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Social metabolism, ecologically unequal exchange and resource extraction conflicts in Latin America. Analytical Framework and Case Studies

Analytical Framework Report

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Summary & Key Words

In our research we aim to study the social metabolism of Latin American economies, particularly in the primary export sectors, with appropriate methods such as Material Flow Analysis. Such analysis has not been conducted by CEPAL or UNEP or the WB yet. Long data series going back to 1970 are available for Ecuador, Colombia, Argentina and other countries. They show an increasing weight of the extractive industries (including some forms of biomass), large physical trade deficits, and a declining trend in terms of trade (except for recent years).

Our research plan aims to analyse two closely related processes. Firstly, from a social metabolism perspective (that comes from ecological economics and industrial ecology studies) we will analyse national material extraction trends of some Latin American countries and their relation with the emergence of national and regional resource extraction conflicts. Secondly, in order to expand our insight of these resource extraction conflicts, their main actors, demands, languages of valuation, strategies and impacts, we will conduct some in-depth and comparative case studies. From an anthropological, sociological and political sciences perspective we will analyse emerging movements that are challenging extractivist models, building environmental justice movements, fostering a “paradigm shift” not only in resource use but in the economic and social objectives. In this line, attention will be given to the “Buen Vivir” (Sumaq Kawsay in Quechua), a concept inspired in Andean indigenous movements, but also in the critiques of uniform development as an objective, by Arturo Escobar and other authors. These movements are challenging public debates on wellbeing and development in Latin America in parallel to debates in Europe on “prosperity without growth” (Jackson, 2009) or “socially sustainable economic degrowth” (Schneider et al, 2010, Martinez-Alier et al, 2010). Moreover, we shall also analyse debates on the procedures for decision-making for extractive projects, looking at the use of CBAs and EIAs, emphasizing the need to address value incommensurability and local participation through social multicriteria methods (Munda 2008).

Key Words: social metabolism, ecological distributive conflicts, ecological unequal exchange, extractive activities, Material Flow analysis, Buen Vivir, social multicriteria methods.

Analytical Framework

The conflicts dimension of environmental governance is usually centered on social and political aspects. It has rarely taken into account the characteristics of the natural resources themselves. In order to include these elements, this research brings together ecological economics and political ecological (M'Gonigle, 1999; Martinez-Alier et al. 2010; Gerber et al., 2009). It sheds light on renewable (e.g. timber) and non-renewable (e.g. gold) resource extraction conflicts in the context of a changing global social metabolism and increasing demands for environmental justice.

By “social metabolism” we refer to the manner in which human societies organize their growing exchanges of energy and materials with the environment (Fischer-Kowalski, 1997; Martinez-Alier, 2009). A socio-metabolic perspective is adopted which requires considering not only the extractive industries—mining for metals and building materials or extraction of fossil fuels (Canel et al., 2010)—but also biomass extraction conflicts (tree plantations, e.g. Gerber, 2011, agro-fuels and other export crops, deforestation and mangrove destruction, and fisheries). Methodological tools and theoretical frameworks from the cross-disciplinary fields of ecological economics, industrial ecology, environmental sociology, ethno-ecology, social ecology, economic geography and political ecology are mobilized to analyse socio-ecological dynamics and environmental conflicts.

As we present the main elements of our analytical framework, the research needs we aim to address will be pointed out. In a second section more details on the case studies will be provided.

Social Metabolism: A Biophysical Approach to the Economy

In recent years a consensus seems to have grown that regards sustainability as a problem of the interaction between society and nature (Fischer-Kowalski and Haberl et al. 2007). The precise nature of this interaction is biophysical: It is the continuous throughput of materials and energy on which each socio-economic system depends and which constitutes its relation to the natural environment. Such an understanding of society as a socially organized and thermodynamically open system has been termed *social* (Fischer-Kowalski and Haberl 1993)

or *industrial metabolism*.

The application of the biological concept of metabolism (Stoffwechsel) to social systems can be traced back to Marx who, influenced by Liebig and Moleschott, talks about the —metabolism between man and nature as mediated by the labour process. Such a biophysical approach to the economy was not unusual at the turn of the 19th century but arguably did not form an integrated school of thought until recently (see Martinez-Alier 1987; Fischer-Kowalski 2002). This biological analogy grew from the observation that biological systems (organisms, but also higher level systems such as ecosystems) and socio-economic systems (human societies, economies, companies, households etc.) decisively depend on a continuous throughput of energy and materials in order to maintain their internal structure (Fischer-Kowalski and Haberl 1993).

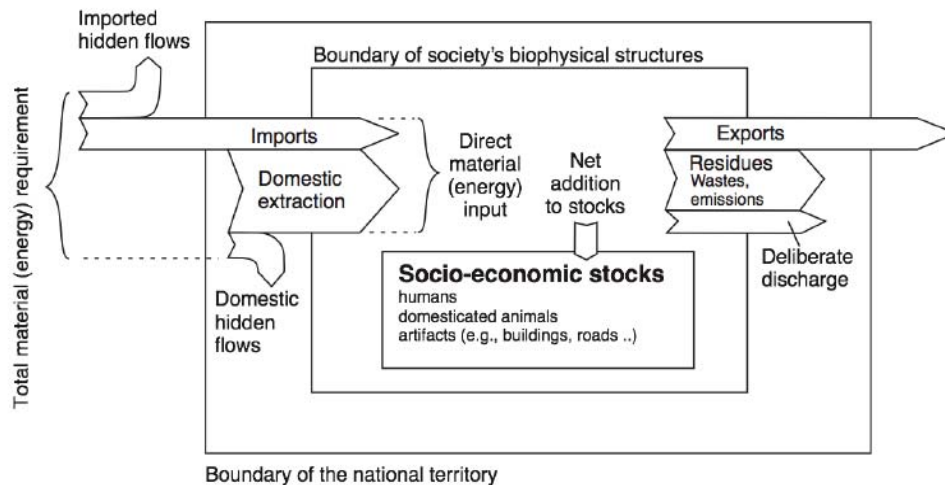
The social metabolism concept links material and energy flows to social organization, recognizing that the quantity of economic resource use, the material composition and the sources and sinks of the output flows are historically variable as a function of the socio-economic production and consumption system. When speaking of metabolism however, one must have adequate knowledge of the system that has to be reproduced. Only then is it possible to assess the material and energetic flows required for the maintenance of the system in question. Most likely the system is a society at a specific level of scale and might be described as an organized set comprising a cultural (symbolic) system and those material elements accorded preferential treatment by the cultural system (human population and material artefacts) (Fischer-Kowalski and Weisz 1999). The flows are accounted where society appropriates or releases materials from or to nature.

Today, *social or industrial metabolism*, along with standardized methods to account for its energy flow, material flow, and land use aspects, provides the basis for empirical analyses of the biophysical structure of economies and for developing strategies towards more sustainable production and consumption patterns. A number of operational tools have been developed to analyze the biophysical aspects of social metabolism, its associated driving forces and environmental pressures (Haas et al. 2005). Examples include material and energy flow analysis (MFA), input-output analysis (IOA) and life cycle analysis (LCA), but other instruments in the social metabolic toolkit include HANPP (Human Appropriation of Net Primary Production), EROI (Energy Return on Energy Investment), and Virtual Water, as well as related concepts such as ecological footprinting and ecological rucksacks.

Material Flow Analysis

The Economy-wide Material Flow Analysis (MFA), is “a consistent compilation of the overall material inputs into national economies, the material accumulation within the economic system and the material outputs to other economies or to the environment” (EUROSTAT, 2001, p.17). The MFA approach complements the system of national accounts, with a compatible system of biophysical national accounts using *tonnes* per year as the key unit of measurement. Such methodology provides a picture of the physical dimension of the economy, where the total turnover of energy and materials of the socio-economic system can be analysed historically or cross-section through the accounts of inputs flows (biomass, fossil fuels, construction minerals, etc.) or output flows (exports, waste, pollutant emissions) (Figure 1). Focusing on the input side by taking into account all materials that enter into the national economy allows acknowledging the physical dimension of foreign trade and can determine the amount of all outputs transferred to the environment (Gonzalez-Martinez and Schandl, 2008).

Figure 1: Society’s material (and energy flows) within the M(E)FA framework



Source: Haberl et al 2004

MFA studies have been conducted in most OCDE countries (Bringezu et. al., 2008), also on India (Singh et al, 2011, in press) and only recently research has been conducted in Latin-American countries for long periods of time, as for Chile, Peru, Mexico, Ecuador, Colombia and Brazil (Giljum, 2004; Eisenmenger et. al., 2007, Russi et. al. 2008; Gonzalez-Martinez and Schandl, 2008; Muñoz et al, 2009, Vallejo, 2010; Vallejo et. al., 2011; Muñoz Jaramillo, 2012). These analyses are providing relevant information to define the metabolic pattern of such economies at the periphery of the global economy and to understand the socio-ecological consequences of their trade patterns.

There has been some research on material flow analyses in Latin American (LA) countries. However, there is further need to a) update and expand the elaboration of MFA studies on LA countries going back 40 or 50 years; b) explore the links between these metabolic profiles and increasing local and national environmental conflicts; and c) discuss the potential and limitations of MEFA to predict and understand the occurrence of environmental conflicts. (Case study package 1)

Ecologically Unequal Exchange

A comprehensive analysis of the metabolic profile of a society and its local pressures and impacts requires some political ecology considerations. One starting premise of this WP is the understanding that economic change generally tends to occur for the benefit of some groups and at the expense of others (existing or future) (Hornborg, 2009). Externalities may be understood as market failures but they may also be seen as cost-shifting successes (Kapp, 1950, Gerber and Steppacher, 2011).

The optimistic views regarding ecological modernization, “dematerialization” of the economy, and the downward slopes in the Kuznets environmental curves (Stern, 2004) are confronted with the reality of increased inputs of energy and materials into the world economy, and increasing production of waste. It has long been mistakenly argued that developed nations are dematerializing their economies, that is, that citizens of these countries value more and more consumption of services over material products and therefore they use less materials per unit of GDP or even in absolute terms. In other words as an economy grows its environmental pressure is expected to decrease. However, research shows that such improvement have occurred only with regard to some specific

pollutants (e.g. air pollutants such as SO₃). Other indicators of environmental pressures show inconsistent trends or, on the contrary, indicate that pollution levels tend to increase in affluent societies (e.g. greenhouse gas production, waste generation) (Roca et al. 2001, Stern 2004).

A related claim made by World Bank and World Trade Organization analysts states that exports from developing nations fosters economic growth and development. These arguments however have been questioned by ecologically unequal exchange studies (Bunker, 2007, Hornborg, 1998, Muradian and Martinez-Alier, 2001). Ecologically unequal exchange research highlights how poor countries are exporting goods at prices which do not take into account local externalities or depletion of natural resources, in exchange for the purchase of expensive goods and services from richer regions. Their empirical findings suggest that trade relations remain strongly unbalanced and unfair because many poorer nations (and regions) export large quantities of under-priced goods whose value does not take into account the environmental and social costs of extraction, processing, or shipping. Moreover, the metropolitan regions or countries require for their metabolism increasing amounts of energy and materials at cheap prices.

Indeed, the economy of rich countries or regions (including parts of China) is so dependent from inputs of energy and materials that, even without economic growth, the pressure on the “commodity frontiers” (Moore, 2000) where these inputs are extracted from, is bound to grow. We know that energy cannot be recycled, and materials are recycled only to some extent. Resources essential to the metabolism of importing countries or regions (such as oil, gas, coal or some minerals and forms of biomass) are typically extracted at a heavy social and environmental cost. At other times, the materials extracted are luxury goods (diamonds, gold, mahogany, ivory or shrimp: “preciosities”, as Wallerstein (1974) called them) that are important for the social relations and commercial economies of the importing countries though rather superfluous directly to their metabolism, while the production of which can cause havoc in the exporting territories.

All goods circulate through “commodity chains” (Raikes et al, 2000), i.e. from cradle to grave or from point of extraction to waste disposal. Ecological distribution conflicts occur at different stages of these chains (extraction, transport, processing and final disposal) as peasant or tribal groups, national or multinational companies, national governments, local or international environmental justice organizations, consumer groups, have stakes at different points of the chain (Martinez Alier et al, 2010).

Ecological distributive conflicts

We consider the scale of social metabolism as one of the main driving forces of ecological distribution conflicts (Martinez Alier et al. 2010). As more resources are demanded, extraction pressures increase and environmental pressures grow at all the stages of the commodity chain increasing environmental and social risks (oil spills, water pollution, landfill leakages...). However, between the material and energy flows in the economy and the actual occurrence of conflicts there is a large variety of variables involved. Social-environmental conflicts are typically complex in the way they emerge and are configured. They usually encompass different layers and networks of social actors (Bebbington et al., 2008, Bury, 2005). Due to this complexity, generalizations about why do they arise and how they evolve are hard to achieve. Conflicts are determined by the way the territory is used and appropriated by actors, by population density, by the scarcity of water, the characteristics of the commodities in question and the technologies of exploration or exploitation, as well as by the formal and informal institutions in place (Muradian et al. 2003, Perreault, 2006, Svampa and Antonelli, 2009, Walter and Martinez-Alier, 2010). An open-pit mine in a heavily populated area whose indigenous dwellers depend on irrigated agriculture as the main source of livelihood, has a higher probability to trigger a conflict than an underground mine far away from populated areas (Urkidi and Walter, 2011). Local perceptions about risks, historical traditions as well as the prevailing notions of identity and fairness constitute another level of causality. When there is a clash between the perception of risk by technicians and other social groups, conflicts are more likely (Muradian et al., 2003). As well, in case of forced displacement and a skewed distribution of benefits, the probability of open confrontations is lower depending on the degree of authoritarianism of the state and fear in the population. We can expect these variables to vary greatly between world regions, and even among regions within a national territory.

Studies on extractive conflicts have addressed a diversity of issues, which include the institutional frameworks (decision-making processes, participatory inclusions and exclusions, and regulatory schemes) and territorial transformations fostered by anti-mining movements, their strategies and demands, the constructions of narratives across scales and the valuation languages deployed (Bebbington et al., 2008, Bury, 2005, De Echave et al., 2009, Haarstad and Floysand, 2007, Muradian et al. 2003, Orta et al. 2008, Perreault, 2006, Svampa and Antonelli, 2009). A new field of research is emerging regarding the arrival of new actors in

the LA extraction scene, both as trade partner and as investor. Especially the large Chinese demand for the region's commodities and the rapid entry of Chinese investors and creditors are attracting the attention, but also Indian companies have started to invest in this sector. In this line, we aim to review effects on natural resource use and environmental conflicts of the new direct investments by new corporate actors in resource extraction in the region **(case study package 2)**.

Moreover, during the last decades extractive conflicts (i.e. ores, oil, gas, industrial agriculture, timber, mangroves) have fostered the formation of national and regional movements environmental justice (EJ) networks in Latin America (Acselrad, 2008, Carruthers, 2008, Urkidi and Walter, 2011). Oilwatch was founded in 1995, the WRM movement (based in Uruguay) in 1986, there have been networks of environmental justice organization against mines and against the loss of mangroves for many years, on a continental scales. As pointed by Urkidi and Walter (2011), these movements have sometimes managed to stop extractive projects, shaping a national debate on the activity and its impacts. These LA EJ movements have been poorly studied, further research is needed regarding how EJ dimensions and demands are framed and articulated in Latin American extractive conflicts (Carruthers, 2008). Among other novel and relevant ongoing processes which are reshaping the extraction debate in LA is the consolidation and institutionalization of the Buen Vivir in Andean countries. Buen Vivir are the Spanish words used in Latin America to describe alternatives to development focused on the "good life" in a broad sense. The term (as also Sumaq Kawsay) is actively used by social movements, and it has become a popular term in some government programs, reaching its way into two new Constitutions in Ecuador and Bolivia (Gudynas, 2011) **(case study package 2)**.

Concepts of Political Ecology, a field developed by geographers (Blaikie and Brookfield, 1987), anthropology and environmental sociology will aid us in this research effort. Political Ecology has a long tradition in the study of studies ecological distribution conflicts, defined as the struggles over the burdens of pollution or over the sacrifices made to extract resources and arising from inequalities of income and power (Martinez-Alier and O'Connor, 1996, Douguet et al, 2008, Roman, 2009).

Decision making procedures

Political Ecology also points to power as a key dimension in environmental conflicts,

exploring, for instance who has the power to impose decisions on resource extraction, land use, pollution levels, biodiversity loss, and more importantly, who has the power to determine the procedures to impose such decisions (Martinez-Alier, 2001, 2002, Robbins, 2004). In the past two decades the journal *Ecología Política* has been an academic platform for Spanish publications on political ecology, including many case-studies on Latin American and the Caribbean (*Ecología Política* has been edited by Martinez-Alier in Barcelona since 1990).

Indeed, decision making procedures are key elements to understand ecological distributive conflicts and the institutional settings behind these processes (Muradian et al, 2003; Walter and Martinez Alier, 2010, Urkidi and Walter, 2011). As Garmendia et al (2010) assert, traditional top-down and technocratic approaches seem to be insufficient to tackle the many conflicts related to the sustainable use of natural resources. At the same time, reductionist and mono-disciplinary approaches lack the capacity to capture the complex interactions within evolving socio-ecological systems. Indeed, hard engineering solutions and command and control approaches, which neglected the diversity of social actors and the multiple scales of complex socio-ecological issues, have been shown to be insufficient for solving many contemporary environmental conflicts. In Peru violent conflicts, as in Bagua in 2009, and use of the military as in Cajamarca in 2011, exclude deliberative democracy. Application of public consultations (under Convention 169 or outside) encounters many difficulties. There are parallels in other countries.

Since the 1990s, Latin American countries have included and expanded participation and environmental regulations through compulsory Environmental Impact Assessments. The adoption of participation criteria for project approval has fostered the interest and involvement of affected groups in decision-making processes. However, in many mining conflicts, participatory procedures have often proven insufficient or inadequate and have led to disputes about the decision-making processes (Muradian et al., 2003, Suryanata and Umemoto, 2005, Walter and Martinez-Alier, 2010). Mining, for instance, is often perceived by rural communities as incompatible with a livelihood based on agriculture (Haarstad and Floysand 2007, Muradian et al. 2003, Urkidi, 2010). Anti-mining groups frequently argue that the approval of mining projects implies the misrecognition of their material and cultural dependence on agriculture and local water sources. Bebbington et al. (2008) and Bury (2008) highlight the territorial and institutional changes related to mining activities (e.g. changes on land distribution and prices, social relations, livelihoods, local organizations); issues that are usually minimized in the official decision making. Baker and McLelland (2003) suggest that

mining decisions fail to take into consideration the values and beliefs of indigenous communities. As claimed by Arnstein (1969) different levels of participation are related to different degrees of recognition.

Hence, research on environmental conflicts has pointed to the limitation of current decision-making procedures (EIA, and current participation approaches) to address complex resource management decisions. In particular, these approaches have proven unable to articulate incommensurable values at stake in decisions (e.g. sacredness, landscape values, cultural values). In such contexts, Social Multi-Criteria Evaluation (Munda, 2008) has been proposed as a methodological and mathematical tool able to operationalize the concept of incommensurability of values (or weak comparability of values) at both macro and micro levels of analysis (Martinez-Alier et al. 1998). This approach allows to simplify and structure complex decision-making problems that can involve many stakeholders, a diversity of possible outcomes and many, sometimes intangible criteria by which to assess the outcomes. It aims to show the multi-dimensionality of the valuation languages used by different actors in such conflicts, from the economic language of compensation of externalities to livelihood needs, indigenous territorial rights and sacredness.

There is a recent Multicriteria Evaluation of the Yasuni ITT proposal in Ecuador but very few, if any, Social Multicriteria Evaluation on an ore mining conflict. We aim to conduct an experimental application in an ongoing mining conflict. This case study will both produce scientifically novel insights and become a useful tool for a local community currently analysing the consequences of allowing the entrance of mining activities in their territory in northern Ecuador. (Case study package 3)

Global transformations

Finally, we would like to point that we are currently experiencing global transformations that constitute the beginning of a new historical phase of modern capitalism (Muradian et al. in press). This phenomenon has significant socio-economic and environmental implications for countries rich in natural resources, particularly in Africa and Latin America. At the basis on such transformations is the recent economic emergence of China (Fernández Jilberto and Hogenboom, 2010) and the hegemonic transition (*sensu* Arrighi) that this entails. The transition encompasses not only a shift in the geographical location of the economic cores of global capitalism, but also a major shift in the metabolism of the world economy and

substantial changes in the global systems for the extraction and provision of natural resources. This has to do with the scale, the geography of extraction and consumption of resources, the dynamics of biophysical flows and the actors involved in the exploitation of both renewable and non-renewable resources at the global level (Roldan et al, in press). The in-depth study of this process exceeds the scope of this research but cannot be ignored by it.

Some initial results of this research line will possibly be published during 2012 in a special section in *Global Environmental Change*. The introductory paper, written by Roldan Muradian, Mariana Walter and Joan Martinez-Alier, elaborates on the relationship between major current global transformation and geopolitical changes (hegemonic transitions, focusing on China's role in Latin America), changes in the social metabolism of the global economy and the dynamics of socio-environmental conflicts. The paper aims to develop conceptual linkages between different streams of literatures and theoretical backgrounds as well as with various scales. A qualitative transformation in the drivers of economic growth and consumption of natural resources at the global level seems to be taking place. We discuss the socio-environmental and economic implications of such trends, particularly in Africa and Latin America.

Case studies

Case study package 1:

This case study package addresses the following research questions:

Which are the material extraction trends in LA countries? And which are the relations between LA countries extraction trends and environmental tensions and conflicts taking place in the region.

By means of Material Flow Analysis we aim to add to the body of studies that already exist on the material profile of some Latin American economies. We take long historical periods. We have started with the case of Argentina (submitted to the journal of industrial ecology) and we also aim to update the Material Flow Analysis of Ecuador, Colombia and Peru to 2010, studying their metabolic profiles and the trends in the environmental conflicts so

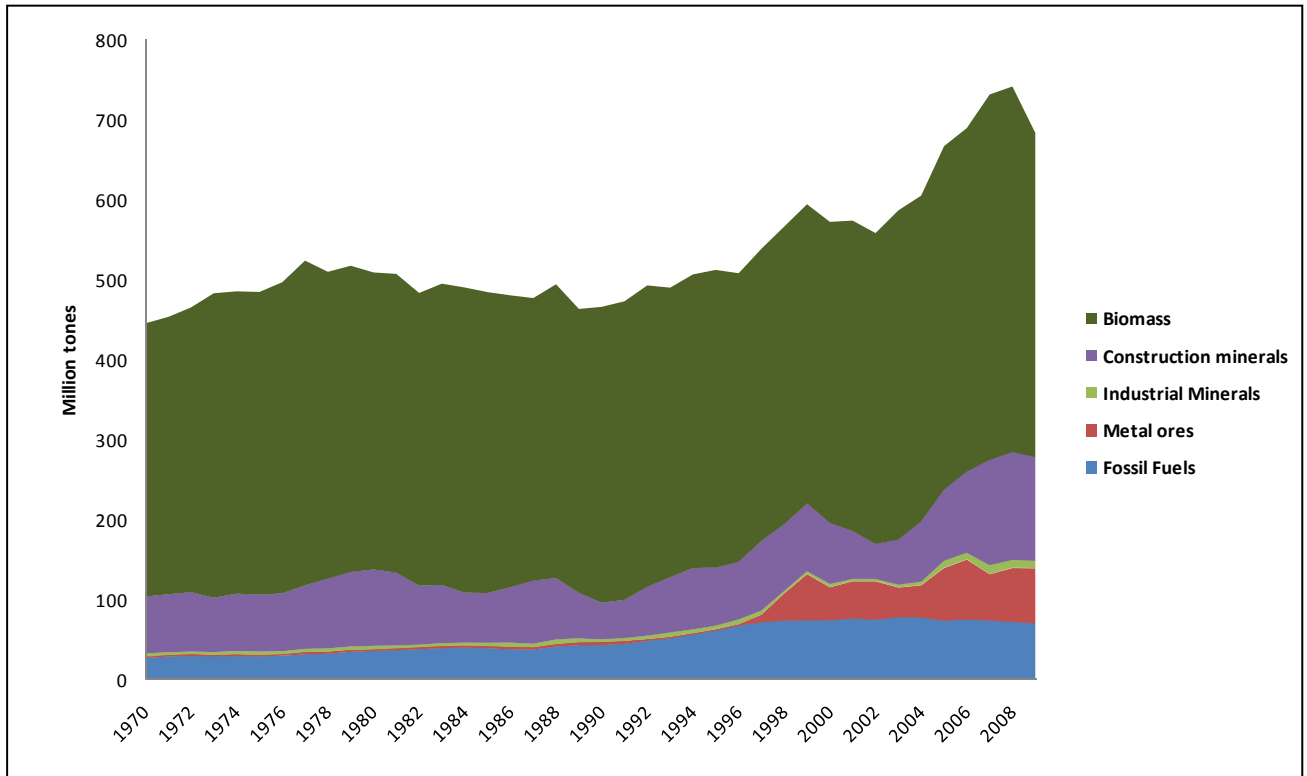
conspicuous in all three countries. Moreover, thematic and regional conflict databases and maps (e.g. extractive conflicts in Argentina and Ecuador) will be built and analysed in relation to the social metabolism trends.

Currently, we are finalizing the estimation of the Economy-wide MFA of Argentina for the period 1970-2009 using the standard method from EUROSTAT (2001). We are also conducting a mapping of resource extraction conflicts in Argentina, following the typology of Gerber (2011) for tree plantation conflicts.

Figure 2 presents some of the preliminary results of ICTA-UAB research on Argentina. We have estimated the Domestic Extraction (DE) by material flow. Biomass DE represents the most predominant activity (72% of DE), composed of fodder and grazing, other biomass and agricultural crops. On the latter is adequate to mention the importance of soybeans crops, it represent 17% of all agricultural crops by weight between 1970-2009 and 21% of all agricultural crops between 1996-2009 being the main export product. Biomass from primary crops increased consistently from 50 million tons in 1970, to 137 million tons in 2009. According to Pengue (2001), permanent crops for exports displace crops for domestic consumption. This is the case of soybeans whose production passed from 26 000 tons in 1970, to 30.9 million tons in 2009. This growth was driven on the one hand by high international prices of this commodity from the 1990s onwards (because of increased demand) and on the other hand, by higher mechanization of agricultural sector and the introduction of transgenic soybeans (and therefore chemical weeding with glyphosate) (Teubal, 2006). This rise was accompanied by an increase of land occupied and deforestation (Binimelis et. al., 2009). Harvested area of this crop passed from 38 000 Ha in 1970 to 18 million Ha in 2009, being more than half of the harvested area used for all grain production (MAGyP, 2011), evidencing problems like detriment of food security, the increasing use of agrochemicals generating water, air and soil pollution; weed resistance, and health impacts on the surrounding populations (Binimelis et. al., 2009).

Even though it shows only a moderate pattern of growth, livestock units and land occupied for raising cattle is the most predominant biomass flow in terms of grazing (74% Biomass share). This is because the number of cattle heads reported is an average of 53.4 million, showing the importance of the livestock industry.

Figure 2: Domestic extraction of Argentina (1970-2009)



Source: own estimations (unpublished), not to be quoted or reproduced

In this vein, analyses can be conducted on the different trends and socio-environmental related-pressures of these material flows (e.g. ore mining, construction materials). Fig. 2 shows already the rapid growing of extraction of mineral ores for export in the last few. We can also calculate the Physical Trade Balance of Argentina, and the changing terms of trade, contributing to the debates on “ecologically unequal trade”.

Case study package 2:

This case study package addresses the following research questions:

Which are the movements, discourses and emerging proposals contesting extractive policies? And how are these movements, discourses and proposals challenging and reframing the extractivism debate at the national and regional scale?

- What are the new trends, actors and initiatives in Latin America's extractivist sector? And how do they affect environmental conflict trends?

Different case studies will be conducted on different renewable and non-renewable resources. Moreover, we will analyze some novel processes such as the emergence of LA extractive environmental justice movements and the Buen Vivir proposals deployed in different LA countries. Here we present some of the case studies that will be conducted.

- **Anti-mining Environmental Justice Movements in LA.** We aim to study the connections between Latin American anti-mining movements and the environmental justice framework. Our approach addresses two research needs. Firstly, it improves our understanding of how the EJ discursive framework travels (from its origins in the USA in the 1980s, Bullard 1990), and is framed by activists in Latin America. Secondly, although research has pointed to the plurality of the environmental justice movement –EJM- discursive framework (Benford, 2005) and on the distribution dimensions of injustice (Schlosberg, 2007), not much is known regarding how EJ claims are shaped over time and across scales and which are the key factors leading this process (Benford, 2005, Holifield et al., 2009). In this line, we will built on the analysis of some well-known Latin American mining conflicts, such as Pascua Lama (Chile) and Esquel (Argentina), in order to analyse the emergence and deployment of similar movements and their demands over time and across scales. One paper has been published in *Geoforum* already (Urkidi and Walter, 2011), with acknowledgment to ENGOV.

- **Buen Vivir and mining conflicts in Ecuador.** We aim to analyse how the meaning, scale and scope of Buen Vivir (Sumaq Kawsay) is being disputed by different actors at different scales in the mining debate in Ecuador. We point that while the Ecuadorian national government is publicly endorsing Sumaq Kawsay principles as a national policy it is fostering at the same time a policy of environmental “areas of sacrifice”-the sources of wealth for the whole country- giving legitimacy only to certain actors, values and perspectives. Such an approach is de-legitimizing local meanings of Sumaq Kawsay.

- **The politics of an environmental dispossessed social group: the case of the Ancient Mangrove Peoples of Ecuador** (with Sara Latorre). This case study analyzes the novel ethnic-based political strategy practiced by the grassroots social movement linked to the mangrove ecosystem in Ecuador. After more than forty decades of shrimp-farming production, the mangroves biophysical condition has been undermined and with that, the livelihood of mangrove people has turned critical. Within this context, this social movement adopted lately an ethnic discourse in order to claim collective territorial rights as a way to secure mangrove land titles and improve mangrove people well-being.

Since the 1990s, in Ecuador as well as in most part of Latin America, ethnic politics have played a prominent role. In this region, indigenous movements (and to a less extent afro-descendants movements) have mobilized discourses of cultural difference from dominant “white-mestizo” society in strategic ways in order to demand land titles, access institutional, financial and natural resources and make civil rights claims against the state. In this regard, due to its political power, their claims have been recognized within constitutional bodies across several Latin American countries, which, in turn, has re-defined the legal status of indigenous people (and afro-descendants) and the very meaning of citizenship. Accordingly, nowadays, ethnicity has become a powerful language for social mobilizing and political demands, especially for securing collective land rights. This case study will analyze conflicts on mangrove preservation in Ecuador in the light of such perspectives. International and national forces driving mangrove destruction will be the starting points of the analysis.

- **Ecological Distributive conflicts and Environmental justice. Is corporate voluntarism leading to environmental justice in the forestry sector in Latin America and Caribbean?** (with Miquel Ortega) This case study explores some of the characteristics and consequences

of the increasing importance of corporate voluntarism in the forestry sector using the conceptual framework of Environmental Justice. The case of the forest management in Latin America and Caribbean shows the merits and limits of this approach if environmental justice is considered to be a political objective. The role of regional authorities will be analysed and their capacity to create and enforce more demanding environmental regulations will be assessed. European initiatives on wood imports will be taken into account.

- **Socio-environmental conflicts in the Shrimp aquiculture in the Fonseca Gulf (Nicaragua and Honduras)** (with Miquel Ortega). In the last decades an important increase of the shrimp aquiculture at the Golf of Fonseca has taken place. This expansion has produced important environmental impacts: decreasing of mangrove areas, impacts in some of the most important wetlands, etc. Much less is known on the social implications, including the increasing number of armed conflicts and deaths. This study case will do a rigorous socio-environmental impact analysis under an environmental justice perspective.

- **Oil extraction conflicts in LA.** (with Marc Gavalda) This research will address recent trends in oil and gas exploration and exploration in Perú, in particular the Camisea Project and its environmental and social impacts. It builds on long experience of study of other fossil fuels related conflicts in Latin America, published in books in Bolivia and Argentina. It is collaborative research drawing on the knowledge of civil society groups.

- **Chinese actors in Latin American mineral extraction conflicts** (with Barbara Hogenboom). Since the global crisis that started in 2008, China is becoming a prominent investor in the region's oil and mining, including 'mixed deals' such as large energy-backed loans in which the Chinese government, state-owned banks and (state-owned) TNCs. This research the effect of the entry of Chinese actors and interests in this area of social and political contestation and conflict, involving a range of local, national and foreign actors from civil society, the private sector and the public sector. It aims to clarify what kind of resource extraction conflicts occur with Chinese companies in Latin America, how they react to local and national (social and political) environmental demands and requirements, and if there are any differences with other TNC operations and attitudes.

Case study package 3: Social Multicriterial Evaluation in extraction conflicts

This research line is currently being developed in Ecuador in coordination with Universidad Andina Simon Bolivar (ENGOV partner). (with Sara Latorre)

The government of Ecuador, in line with other Latin American governments, is currently fostering ore mining as a boost to the country' economy. Our research is carried out in Intag, in the north of the country. As Ecuadorian oil reserves run out and mineral prices rise (e.g. gold, silver and copper), mineral extraction appears as a solution (based on a “weak sustainability” approach) to support the national economy. President, Rafael Correa is consolidating a discourse according to which it is necessary to sacrifice national areas in order to promote national welfare. Many of the “sacrifice areas” under which copper and gold deposits lay are however highly biodiverse areas, and home of indigenous communities and peasants. Consequently, environmental conflicts are currently emerging along these new extractive frontiers.

We conduct a Social Multicriteria Evaluation (compatible with Scenarios and Visioning techniques) in order to structure and improve the transparency of an ongoing mining conflict in the Valley of Intag, Ecuador. The Valley of Intag is a highly biodiverse region located in the north of Ecuador, and is internationally known because its community has succeeded in stopping --since 1997- an open-pit copper mine project. The community is made of about 15.000 people that live mainly from agriculture (frijol, maize, banana, coffee), which is the basis of its subsistence and economy. Information about the impacts of the copper mine triggered a public mobilization that led to the rejection of the project and the expulsion of the Japanese mining company Bishimetals in 1997. In the 2000s, the project was bought by Ascendant Copper, a Canadian company, and in 2005, after more conflict, the mining camp was invaded and burnt, which resulted in the official cancelation of the project. Recent announcements made by the Ecuadorian government forecast however new attempts to extract copper from the Intag Valley.

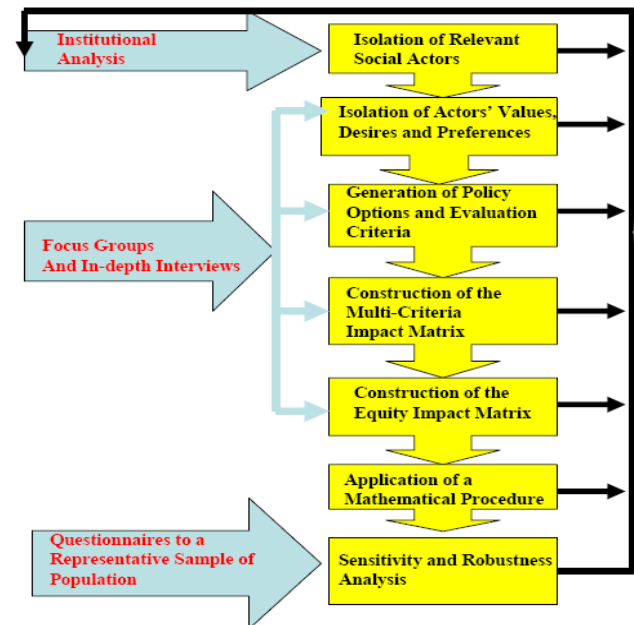
The local process of social organization -- triggered by the mining conflict- resulted in a unique experience of bottom-up organization and planning. In order to strengthen the local organizations and weaken the chances of a new mining attempt, economic alternatives were developed and promoted with the support of international donors. New organizations made of women, young, peasants and ecologists were formed; their projects produce and

commercialize handcrafts, hand made soaps, organic coffee, among other local products that are currently part of international just market networks. Ecotourism initiatives offering tours, community stays and activities in coordination with local organization and projects were also created. Moreover, HidroIntag, a community company aimed at developing a network of small decentralized hydro-power plants is currently negotiating a project with the local government. Community organizations argue that the local bottom-up development model promoted in Intag during the last decade is not compatible with mining activities (e.g. ecotourism, organic production and mini-hydros), and are trying to open a local and national debate on this issue.

The objectives of the research are to (a) structure and make transparent what is at stake with the different local development alternatives of Intag (i.e. mining, tourism); (b) Assess the different scenarios or development alternatives -- in its environmental, economic and socio-cultural dimensions- according to the criteria that are relevant to the local inhabitants; and (c) Provide a final document that contributes to local assessments and deliberations on local development alternatives.

The research is structured in 4 stages (the general steps of the social multicriteria Methodology are presented in Figure 3). Firstly, the research group made an initial literature review of Intag, the history of the mining conflict, the identification of the main actors and their values and concerns. Interviews to key actors were made to explore their values, interests, and the different development agendas and projects at stake in the region. Secondly, members of the research group lived in the Valley participating in local events and meetings. Workshops, interviews and field visits were conducted in order to identify the main needs and values of local inhabitants and local activities. Thirdly, the research group identified (a) different alternatives (analyzing and assessing current and potential activities and their compatibilities) and selected (b) a series of environmental, social and economic criteria based on local needs and values, and (c) indicators, able to assess quantitatively or qualitatively the different criteria. Finally, a SMCE matrix is been constructed and discussed. In October 2011, the research group plans to conduct local and national workshops to present and discuss preliminary results.

Figure 3: General steps of a social Multicriteria research



Source: Munda, 2008

References

Acselrad, H., 2008. Grassroots reframing of Environmental Struggles in Brazil. In: Carruthers, D. (Ed.) Environmental Justice in Latin America: Problems, Promise, and Practice. MIT Press, Cambridge, pp. 75-97.

Arnstein, S.R., 1969. A Ladder of Citizen Participation. JAIP Journal of the American Institute of Planners 35 (4), 216-224.

Baker, D.C., McLelland, J.N., 2003. Evaluating the effectiveness of British Columbia's environmental assessment process for first nations' participation in mining development. Environmental Impact Assessment Review 23 (5), 581-603

Bebbington, A., Bebbington, D.H., Bury, J., Langan, J., Muñoz, J.P., 2008. Mining and Social Movements: Struggles Over Livelihood and Rural Territorial Development in the Andes. *World Development* 36 (12), 2888-2905

Benford, R., 2005. The half-life of the environmental justice frame: Innovation, diffusion, and stagnation, in: Pellow, D., Brulle, R. (Eds.), *Power, Justice, and the Environment*. MIT Press, Cambridge, pp. 37–54.

Binimellis, R., Pengue, W., Monterroso, I., 2009. “Transgenic treadmill”: Responses to the emergence and spread of glyphosate-resistant johnsongrass in Argentina. *Geoforum* 40, 623-633.

Blaikie, P., Brookfield, H., 1987. *Land Degradation and Society*. Methuen, London. Bullard, R., 1990. *Dumping in Dixie: Race, Class, and Environmental Quality*. Westview Press, Boulder, CO.

Bunker, S. 2007. The poverty of resource extraction, in: A. Hornborg (Ed.): *Rethinking environmental history: Worldsystem history and global environmental change*. Lanham, MD, USA: Altamira Press.

Bullard, R., 1990. *Dumping in Dixie: Race, Class, and Environmental Quality*. Westview Press, Boulder, CO.

Bury J., 2005. Mining mountains: neoliberalism, land tenure, livelihoods, and the new Peruvian mining industry in Cajamarca, *Environment and Planning A* 37(2), 221 – 239

Bury, J., 2008. Transnational Corporations and Livelihood Transformations in the Peruvian Andes: An Actor-Oriented Political Ecology. *Human Organization* 67 (3), 307-321.

Canel, E., Idemudia, U., North, L. (Eds.), 2010. *Canadian Journal of Development Studies*, 30 (1–2). Rethinking Extractive Industry, Special Issue.

Carruthers, D., 2008. *Environmental Justice in Latin America: Problems, Promise, and Practice*. MIT Press, Cambridge, MA.

De Echave, J., Diez, A., Huber, L., Revesz, B., Lanata, X.R., Tanaka, M., 2009. *Minería y Conflicto social*. Instituto de Estudios Peruanos, Lima.

Eisenmenger, N., Ramos-Martin, J., Schandl, H., 2007. Transition in a changed context: patterns of development in a globalizing world, in: Fischer-Kowalski, M., Haberl, H. (Eds.),

Socioecological Transitions and Global Change: Trajectories of Social Metabolism and Land Use. Edward Elgar, Cheltenham, pp. 179–222.

Eurostat, 2001. Economy-wide material flow accounts and derived indicators. Available online report: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-34-00-536/EN/KS-34-00-536-EN.PDF

Fernández Jilberto, A.E., Hogenboom, B., 2010. Latin America and China. In Fernández Jilberto and Barbara Hogenboom (Eds.): Latin America Facing China. CEDLA, Amsterdam.

Fischer-Kowalski, M., 1997. Society's metabolism: on the childhood and adolescence of a rising conceptual star, in: Redclift, M., Woodgate, G. (Eds), The International Handbook of Environmental Sociology. Edward Elgar, Cheltenham, pp. 119–37.

Fischer-Kowalski, M., Weisz, H., 1999. Society as a hybrid between material and symbolic realms – towards a theoretical framework of society-nature interaction, in: Advances in Human Ecology 8, 215-251.

Fischer-Kowalski, M., Haberl, H., 1993. Metabolism and Colonization. Modes of Production and the Physical Exchange between Societies and Nature, in: Innovation - The European Journal of Social Sciences 6(4), pp. 415-442

Garmendia, E., Gamboa, G., Franco, J., Garmendia, J.M., Liria, P., Olazabal, M., 2010. Social multicriteria evaluation as a decision support tool for integrated coastal zone management. Ocean & Coastal Management 53, 385-403.

Gerber, J.F., 2011. Conflicts over industrial tree plantations in the South. Global Environmental Change 21 (1), 165-176.

Gerber, J.F., Steppacher, R., 2011. Towards an integrated Paradigm in Heterodox Economics. Palgrave Macmillan Eds.

Gerber, J.F., Veuthey, S., Martinez-Alier, J. 2009. Linking political ecology with ecological economics in tree plantation conflicts in Cameroon and Ecuador. Ecological Economics, 68(12), 2885-89.

Giljum, S., Eisenmenger, N., 2004. International trade and the distribution of environmental goods and burdens: a biophysical perspective. J. Environ. Dev. 13 (1), 73–100.

Gonzalez-Martinez, A.C., Schandl, H., 2008. The biophysical perspective of a middle income

economy: material flows in Mexico. *Ecol. Econ.* 68 (1–2), 317–327.

Gudynas, E., 2011. Good Life: germinating alternatives to development. Available at: <http://alainet.org/active/48054>, (14 July 2011)

Haarstad, H., Floysand, A., 2007. Globalization and the power of rescaled narratives: A case of opposition to mining in Tambogrande, Perú. *Political Geography* 26, 289-308.

Haas, W, Hertwich, E, Hubacek, K, Korytarova, K, Ornetzeder, M, Weisz, H., 2005. The Environmental Impacts of Consumption: Research Methods and Driving Forces. IIASA Interim Report IR-05-027.

Haberl, H., Fischer-Kowalski, M., Krausmann, F., Weisz, H., Winiwarter, V., 2004. Progress towards sustainability? What the conceptual framework of material and energy flow accounting (MEFA) can offer. *Land Use Policy* 21(3), 199-213.

Holified, R., Porter, M., Walker, G., 2009. Introduction Spaces of Environmental Justice: Framework for Critical Engagement. *Antipode* 41 (4), 591-612.

Hornborg, A., 1998. Towards an ecological theory of unequal exchange: Articulating world system theory and ecological economics. *Ecological Economics* 25, 127–136.

Hornborg, A., 2009. Zero-sum world: challenges in conceptualizing environmental load displacement and ecologically unequal exchange in the world system. *International Journal of Comparative Sociology*, 50 (3–4), 237–262.

Jackson, T., 2009. Prosperity without growth. Earthcan: London.

Kapp, K.W., 1950. The Social Costs of Private Enterprise. Harvard U.P, Cambridge.

M'Gonigle, M., 1999. Ecological economics and political ecology: towards a necessary synthesis. *Ecol. Econ.* 28 (1), 11–26.

MAGyP (Ministerio de Agricultura, Ganadería y Pesca de Argentina), 2011. Agricultural Integrated Information System. Available at: <http://www.sii.gov.ar/>. (Accessed March 15, 2011.)

Martinez-Alier J., Munda G., O'Neill J., 1998. Weak comparability of values as a foundation for ecological economics. *Ecological Economics* 26, 277-286.

Martinez-Alier, J., 2001a. Mining conflicts, environmental justice, and valuation. *Journal of*

Hazardous Materials 86, 153–170.

Martinez-Alier, J., 2009. Social metabolism, ecological distribution conflicts, and languages of valuation. *Capitalism Nature, Socialism* 20 (1), 58–87.

Martínez-Alier, J., 2002. *The environmentalism of the poor: a study of ecological conflicts and valuation*. Edward Elgar, Cheltenham. Oxford University Press, Delhi.

Martinez-Alier, J., O'Connor, M., 1996. Ecological and economic distribution conflicts, in: Costanza, R., Segura, O., Martinez-Alier, J. (Eds.), *Getting Down to Earth: Practical Applications of Ecological Economics*. Island Press, Washington, pp. 277–286.

Martinez-Alier, J., Kallis, G., Veuthey, S., Walter, M., Temper, L., (2010). Social Metabolism, Ecological Distribution Conflicts, and Valuation Languages, *Ecological Economics* 70(2), 153–158.

Moore, J.W., 2000. Sugar and the expansion of the early modern world-economy: commodity frontiers, ecological transformation, and industrialization. *Review (Fernand Braudel Center)* 23, 409–433.

Munda, G., 2008. *Social Multi-Criteria Evaluation for a Sustainable Economy*. Springer-Verlag, Berlin-Heidelberg.

Muñoz Jaramillo, P., 2011. *Essays on international trade and the environment. An input-output analysis*, Doctoral Thesis, UAB, 2011.

Muradian, R., Walter, M., Martinez Alier, J., (in press). Hegemonic transitions and global shifts in social metabolism: Implications for resource-rich countries. Introduction to the special section. Submitted to *Global Environmental Change*.

Muradian, R., Martinez Alier, J., Correa, H., 2003. International capital vs. Local population: the environmental conflict of the Tambogrande mining project. *Peru. Society and Natural Resources* 16 (9), 775–792.

Pengue, W., 2001. Impactos de la expansión de la soja en Argentina. *Revista Biodiversidad, Grain*, Barcelona. Available at: <http://www.grain.org> (Accessed March 15, 2011).

Perreault, T., 2006. From the Guerra del Agua to the Guerra del Gas: Resource Governance, Neoliberalism and Popular Protest in Bolivia. *Antipode* 38(1).

Raikes, P., Jensen, M.F., Ponte, S., 2000. Global commodity chain analysis and the French filière approach: comparison and critique. *Economy and Society* 29 (3), 390-417.

Robbins, P., 2004. *Political Ecology*. Blackwell, Oxford.

Roca, J., Padilla E., Farré, M. and Galletto V., 2001. Economic growth and atmospheric pollution in Spain: discussing the environmental Kuznets curve hipótesis. *Ecological Economics* 39, 85-99.

Roman, Ph., 2009. *Distribution écologique, distribution économique et soutenabilité. Une tentative de synthèse*, Master thesis, UVSQ, Versailles.

Russi, D., Gonzalez, A.C., Silva-Macher, J.C., Giljum, S., Martinez-Alier, J., Vallejo, M.C., 2008. Material Flows in Latin America: A Comparative Analysis of Chile, Ecuador, Mexico, and Peru, 1980-2000. *Journal of Industrial Ecology*, 12(5-6), 704-720.

Schneider, F., Kallis, G., Martinez-Alier; J., 2010. Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. Introduction to this special issue. *Journal of Cleaner Production* 18 (6), 511-518.

Schlosberg, D., 2007. *Defining Environmental Justice: Theories, Movements, and Nature*. Oxford U, P, New York.

Singh, S., Krausmann, F., Haberl, H., Erb, K., Gingrich, S., Temper, L., Martinez-Alier, J., Forthcoming. India's biophysical economy, 1961-2008. Sustainability in a national and global context. *Ecological Economics*, in press.

Stern, D., 2004. The rise and fall of the environmental Kuznets curve. *World Development* 32, 1419–1439.

Suryanata K., Umemoto K. 2005. Beyond environmental impact: articulating the “intangibles” in a resource conflict. *Geoforum* 36, 750-760.

Svampa, M., Antonelli, M. (Eds), 2009. *Minería transnacional, narrativas del desarrollo y resistencias sociales*. Bilbao, Buenos Aires.

Teubal, M., 2006. Expansión del modelo sojero en la Argentina. De la producción de alimentos a los commodities. *Realidad Económica*, 220, 71-96.

Urkidi, L., Walter, M., 2011. Environmental Justice dimensions in anti-gold mining

movements in Latin-America. *Geoforum* 42, 683-695.

Urkidi, L., 2010. A Glocal Environmental Movement against Gold Mining: Pascua Lama in Chile. *Ecological Economics*, 70(2), 219-227.

Vallejo, M. C. 2010. Biophysical structure of the Ecuadorian economy, foreign trade and policy implications. *Ecological Economics* 70(2), 159-169.

Vallejo, M.C., Perez Rincon, M.A., Martinez-Alier, J. 2011. Metabolic Profile of the Colombian economy from 1970 to 2007. *Journal of Industrial Ecology* 15, 245–267.

Wallerstein, I., 1974. *The Modern World-system: Capitalist agriculture and the origins of the European world-economy in the sixteenth century*. Academic Press, New York.

Walter, M., Martinez-Alier, J. 2010. How to Be Heard When Nobody Wants to Listen: the Esquel mining conflict, *Canadian J. of Development Studies*, 30(1-2).