research techniques for each of its component parts: actors, relationships and contexts. The actors are seen as laden with a subjectivity which crystallizes in ethical and political standpoints; and in the SIA field they are conceptualized as stakeholders, in a certain way *recipients* "containing" perceptions, interpretations and discourses, and positioning themselves relatively and contextually within the network. That is, depending on the particular context where the development is carried out or to which it refers, the subjective "content" of these positions can vary, along with the relationships between them. The context, therefore, is decisive for the definition and analysis of the stakeholders and the relationships unfolding amongst them. This context is dynamic by definition and is made up of a wide range of factors (demographic, geographical, economic, cultural, biophysical, historical, ecological, etc.). In this model of socio-environmental reality, any change in any one of its components may generate chain reactions which, since they have methodological consequences for the SIA, must be taken into account.

Secondly, to this sociologically complex context there corresponds, in epistemological terms, an alternative – though no less rigorous – mode of producing knowledge: a mode of scientific production whose main objective is that it works, and is oriented towards solving problems. The social-relational context emerging from ANT demands highly flexible methods and techniques which can be adapted as closely as possible to the circumstances of the research, and are sensitive to the diversity and variability of the stakeholders involved. Multi- and transdisciplinarity, methodological triangulation, complementarity of quantitative and qualitative approaches, etc., are constantly repeated buzzwords in the scientific literature of the socio-environmental field, though less frequently put into practice. In SIA, these buzzwords become indispensable for a

contextualized and functioning scientific-technical practice. Mode 2 scientific production can therefore be defined as a new scientific ethic, embracing social responsibility and contextualized utility.

Thus the theoretical-epistemological dimension is intimately linked to the second, ethical-methodological dimension. In first place, the exercise of SIA requires some basic ethical principles, based on internationally and institutionally recognized and accepted values, and which also define an ethics of scientific-social practice for development projects. These basic principles have gradually taken form due to the accumulation of knowledge yielded by professional practice and academic research (Interorganizational, 1994; Burdge, 1994; 2004). Vanclay (2003; 2006) distinguishes between core values, principles and guidelines. *Core values* are defined as fundamental concepts in the design and carrying out of projects, and for the SIA professional community; these should sustain the theoretical, methodological and practical development of SIA research. These are the so-called "is-statements". Briefly, respect of and reference to basic human rights, living and working in healthy and high quality environments which enable people to develop their personal potential, the importance of social factors in the environment for the promotion of health and quality of life, the right to be included in the of decision-making processes affecting people's lives, and local experience and knowledge as key to enhancing projects. The fundamental *principles* for the design and carrying out of development projects, which have more the character of "ought-statements," are based on the above values. Some examples: the need for social equity in initiatives which can take into account those worst placed in society; giving respect and importance to the disparity of interests in play; the principles of transparency and accountability. Vanclay adds to these a list of twelve principles specific to the practice of SIA, such as the need to account for the majority of impacts, and that projects should be modified in order to maximize positive impacts (and reduce negative ones), along with the need to incorporate local knowledge into SIA. Lastly, *development guidelines* are defined as recommendations for action, which should therefore be specific to each type of stakeholder: practitioners, regulatory agencies, politicians and developers, affected people, NGOs, promoters, financial bodies and development agencies.

Finally, the methodological aspect of the second dimension can be formulated as a transversal principle: social participation. The presence of multiple stakeholders in the local context obliges us, both from the scientific and the ethical point of view, to consider their views as information, as data, feeding into the process of risk and impact assessment. As we have noted above, the design and implementation of the project usually results in the emergence of tensions in the power relationships

between the stakeholders affected. Even news or the public announcement of the start of studies for a possible development (for example geological soundings, opinion surveys or simply a press article) can bring to light the sensitivity of affected or interested stakeholders to changes in the status quo which may threaten their positions or interests. Especially when the study is an SIA of a large-scale development with a high level of impact in its construction or operational phase, it is common to find an "infected" political situation. In other words, in contexts where the relationships between stakeholders have been strongly marked by the appearance of a new actor whose position has been imposed on the rest, there is a certain *contamination* in ethical terms and in terms of the exercise of power or authority (politics). This is where social participation should be seen as the key approach, transversal to the whole SIA process. Embracing the various viewpoints of the stakeholders in play in the design of the project means, in scientific-methodological terms, increasing the sources of information and widening the assessment community, and thereby improving the reliability and validity of the SIA. It also means, on the ethical level, enhancing the development's social responsibility, in terms of its congruence with the values and principles mentioned above. Taking participation as methodologically fundamental involves, in the end, more profitable and sustainable development projects.

References

Albergaria, R., & Fidelis, T. (2006). Transboundary EIA: Iberian experiences. *Environmental Impact Assessment Review*, *26*(7), 614–632. doi:10.1016/j.eiar.2006.04.001

Andreu, H. G., Aledo, A., & Ortiz, G. (2010). Análisis de mapas causales de impactos del turismo residencial. *Empiria. Revista de Metodología de Ciencias Sociales*, *20*.

Ávila-Fuenmayor, F. (2006). El concepto de poder en Michel Foucault. Retrieved September 5, 2014, from http://www.redalyc.org/resumen.oa?id=99318557005

Baines, J., & Morgan, B. (2009). The challenge of integrated impact assessment: one set of guiding principles – many methods. *Australasian Journal of Environmental Management*, *16*(1), 6–15. doi:10.1080/14486563.2009.9725212

Baines, J. T., Taylor, C. N., & Vanclay, F. (2013). Social impact assessment and ethical research principles: ethical professional practice in impact assessment Part II. *Impact Assessment and Project Appraisal*, *31*(4), 254–260. http://doi.org/10.1080/14615517.2013.850306

Bartlett, R. V. (1993). Integrated impact assessment as environmental policy: the New Zealand experiment. *Policy Studies Review*, *12*(3-4), 162–177.

Bauman, Z. (2001). *La posmodernidad y sus descontentos* (Vol. 11). Madrid: Akal.

Bauman, Z. (2004). *Postmodern ethics*. Oxford: Blackwell.

Beck, U., Giddens, A., & Lash, S. (1997). *Modernización reflexiva: política, tradición y estética en el orden social moderno* (Vol. 879). Madrid: Alianza Editorial.

Beck, U., & Ritter, M. (1992). *Risk society: towards a new modernity*. London: Sage.

Bourdieu, P. (1988). Vive la crise. For heterodoxy in social science. *Theory and Society*, *17*(5), 773.

Burdge, R. J. (2004). *The concepts, process and methods of social impact assessment*. Middleton: Social Ecology Press.

Burdge, Rabel J. (1994). *A conceptual approach to social impact assessment: collection of writings by Rabel J. Burdge and colleagues*. Social Ecology Press Middleton, Wisconsin. Retrieved from http://www.getcited.org/pub/100064006

Canelas, L., Almansa, P., Merchan, M., & Cifuentes, P. (2005). Quality of environmental impact statements in Portugal and Spain. *Environmental Impact Assessment Review*, *25*(3), 217–225. doi:10.1016/j.eiar.2004.02.001

Cashmore, M. (2004). The role of science in environmental impact assessment: process and procedure versus purpose in the development of theory. *Environmental Impact Assessment Review*, *24*, 403–426.

Casti, J. L., & Karlqvist, A. (1996). *Boundaries and barriers: on the limits to scientific knowledge*. Addison-Wesley.

Cressman, D. (2009). CPROST » Blog Archive » A Brief Overview of Actor-Network Theory: Punctualization, Heterogeneous Engineering & Translation. Retrieved from http://www.sfu.ca/cprost/?p=272

Deller, S. (2010). Rural poverty, tourism and spatial heterogeneity. *Annals of Tourism Research*, *37*(1), 180–205. doi:10.1016/j.annals.2009.09.001

Domínguez-Gómez, J.A, & Relinque, F. (2014). Advising Efficient Political Decisions for Sustainability of Local Agricultural Systems: High-Risk Agriculture in Southern Europe. *Agroecology and Sustainable Food Systems*, *38*(7), 839–857. http://doi.org/10.1080/21683565.2014.902894

Dreyer, M., Renn, O., Cope, S., & Frewer, L. J. (2010). Including social impact assessment in food safety governance. *Food Control*, *21*(12), 1620–1628. doi:10.1016/j.foodcont.2009.05.007

Du Pisani, J. A., & Sandham, L. A. (2006). Assessing the performance of SIA in the EIA context: A case study of South Africa. *Environmental Impact Assessment Review*, *26*(8), 707–724. doi:10.1016/j.eiar.2006.07.002

Duim, R. van der, Ren, C., & Jóhannesson, G. T. (2013). Ordering, materiality, and multiplicity: Enacting Actor–Network Theory in tourism. *Tourist Studies*, *13*(1), 3–20. doi: 10.1177/1468797613476397

Durkheim, E. (1973). *Les règles de la méthode sociologique* (18th ed.). Paris: Presses Universitaires de France.

Esteves, A. M., Franks, D. & Vanclay, F. (2012). Social impact assessment: The state of the art. *Impact Assessment & Project Appraisal*, *30*(1), 35–44.

Featherstone, M., Lash, S., & Robertson, R. (1995). *Global Modernities*. SAGE.

Flybjerg, B. (1998). *Rationality and Power: Democracy in Practice*. (S. Sampson, Trans.) (First Edition.). Chicago: University of Chicago Press.

Flybjerg, B. (2012). *Real Social Science: Applied Phronesis.* Cambridge University Press. Retrieved from http://www.cambridge.org/us/academic/subjects/sociology/research-methods-sociology-and-criminology/real-social-science-applied-phronesis

Flybjerg, B. (2014). Projects, Power, and Politics: A Conversation with Bent Flyvbjerg. *Projects, Power, and Politics: A Conversation with Bent Flybjerg-Interview Conducted by Jesper Pagh and Malene Freudendal-Pedersen Twentyfirst*, (3), 62–75.

Foucault, M. (2000). *Power* (Translated by Robert Hurley.). New Press.

Foucault, M. (1980). *Power/ Knowledge.* Edited by Colin Gordon. Harvester.

Franks, D., Fidler, C., Brereton, D., Vanclay, F., & Clark, P. (2009). *Leading Practice Strategies for Addressing the Social Impacts of Resource Developments*. Brisbane: Centre for Social Responsibility in Mining. The University of Queensland. Briefing paper for the Department of Employment, Economic Development and Innovation, Queensland Government.

Franks, D. M., Davis, R., Bebbington, A. J., Ali, S. H., Kemp, D., & Scurrah, M. (2014). Conflict translates environmental and social risk into business costs. *Proceedings of the National Academy of Sciences*, *111*(21), 7576–7581. doi:10.1073/pnas.1405135111

Fung, A., & Abers, R. (2003). *Deepening Democracy: Institutional Innovations in Empowered Participatory Governance*. Verso.

Funtowicz, S. O. (2000). *La Ciencia posnormal : la ciencia con la gente*. Barcelona: Icaria.

Funtowicz, S. O., & Ravetz, J. R. (1992). Three types of risk assessment and the emergence of Post-Normal Science. In S. Krimsky & D. Golding (Eds.), (pp. 251–273). Westport: Praeger.

Funtowicz, S. O., & Ravetz, J. R. (1993). Science for the post-normal age. *Futures*, (September), 739.

Germond-Duret, C. (2014). Extractive Industries and the Social Dimension of Sustainable Development: Reflection on the Chad–Cameroon Pipeline. *Sustainable Development*, *22*(4), 231–242. doi:10.1002/sd.1527

Gibbons, M. (1994). *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. SAGE.

Giddens, A. (1998). *Modernidad e identidad del yo :el yo y la sociedad en la época contemporánea* (2ª ed., Vol. 257). Barcelona: Península.

Giddens, A. (2002). *Consecuencias de la modernidad* (Vol. 100). Madrid: Alianza Editorial.

Gill, D. A., Picou, J. S., & Ritchie, L. A. (2012). The Exxon Valdez and BP Oil Spills A Comparison of Initial Social and Psychological Impacts. *American Behavioral Scientist*, *56*(1), 3–23. http://doi.org/10.1177/0002764211408585

Grabher, G. (2004). Temporary Architectures of Learning: Knowledge Governance in Project Ecologies. *Organization Studies*, *25*(9), 1491–1514. doi:10.1177/0170840604047996

Kapelus, P. (2002). Mining, Corporate Social Responsibility and the "Community": The Case of Rio Tinto, Richards Bay Minerals and the Mbonambi. *Journal of Business Ethics*, *39*(3), 275–296. http://doi.org/10.1023/A:1016570929359

Krishna, V. V. (2014). Changing Social Relations between Science and Society: Contemporary Challenges. *Science Technology & Society*, *19*(2), 133–159. doi:10.1177/0971721814529876

Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press. Retrieved from dialnet.unirioja.es/descarga/articulo/1382307.pd

Latour, B. (1996). On actor-network theory: A few clarifications. *Soziale Welt*, *47*(4), 369–381.

Lozares, C. (1996). La teoría de redes sociales. *Papers*, *48*, 103–126.

Luckmann, T. (2013). The communicative construction of reality and sequential analysis. A personal reminiscence. *Qualitative Sociology Review*, *9*(2), 40–46.

Macklin, S, & Hartog, J. (2004). An Integrated Approach to Impact Assessment. *International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production*, 55–60.

Mahmoudi et al. (2013). A framework for combining Social Impact Assessment and Risk Assessment. *Environmental Impact Assessment Review* 43, 1-8. http://dx.doi.org/10.1016/j.eiar.2013.05.003

Meagher, G., & Wilson, S. (2002). Complexity and practical knowledge in the social sciences: A comment on Stehr and Grundmann. *British Journal of Sociology*, *53*(4), 659–666. doi:10.1080/0007131022000021533

Murdoch, J. (1998). The spaces of actor-network theory. *Geoforum*, *29*(4), 357–374.

Murdoch, J. (2001). Ecologising sociology: Actor-network theory, co-construction and the problem of human exemptionalism. *Sociology*, *35*(1), 111–133.

Pestrel, C. (2006). Reseñas. Bruno Latour. Reassembling the social. Oxford, University Press. 2005. *Política y Sociedad*, *43*(3), 127–130.

Prout, A. (1996). Actor-network theory, technology and medical sociology: An illustrative analysis of the metered dose inhaler. *Sociology of Health and Illness*, *18*(2), 198–219.

Rowan, M., & Streather, T. (2011). Converting project risks to development opportunities through SIA enhancement measures: a practitioner perspective. *Impact Assessment and Project Appraisal*, *29*(3), 217–230. doi:10.3152/146155111X12959673796164

Slootweg, R., Vanclay, F., & Schooten, M. v an. (2001). Function evaluation as a framework for the integration of social and environmental impact assessment. *Impact Assessment and Project Appraisal*, *19*(1), 19–28.

Smith, S. L., Pollnac, R. B., Colburn, L. L., & Olson, J. (2011). Classification of coastal communities reporting commercial fish landings in the U.S. Northeast region: Developing and testing a methodology. *Marine Fisheries Review*, *73*(2), 41–61.

Stehr, N., & Grundmann, R. (2001). The authority of complexity. *The British Journal of Sociology*, *52*(2), 313–329. doi:10.1080/00071310120045006

Stewart, P. (2001). Complexity Theories, Social Theory, and the Question of Social Complexity. *Philosophy of the Social Sciences*, *31*(3), 323–360.

Tajziehchi, S. (2011). Problems and challenges facing developing countries in order to execute the social impact assessment of dams-a review. *European Journal of Scientific Research*, *56*(4), 489–495.

The Interorganizational Committee on. (1994). Guidelines and Principles For Social Impact Assessment. U.S. Dept. of Commerce. Retrieved from http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm

Tirado, F., & Doménech, M. (2005). Asociaciones heterogéneas y actantes: el giro postsocial de la Teoría del Actor-Red. *Revista de Antropología Iberoamericana*, *Nov-Dic.*

Torriti, J. (2011). The unsustainable rationality of Impact Assessment. *European Journal of Law and Economics*, *31*(3), 307–320. doi:10.1007/s10657-010-9202-y

Vanclay, F. (2003). International principles for social impact assessment. *Impact Assessment and Project Appraisal*, *21*(1), 5–11.

Vanclay, F. (2006). Conceptual and methodological advances in social impact assessment. In H. Becker & F. Vanclay (Eds.), (p. 1). Cheltenham: Edward Elgar Publishing.

Vanclay, F., Baines, J. T., & Taylor, C. N. (2013). Principles for ethical research involving humans: ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal*, *31*(4), 243–253. http://doi.org/10.1080/14615517.2013.850307

Vanclay, F; Esteves, A.M.; Aucamp, I.; Franks, D. (2015). Social impact assessment: guidance for assessing and managing the social impacts of projects. International Association for Impact Assessment.

Vesuri, H., Guedon, J-C., & Cetto, A.M. (2014). Excellence or quality? Impact of the current competition regime on science and scientific publishing in Latin America and its implications for development. *Current Sociology*, *62*(5), 647–665.

Voyer, M., Gladstone, W., & Goodall, H. (2012). Methods of social assessment in Marine Protected Area planning: Is public participation enough? *Marine Policy*, *36*(2), 432–439. doi:10.1016/j.marpol.2011.08.002

Wasserman, S., & Galaskiewicz, J. (1993). Special issue on "Advances in Sociology from Social Network Analysis." *Sociological Methods & Research*, *22*(1).