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SOCIAL-ECOLOGY : EXPLORING THE MISSING LINK IN SUSTAINABLE DEVELOPMENT

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Social-ecology: Exploring the missing link in sustainable development

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Abstract

Environmental challenges are, at their root, social problems that arise from income and power inequality. Thus, inequality is an environmental issue just as environmental degradation is a social issue (forming a “social-ecological nexus”), and solutions must address them jointly through principles and institutions rooted in justice. This article develops a two-sided “social-ecological” approach to offer both analytical and empirical insights into the dynamics of this relationship and a policy path forward.

Keywords: social-ecology, social-ecological nexus, inequality, social-ecological transition.

1. A Social-Ecological Approach

We are facing a paradox of environmental emergency: over the past decade, as global environmental problems such as climate change have grown more daunting and tangible, the ability of institutions and organizations to rise to the challenge has seemingly diminished. How to make sense of the fact that the more we know, the less we act?

First, the environmental movement has not yet succeeded at articulating a vision of human well-being and environmental resilience that embeds ecological challenges in tangible social realities. Because of this failure, it now faces the risk of being reduced to what John Maynard Keynes called in a different context a “party of catastrophe,” disseminating unbearable anxiety without offering solutions deemed feasible by a majority of citizens.

Second, amidst the “great recession” in Europe and the US, anemic economic recovery, sluggish job creation, and widening social inequality have conspired to minimize and even marginalize “long-term” environmental preoccupations in the face of “urgent” social needs. This “de-prioritization” of environmental policy is often justified on the side of policy-makers by the poor state of public finance and the need for fiscal austerity, but citizens themselves seem to succumb to short-termism: recent opinion surveys in the US and the European Union have revealed a public increasingly willing to sacrifice environmental protection for economic growth.ⁱ

To address such challenges with the comprehensiveness and urgency required, we must acknowledge the interrelatedness of social and environmental problems. Environmental challenges are, at their root, social problems that arise from income and power inequality. Thus, inequality is an environmental issue just as environmental degradation is a social issue, and solutions must address them jointly through principles and institutions rooted in justice. A “social-ecological” approach can offer both analytical and empirical insights into the dynamics of this relationship and a path forward.ⁱⁱ

On the analytical level, the social sciences hold the key to the solution of the severe environmental problems that “hard” sciences have revealed over the last three decades. The power of social cooperation has enabled humans to dominate earth systems, and humans will need to harness that same power of cooperation responsibly to guarantee the planet’s continued hospitality. The issue at stake, it should be noted, is not to “save the planet” but to save the planet’s hospitality for humans and to preserve the most vulnerable among us from

the severe consequences of our collective in consequence. But we lack the social-ecological knowledge needed to help citizens learn how to reform the social systems that frame human attitudes and behaviors so that they can preserve their natural life support systems.

The social-ecological approach (Laurent 2011a; 2011b; 2012; 2014) is aimed at addressing this knowledge gap by considering the reciprocal relationship between social and environmental issues, demonstrating how social logics determine environmental damage and crises and exploring the reciprocal relation i.e. the consequences of these damages on social inequality.

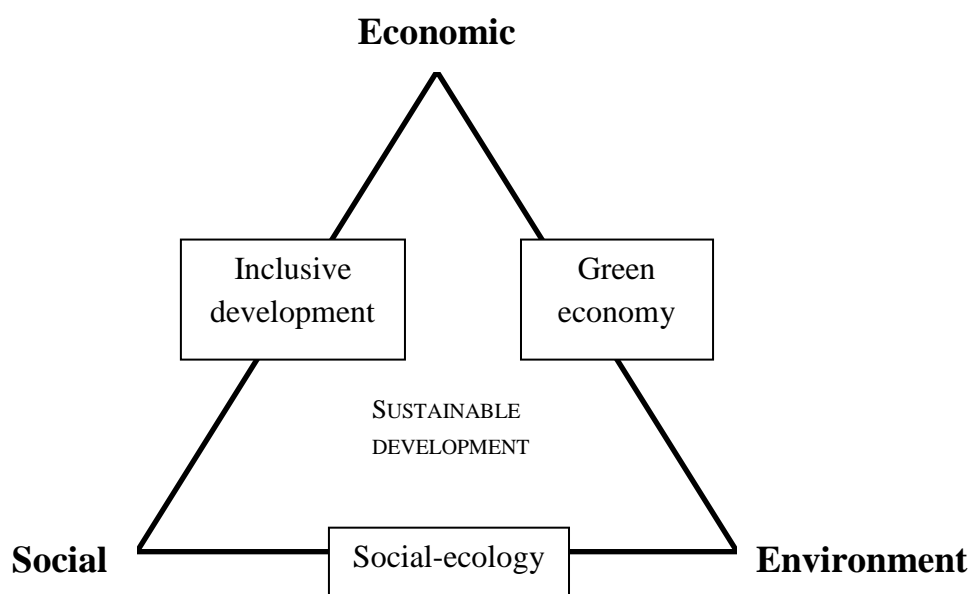
The first arrow of causality, that runs from inequality to environmental degradation, can be labelled ‘integrative social-ecology’, as it shows that the gap between the rich and the poor and the interaction of the two groups leads to the worsening of environmental degradations and ecological crises that affect every member of a given community (the scale of the community can vary from local to global). The reciprocal arrow of causality that goes from ecological crises to social injustice can be labelled ‘differential social-ecology’, as it shows that the social impact of ecological crises is not the same for different individuals and groups, given their socio-economic status.

Environmental risk is certainly a collective and global horizon but it is socially differentiated. Who is responsible for what and with what consequences for whom? Such is the two-sided social-ecological question.

On the empirical level, the social-ecological approach reveals the existence of a strong, reciprocal, and complex relationship between social justice and ecology. On one hand, social inequalities drive ecological crises. They increase the ecological irresponsibility of the richest in society and among nations. Moreover, such inequalities fuel the demand for economic growth among the rest of the population, increase social vulnerability, lower environmental sensitivity, and hinder collective action. On the other hand, ecological crises create new forms of inequality. Structural “environmental inequalities” are rising in developed countries and developing countries alike, creating feedback loops of environmental and social degradation. Similarly, “social-ecological” disasters, like the devastation caused by Hurricane Katrina in 2005 or Typhoon Haiyan in November 2013, are anything but natural: their causes are more and more human, and their impacts are determined by social factors like economic development, inequality, and democracy.

Sustainable development assembles three dimensions: economic, social and ecological. While the economic-social and economic-ecological links have been explored in great detail in recent years (resulting in, respectively, the “inclusive development” and “green economy” paradigms, see figure 1), the social-ecological link is more obscure. This paper intends on shedding some light on this missing link in sustainable development.

Figure 1: the three linkages of sustainable development



Before doing so, we should acknowledge that some international institutions have tried to bring the issue at the forefront of the global agenda, most notably the Human Development Report Office of the United Nations and the IPCC. In 2011, the former released “Sustainability and Equity: A Better Future for All”, arguing that “the urgent global challenges of sustainability and equity must be addressed together – and identifies policies on the national and global level that could spur mutually reinforcing progress towards these interlinked goals.” The link between equity and sustainability has also emerged in the third installment of the AR5 IPCC Report. In a book-long chapter, the authors note with “high confidence” that “equity is an integral part of sustainable development”. More specifically, they argue that three dimensions should be considered in both mitigation and adaptation climate policy: “a moral justification that draws upon ethical principles; a legal justification that appeals to existing treaty commitments and soft law agreements to cooperate on the basis of stated equity principles; and an effectiveness

justification that argues that a fair arrangement is more likely to be agreed internationally and successfully implemented domestically". The research on the critical, reciprocal and complex link between social inequality and ecological crises and degradations - the social-ecological nexus - is spreading.

2. How Inequality Pollutes Our Planet

While there are many good reasons for strengthening democracy against the corroding force of inequality, the environmental one may be as fundamental as it is overlooked. Opponents of such a case for environmental action either deny the existence and severity of the inequality crisis or assert that the reduction of inequality would, in fact, worsen environmental crises. Whereas the first argument can be readily disproven, the latter merits more attention.

Research on inequality indeed dismisses the first counterargument.ⁱⁱⁱ In the 1990s and 2000s, "global inequality," or inequality between world citizens (the sum of international income inequality weighted by demography and intra-national inequality), began to decrease for the first time in a century; however, the decline of poverty in China accounts for most of this decline.^{iv} In fact, if one excludes China and its demographic weight, then international inequality has sharply increased in the last two decades. Moreover, innumerable studies and reports for developed and developing countries alike have attested to the growth of intra-national inequality in the last thirty years (see among others Atkinson and Piketty 2010, Atkinson, Piketty and Saez, 2011 and OECD, 2011).

What about the second argument? Because environmental damage results from the progress towards development, some in fact argue that eradication of poverty, rather than poverty itself, is the major obstacle to sustainability. There is, in economic terms, an apparent trade-off: the decline of poverty, along with the general improvement of the human lot, comes at the cost of the destruction and degradation of ecosystems and biodiversity. This trend prevailed throughout much of the 20th century. As human development indicators have increased, global biodiversity has declined. For instance, from 1970 to 2010, the Human Development Index improved on average by about 40%, while the global biodiversity index fell by 30% to 50% (HDRO, 2010 and WWF, 2012 and 2014).

Such a perspective, however, ignores the micro-ecological and macro-ecological dimensions of rising inequality. Let's first consider the micro-ecological level, i.e. the behavior of rich and poor in isolation. With respect to the rich, Thorstein Veblen showed that the middle class'

desire to imitate the lifestyles of the upper class can lead to a cultural epidemic of environmental degradation. Veblen called this phenomenon “conspicuous consumption,” and the bigger cars, larger houses, more luxurious goods, etc., that the rich buy and the middle class desire have a heavy environmental toll. With regard to the poor, Indira Gandhi explained in her speech at the first international environmental summit in Stockholm in 1972 that “poverty and need are the biggest polluters.” In the developing world, poverty is indeed leading to unsustainable environmental degradation, such as the dramatic depletion of forest cover in Haiti or Madagascar, the product of a losing trade-off between present and future welfare.^v Since the wealth of the world’s poor lies in natural capital, because of lack of access to other forms of capital, the depletion of such natural resources leads to further impoverishment. The eradication of poverty, thus, is not only a social cause but also an environmental one, provided that it takes the form not of a game of consumerist catch-up, but of a redefinition of comprehensive wealth, its components, and its indicators.^{vi}

On the macro-ecological level - where the interaction of rich and poor and its environmental outcome is considered - it can be shown that a political economy lies behind environmental degradation (Boyce, 2002 and 2013). Without winners (those who derive a net benefit), environmental degradation would not occur, but without losers (those who bear net costs), such degradation would not be a question of well-being. The winners are able to impose the costs of environmental degradation onto the losers because the losers are either not yet born, ignorant of the consequences of the degradation, or lacking in the power to limit them. Five macro-ecological channels through which rich and poor interact in environmental degradations, crises, and policies stand out in particular.

1) Inequality increases the need for environmentally harmful and socially unnecessary economic growth.

Inequality inflates the need for economic growth. If wealth accumulation in a given country is increasingly captured by a small fraction of the population, the rest of the population will need to compensate with additional economic development. Paul Krugman summed this up well: “Here’s a radical thought: if the rich get more, that leaves less for everyone else.”^{vii} Since virtually no country in the world has managed to decouple (in absolute or net terms) economic growth from its negative environmental impact, e.g., carbon emissions or waste, more economic growth currently means more of such “bads,” whether locally or globally.^{viii} In the United States, between 1993 and 2011, one percent of the population managed to

capture seventy-five percent of economic growth. A more even distribution of income (i.e. a growth of income of 2% for the top 10% and bottom 90% of the income distribution alike) would have reduced the total growth necessary to meet the needs of the vast majority of Americans and led to a small decline in CO2 emissions (author's calculation based on Piketty and Saez, 2013).

But the equalization of economic conditions could, in fact, increase the ecological challenge since the marginal increase of environmental degradation is higher at the bottom of the income distribution than at the top. However, such conclusions assume that the reduction of inequality would entail spreading the lifestyles, wasteful consumption, and ecological footprint of the richest. If so, then the ecological pressure would indeed become unbearable: ecological footprint data clearly show that high income countries drive the global "ecological deficit". But an alternative view holds that shifting from captured development to shared development while redefining development itself can in fact create the necessary room for sustainable social progress.

2) Inequality increases the ecological irresponsibility of the richest, within each country and among nations.

Widening inequality exacerbates the fundamental tendency of capitalist enterprises to maximize profits by externalizing cost and turning socially deprived areas into "pollution havens" within countries and across their borders. The financialization of the economy over the past three decades has exacerbated this tendency by shortening time horizons and increasing indifference to unsustainable natural assets management. As the gap between rich and poor grows, governments and businesses find it easier to transfer the environmental damage of the activities of the rich to the neighborhoods of the poor. Income and power inequality, that tends to dissociate polluters from payers, thus act as a disincentive for ecological responsibility or as an accelerator of ecological irresponsibility.

On the consumption side, the richest consumers present a paradox. They declare in surveys that they care more about the environment than the poor do, and they are indeed, according to the same surveys, more likely to adopt the best environmental practices or to favor more ambitious environmental policy (see OECD, 2008). However, at the same time, they pollute more than the poor in volume because of their higher incomes and more expensive lifestyles. They are also more able to protect themselves from the negative impacts of their behavior as they become richer.

Widening inequality therefore increases not only the demand for a better environment among the richest but also their ability to acquire this good at a lower cost by transferring all corresponding environmental damages to the poorest. For example, in Spain, water has increasingly been diverted from small agricultural enterprises to large coastal tourist facilities. Wealthy tourists enjoy water as a natural amenity and are able to transfer the cost of its abduction and stress to growingly impoverished farmers who now face structural droughts.

On the production side, a company faces two essential options to reduce the environmental cost of its production. On the one hand, it can try to adopt the best available technology and to reduce the environmentally harmful impact of its production, a decision that can entail a high economic cost in the short run. On the other hand, it can seek to minimize the economic cost of the social compensation public authorities might demand from it. Income and power inequality will lead the company to relocate to a socially deprived area where people have low incomes and weak political mobilization capacities. The residents of that area would be, presumably, less willing to pay for environmental quality and therefore would demand lesser compensation for environmental damage. Likewise, the feeble political capability of the residents would limit the risk of the emergence of collective action to resist the damaging production (see *infra* about the effect of inequality on collective action capability).

These dynamics also apply internationally and explain why inequality between countries can result in tragic but avoidable environmental disasters like the chemical pollution in Bhopal in December 1984 or the current degradation of the Niger Delta. Climate change is another case in point: Western societies are less likely to reduce their greenhouse gas emissions because they have little economic incentives to do so as long as they are able to adapt to the most devastating effects of climate change. The reverse is of course true for low-income countries, which contribute little to global emissions but will pay the highest human price for the coming destructive climate. The most striking example of this global injustice may be Africa. The continent accounts for less than 3% of global emissions, but water stress in Africa due to climate change could threaten the well-being of up to 600 million people in the coming decades.

These mechanisms could also account for the striking disparity in biodiversity preservation around the world, as measured by the World Wildlife Fund's Living Planet Index.^{ix} The index has fallen by about 30% globally in the last four decades (new methodology concludes that the fall was of the order of 50%), but the decline has been uneven. From 1990 to 2008, the

index increased in developed countries by 7%, but it plummeted by 31% in middle-income countries and by 60% in low-income countries. According to the WWF, geographic factors explain only a fraction of the difference. International inequality likely plays an important role, for richer countries are able to preserve their biodiversity while simultaneously exploiting that of countries rich in natural capital but poor in income. For this very reason, evaluations of the ecological impact of a region like the EU, which imports much of its energy and raw materials, should take into account the damage done outside the region, in the original source of production and extraction.^x

3) Inequality, which affects the health of individuals and groups, diminishes the social-ecological resilience of communities and societies and weakens their collective ability to adapt to accelerating environmental change.

A substantial body of research, initiated by Richard Wilkinson and Michael Marmot, has confirmed the negative impact of social inequality on physical and mental health at the local and national level.^{xi} Inequality also acts as an underlying driver of many diseases perceived as natural or biological in the developing world. Paul Farmer, for instance, has asserted that “inequality itself constitutes our modern plague.”^{xii} Myriad governmental and international institutions have already begun to embrace this avenue of research in crafting policy agendas (the WHO to name only one).

In parallel, the concepts of social (and even social-ecological) resilience and vulnerability are now common in the discourse of environmental science. Environmental scientists have begun to describe vulnerability to “natural” disasters as a function of exposure and sensitivity to a given shock, on the one hand, and adaptive capacity and resilience, on the other. Considered within this framework, inequality increases exposure and sensitivity and weakens adaptive capacity and resilience: it acts as a multiplier of the social damage caused by environmental shocks for developed and developing countries alike.

4) Inequality hinders collective action aimed at preserving natural resources

According to the “logic of collective action” (the classic theoretical framework formulated in Olson, 1965), a small group of wealthy individuals, convinced that they are the ones who will receive the greatest benefit from environmental protection, would be ready to pay the high cost of ambitious environmental policies. The few (richest), the argument goes, have a logistic comparative advantage over the many (poor). Accordingly, a larger group of people, with

more heterogeneous revenues, would not be able to find ways to effectively organize to protect the environment.

This line of reasoning, which suggests that inequality is actually favorable to the preservation of natural resources, has been proven wrong both theoretically and empirically.^{xiii} A number of studies have shown that inequality is, in fact, adverse to the sustainable management of common resources as it disrupts, demoralizes, and disorganizes human communities.^{xiv} The work of the late Elinor Ostrom in particular demonstrated that institutions that allow communities to preserve resources essential to their long-term well-being are based on principles of reciprocity and fairness, the very opposite of inequality. Her critics however make one important point: the difficulty of extrapolating from a purely local context.

In order to account for scale, an analysis of the negative impacts of inequality on environmental decision-making must look toward national and international examples as well. The contemporary United States provides a useful illustration in this respect. Since the 1980s, the US has retreated from the ecological world stage, gradually transferring its prior role of global environmental leader to the European Union. Rapidly increasing income inequality and the corresponding political repercussions might provide an illuminating explanation for this turn of events.

Environmental policy-making requires a broad consensus transcending party boundaries, and the simultaneous rise of income inequality and political polarization (understood as growing distance between parties) has reduced the possibility of such bipartisan cooperation. It is now almost impossible in the US to enact ambitious legislation of the caliber of that passed in the 1970s, which later became a model for other nations. While the EPA was formed in 1970, at the beginning of the golden decade for environmental legislation, it is now much more difficult even to confirm a director for the agency. The EPA is also, internally, the subject of political pressure motivated by industrial lobbying, especially from fossil fuels companies that have been empowered by growing economic inequality.

As studies have identified a correlation between income inequality and political polarization in the US, we can think of environmental policy as one of the many policy casualties of the “dance” between these two trends.^{xv} Political polarization and economic inequality both deepened over the past decade. Correspondingly, inertia in the face of environmental degradation has worsened, with the devastation of the Appalachian region and the sabotage of climate negotiations. In this latter case, as with other domestic and global environmental

challenges, polarization is combined with an overall shift to the right of the political spectrum, so that the status quo caused by polarization results in a more pro-business and anti-environmental policy.

This polarization dynamic at the local and national level replicates itself on the global scene. Recent research, for instance, has shown that “support is higher for global climate agreements that distribute costs according to prominent fairness principles.”^{xvi} Equality and fairness among parties to international environmental negotiations appears to be a key feature of successful global ecological governance (like the Montreal Protocol on ozone layer depleting substances). On the contrary, inequality in the negotiation process (procedural inequality) and/or distribution of costs (distributive inequality) among Nation States can alter the progress of ecological sovereignty pooling, as with UNFCCC conferences.

Finally, recent research (Motesharrei et al, 2014) goes a step further by arguing that inequality could play a key role in bringing about a global ecological collapse. The study investigates the possibility of civilizational collapse, drawing on a rich literature and relying on a new model named “HANDY” (Human And Nature Dynamical) which particularity is to add to already existing features of earth models a social stratification variable. Humans, in the model, are divided between “Elites” and “Commoners” and their consumption of natural resources is differentiated according to their economic and political power.

The model’s key insight is that ecological collapse can not only come about because of “the stretching of resources due to the strain placed on the ecological carrying capacity” but also due to “the economic stratification of society into Elites [rich] and Masses (or “Commoners”) [poor]”. The grim conclusion of the authors regarding one of their key scenarios goes as follows: “the Elites eventually consume too much, resulting in a famine among Commoners that eventually causes the collapse of society”. Yet, the study also shows that this seemingly irresistible collapse by inequality can be prevented through a reduction of current levels of social stratification, a more equal distribution in the consumption of natural resources and a higher efficiency in this consumption (although technological progress alone can not, in the model, prevent the collapse).

5) Inequality reduces the political acceptability of environmental preoccupations and the ability to offset the potential socially regressive effects of environmental policies

Surveys on the political economy of environmental policies have shown that people generally view such policies as socially regressive, which they can, in fact, be.^{xvii} Growing relative and absolute inequality can thus translate into a reduced acceptability of short-term social (real or perceived) “sacrifices” for long-term (social-ecological) benefits. The failure of France to adopt a carbon tax in 2009/2010 illustrates this argument.^{xviii} The socially regressive effect of the tax was obvious, as the bottom 20% of French households spend 2.5 times as much of their income on energy as the top 20% of households do (Laurent, 2011). Unsurprisingly, polls reported that as much as 66% of the French population opposed the carbon tax, mostly on economic grounds, with a sharp division between lower-income and higher-income social categories. The government eventually decided to abandon the project in March 2010 after a grueling political defeat amidst rising unemployment and poverty in the context of the “great recession”.

The public budget constraints produced by growing inequality, which translates at the macroeconomic level into lower aggregate demand and lower tax revenues (Stiglitz, 2012) further exacerbate the problem of political acceptability. Inequality makes it more complex and costly, if not impossible, to implement effective compensation mechanisms to counteract possible regressive effects of certain environmental policies, because there are too many people to compensate with too little resource (Nordic countries have been able to successfully implement carbon taxation precisely because they have very low income inequality levels, dynamic economies, and efficient welfare states which foster social consensus). However, social compensation for policies like carbon taxes is a key factor to their political acceptability and even their economic efficiency. In fact, all countries and localities that have adopted carbon taxes over the last two decades have also adopted compensation mechanisms for households and firms which overcame the initial resistance from citizens and businesses. Such mechanisms explain why Sweden was able to implement and maintain a carbon tax in the 1990s and the 2000s, with a rate that now exceeds 100 euros per ton of CO₂.

3. How Environmental Devastation Degrades Our Society

While the impact of inequality on environmental crises that has been detailed in the previous section may be harder to grasp, the reverse relation is easier to understand and to explain. Environmental conditions determine well-being, most prominently through health-related factors. Therefore, environmental degradation leads to significant and socially differentiated well-being impact. Environmental justice scholars and activists have indeed shown that a

public policy arsenal or a welfare state aiming at social fairness that fails to account for environmental conditions will ultimately fail.

1) The four forms of environmental inequality

As contemporary ecological crises worsen, the threat to social justice posed by environmental inequalities rises simultaneously. One can think of four types of environmental inequality:

- Environmental inequality in exposure and access, resulting from the unequal distribution of environmental quality between individuals and groups. Exposure to environmental nuisances, risks, and hazard, on one hand, should be distinguished from inequality in access to environmental amenities, such as green spaces but also energy. Fuel poverty, which is the outcome of unequal social access to energy, is becoming a considerable social problem in a number of European countries. In the UK, estimates show that fuel poor households have tripled since 2003 and in 2011 affected close to 15% of the population.^{xix}
- Environmental inequality regarding the effects of public policy arises when the impact of environmental policies are unevenly distributed among individuals and social groups. For instance, energy taxation could end up disproportionately burdening those on the lower side of the income spectrum.
- Environmental inequality with respect to involvement in policy-making means that individuals and groups with more resources have more access to environmental policymaking on a local, national, or global level.
- Finally, the lifestyles of different individuals and social groups have unequal environmental impacts.^{xx}

These various environmental inequalities (for a study of environmental inequalities in France, see Laurent 2014b) can morph into persistent social inequalities through institutions or natural disasters, two points to which we now successively turn.

2) The feedback loop of environmental and social injustice

Environmental inequalities can produce lasting and severe damage on the socially disadvantaged, perpetuating and exacerbating injustice. Studies on the effects of air pollution in Los Angeles have shown how exposure to atmospheric pollution affects school performance through the impact of respiratory diseases developed by exposed children.^{xxi} It has been also shown that children from poor families are more likely to be born with poor health because of the polluted environment experienced by their mothers during pregnancy (Currie, 2011). This, in turn, results in poor educational attainment and eventually lower income and lower social status.

As Janet Currie eloquently remarks and convincingly documents, a feedback loop of injustice thus arises between environmental inequalities and social inequalities fueled by “mechanisms underlying the perpetuation of lower socioeconomic status”: “Poor and minority children are more likely to be in poor health at birth, partly because their mothers are less able to provide a healthy fetal environment. Poor health at birth is associated with poorer adult outcomes, which in turn provide less than optimal conditions for the children of the poor.”

3) The human origins of “natural” disasters

How much do social factors on the one hand and fate on the other determine the human impact of “natural disasters”? This question was on philosophers’ minds as early as the mid-18th century. In the aftermath of the 1755 Lisbon earthquake, French philosophers Jean-Jacques Rousseau and Voltaire started a fiery and eventually bitter argument over whom or what was to be held responsible for the disaster, which had killed close to a hundred thousand people. Voltaire blamed divine providence while Rousseau blamed humans, responsible for their concentration in cities prone to disaster. Interestingly enough, the Lisbon earthquake is credited with triggering modern seismology study.

Current developments give increasing weight to Rousseau’s view: social factors do play a crucial role in so-called “natural” disasters, which are more appropriately “social-ecological.” Their causes and impacts are more and more the results of actions taken by human societies, with earthquakes as a particularly striking example: countries like Japan have learned throughout the 20th century to literally immune themselves from earthquakes’ human impact, but not all countries have had the means to do so, an obvious observation when one considers

the consequence of the two similarly powerful earthquakes that devastated Haiti in 2010 and barely affected Japan in 2011. The social nature of “natural” disasters is also on clear display when one considers the socially (and racially) differentiated toll of the heat wave that struck Chicago in 1995 and Paris in 2003 (see Laurent, 2010) or the hurricane that hit New Orleans in 2005.

One can thus make two points that both call for action: human impact exacerbates natural disasters and makes some of them more frequent; much of the damage from all natural disasters occurs because of insufficient and unsustainable planning and a lack of foresight (e.g. the devastation associated with Typhoon Haiyan in November 2013). Local and national policymakers must thus anticipate announced and virtually certain future disasters - especially heat waves and floods in rich countries and severe hurricanes in poor countries - if they wish to spare their citizens implacable future injustice.

In particular, the role played by structural environmental inequalities but also the lack of social capital in certain communities exposed to social-ecological disasters such as heat waves or hurricanes warrants deeper analysis. For example, minorities face more exposure to the risks connected to urban heat island effect because their neighborhoods often lack tree cover or contain too much impervious surfaces, such as asphalt and concrete.^{xxii}

To address both the role of inequality in environmental crises and the social impact of environmental degradation, a true social-ecological approach to public policy is needed.

4. Re-designing the welfare state on a social-ecological foundation

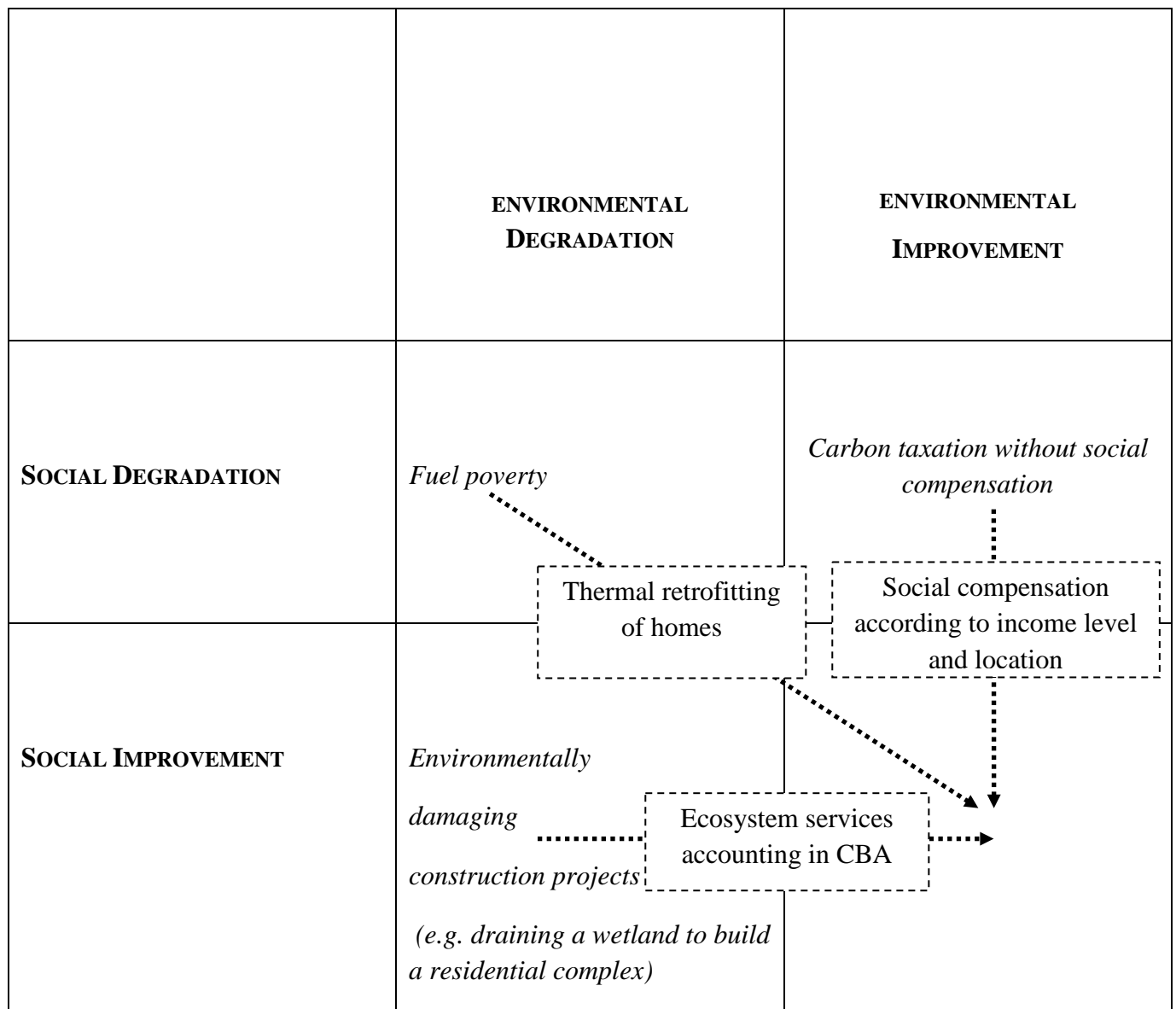
The welfare state, founded in the 1880s in unified Germany, is based on the idea that humans have the right to be protected from the vagaries of Nature and social life. The “social security” currently guaranteed to less than 30% of the world population by national welfare states is a considerable extension of the civil security that Hobbes entrusted the Leviathan with in the mid-1600s. The next step consists in moving from social security toward social-ecological security by recognizing that the nature of human welfare and social risk has changed at the end of the 20th century: because of worsening ecological crises, environmental conditions will play an ever-increasing role both in risk and welfare, while our environmental crises are evolving from a logic of uncertainty to a logic of risk, calling for insurance.

In this respect, there is no fundamental difference between social and environmental policy: both aim at correcting market economy failures such as imperfect information, incomplete markets, externalities, etc. that justify public intervention (Laurent, 2014a). As a matter of fact, climate change has been called the “the biggest market failure the world has seen” (Stern, 2008). A social-ecological state should therefore fulfill the traditional allocation, redistribution and stabilization functions provided by a welfare state, but in the environmental domain. For example, in allocating resources, policy-makers must acknowledge the current social cost of environmental crises (respiratory diseases, cancer, etc.) and anticipate their future social cost. The same is true of the redistribution function: resources should be redistributed not only on the basis of age, income level or employment status but also on the basis of vulnerability of certain communities and/or locations with respect to climate change risk.

But how should we implement such a social-ecological approach and design social-ecological policies? A social-ecological approach requires identifying the relations, sometimes intractable, that bind social issues and environmental challenges - recognizing the environmental dimension of social issues and revealing the social implications of environmental challenges. In many cases, there will be trade-offs between environmental and social outcomes. However, social-ecological policies must aim at overcoming such trade-offs and at achieving better outcomes in both dimensions simultaneously. This is a very important point in the current context of economic stagnation where environmental policy is often opposed by businesses or citizens on social grounds (environmental rules are often accused in the public debate of being “job-killers”).

One way to represent specific social-ecological trade-offs, and the ways social-ecological policies can try to overcome them, is to use a social-ecological matrix (see figure).

Social-ecological trade-offs and policies



Reading:

Social-ecological trade-offs

Social-ecological policies

Source: Laurent, 2014a.

Each quadrant represents a combined assessment of the social and environmental outcome of a given situation or policy. In the top left quadrant, fuel poverty (see note xxi for two possible

definitions) results both in monetary poverty and energy over-consumption. Thermal insulation (home weatherization) allows for a reduction in energy consumption (and thus lower related greenhouse gas emissions, triggering environmental improvement), which translates into lower expenditure devoted to energy by fuel poor households, allowing for social progress.

In the top right quadrant, carbon taxation without social compensation is both socially regressive, as it hurts the poorest more because of their higher income share devoted to energy consumption, and environmentally efficient, because it reduces greenhouse emissions by pricing carbon. Introducing social compensation based on income level but also location (rural areas versus urban areas, suburban areas vs. urban centers, etc.) maintains the environmental efficiency of the policy measure (compensation should not be understood as exoneration), but eases its social impact and therefore its political acceptability.

Finally, the bottom left quadrant takes the example of cost-benefit analysis (CBA) applied to infrastructure projects, for instance housing. When biodiversity and ecosystems services impacts are not or only partially taken into consideration in CBA, building a residential complex on a wetland increases human well-being while at the same time destroying ecosystems and biodiversity. The social-ecological policy in this case is conceptual: it consists in changing indicators used to decide or not to implement the policy by integrating the social value of ecosystems and biodiversity. When a correct assessment based on comprehensive wealth analysis including benefits derived from natural capital is carried out, the infrastructure project will be moved to a better/less harmful location, resulting in both environmental and social progress.

These simple examples show how urban policy, tax policy and accounting policy can be re-designed to become social-ecological policies, in the context of a social-ecological approach reshaping the welfare state.

Conclusion: building institutions for the social-ecological transition

Going back to our starting point, two “operational” considerations seem to be missing from the legitimate concern expressed by the environmental community regarding our worsening ecological crises.

The first one is the general notion that transitions don’t “leapfrog” over the dark present to the desirable future: they need to rely on institutions to happen. The history of social transitions indeed highlights the role of institutions as engines of accepted change. Institutions are the central dynamic elements of any human transition because their very purpose is to facilitate social cooperation in time. What we have come to call “industrial revolutions” were primarily institutional revolutions, from the introduction of stable property rights in the 19th century to labor contracts and social protection in the 20th century. Empirical studies confirm that beyond geography or trade, institutions are the key drivers of human development and social change. Addressing our ecological crises is therefore a problem more practical than moral: what kind of institutions do we need to sustain the transition toward a world where our life support system is preserved and not systematically destroyed?

In order to build those institutions, we have to recognize the social dimension of environmental challenges and crises and the role inequality plays on both sides of the social-ecological nexus. Approaching environmental issues along the logic of social justice may help, according to the distinction made by Dobson (2003), changing attitudes and not only behaviors. This is precisely the second missing operational element, or better yet missing link, in the environmental discourse developed in the last four decades or so.

As this paper has argued, social-ecological policies, forming the core of a new “dynamic welfare state” (including sustainability understood as the projection of welfare in time, or “dynamic welfare”) might well be the kind of institutions able to combine environmental and social progress needed for our century.

The social-ecological nexus agenda essentially proposes to move away from “environmental morality” in order to make progress towards ecological safety: It suggests that ecology as a scientific discipline and political movement should not be devoted to blaming humans for their insults and injuries to Nature but focus on protecting them from the unfair consequence of their improvidence.

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ⁱ For example, a March 2009 Gallup survey found for the first time in three decades that Americans prioritized economic growth over environmental protection. In the last poll (2012), 48% of respondents gave the priority to economic growth over environment protection while 43% stated the opposite; in 1990, these proportions were respectively 19% vs. 71%, and in 2007, still 37% vs. 55%. Dennis Jacobe, "Americans Still Prioritize Economic Growth Over Environment", March 29, 2012, Gallup.

ⁱⁱ This approach builds on the pioneering work of economists Elinor Ostrom (Ostrom, 1990) and James Boyce (2002, 2013).

ⁱⁱⁱ Bourguignon, 2012.

^{iv} Relative inequality, measured for instance by the Gini coefficient, has nevertheless almost doubled in China since 1978.

^v See TEEB, 2011 and Barrett, Travis and Dasgupta, 2011

^{vi} World Bank, 2010

^{vii} Paul Krugman, "For Richer," *The New York Times Magazine*, 20 October 2002.

^{viii} Absolute decoupling of GDP growth and CO2 emissions has actually been achieved in a number of countries over certain periods of time, but only on the basis of production or territorial emissions. Once the global ecological impact of their economic development is taken into account (i.e. “net decoupling”), only relative decoupling remains.

^{ix} WWF, 2012.

^x See Peters, et al, 2011 and Laurent, 2011

^{xi} Richard Wilkinson and Michael Marmot can be credited for opening this avenue of research, now widely pursued in governmental and international institutions

^{xii} See studies from the WHO on “preventable burden” of diseases, especially Prüss-Üstün and Corvalán (2006) and also Margai (2010).

^{xiii} Baland J-M. and Platteau J-P (1997); Klooster (2000).

^{xiv} See for instance Andersson and Agrawal (2011).

^{xv} McCarty, Poole and Rosenthal (2008)

^{xvi} Bechtel and Scheve (2013).

^{xvii} Serret and Johnstone, 2006.

^{xviii} Laurent, 2010.

^{xix} In the UK, a household is said to be fuel poor if it needs to spend more than 10% of its income on fuel to maintain a satisfactory heating regime, usually 21 degrees for the main living area, and 18 degrees for other occupied rooms. Under a new, alternative, definition, a household is said to be in fuel poverty if it “has required fuel costs that are above average (the national median level) and if, were they spend to that amount, they would be left with a residual income below the official poverty line” (Fuel Poverty Statistics, Department of Energy and Climate Change, UK Government, September 2013).

^{xx} Laurent, 2011b.

^{xxi} See, for instance, Pastor, Morello-Frosch, and Sadd, 2006.

^{xxii} African-Americans are 52 % more likely than whites to live in exposed neighbourhoods, Asians 32%, and Hispanics 21 %, see Jesdale, Morello-Frosch and Cushing, 2013.