



3rd International Conference on

ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT IN DEVELOPING AND TRANSITION ECONOMIES

With a pre-conference on Climate mitigation policies in developing countries



CERDI - CLERMONT-FERRAND OCTOBER 08 - 10, 2014

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3rd International Conference:
Environment and natural resources management in developing and transition economies
with a pre-conference on climate mitigation policies in developing countries
CERDI - 8-10- October 2014

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Is green growth relevant for poor economies?

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- The conceptual framework of green growth
- Green growth, sustainable development and poor economies
- The key stylized facts of natural resource use and poverty in poor economies
- Is green growth good for the poor?
- Climate change mitigation policies and poverty
- A policy strategy for green growth in poor economies

Climate Change and Economic Development

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Is REDD+ a good idea impossible to implement?

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REDD+ has been modified since it was launched in 2007, and risk losing the original idea of paying for reduced emissions (PES). Why? Well, partly for political economy reasons, but also because the PES idea is very challenging to implement. Still, the idea of paying for performance has survived, and remains a key element in both REDD+ projects and national programmes, although the systems being planned and implemented are far from the recipe of the environmental economics textbooks. The main question is how well will a third or fourth best solution work? We still don't know the answer to that.

Lessons from the CDM for the design of new mitigation policy instruments involving developing countries

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Pricing Carbon in An emerging Economy: The road to Paris for Chile

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As part of a much broader tax reform recently sent to Congress, Chile's newly elected president is proposing a tax of 5 US\$/ton over CO₂ emissions from power plants of 50 MW and above and other large facilities, which add approximately to a third of the country's CO₂ emissions. Despite the effect of this tax, in case it is approved, is not that large in terms of emission reductions and electricity price increases (10% and 2%, respectively, by 2030), it is a crucial first step towards building the institutional capabilities the country will require in the future as we engage in more ambitious reduction goals including the transition to a broader cap-and-trade system. We discuss the challenges for the implementation of such cap-and-trade system borrowing from international experience but also paying attention to elements specific to an emerging economy

Economic instruments and the 2015 Paris Climate Conference: the catalyst of carbon pricing

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Cutting the Gordian Knot Economic Development and Climate Policy

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DDPP ? Deep Decarbonization Pathway Project

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Farmers' Preferences for Eco-Friendly Nets as an Alternative to Insecticides in Africa

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Vegetable production in Africa is highly dependent on pesticides with a large proportion of the population involved in farming. We investigate if eco-friendly nets (EFNs) are a viable and accepted alternative to farmer's current practice of extreme use of insecticides in vegetable production. Using a choice experiment, we found that farmers in Benin preferred all of the characteristics of EFNs except the higher labor requirements. The break-even point can vary with the lifespan of EFNs, their purchase price and potential health benefits from avoiding large quantities of insecticides. To break even the nets need to be used for at least two production cycles. To overcome risk-averse farmer's reluctance to adopt EFNs we propose a credit and warranty scheme along with the purchase of the nets. The study's findings can guide the implementation of EFNs in other African countries as part of integrated pest management with global benefits for the environment and health by reducing the use of pesticides.

Determinants of agricultural land values in Argentina

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In the context of the rapid development of the cultivation of genetically modified soybeans in Argentina, we conduct a hedonic analysis of agricultural land values. The main objective is to evaluate the impact of land tenure systems and agricultural practices on these values. Data on 338 parcels, located in the Pampas region, are analyzed. The tenure appears to be a particularly important variable. We find that plots rented either by physical persons or by companies are negatively valued in relation to plots owned. Results also highlight the importance, though not to a large degree, of a diversified cropping pattern compared to soybean monoculture. Soil quality, location of the plots, distance to markets, as well as to the nearest city, were also found to affect land values.

Rain and Impatience: Climatic Factors and Investment in Soil Conservation

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This paper investigates the role of impatience on investment in soil conservation in the degraded lands of Ethiopia. We combine farm household panel data, farm specific weather data, and subjective rate of time preferences measured by an experiment conducted in two different points in time. We find that lower rainfall increases farmers' elicited impatience and via this channel reduces effort in soil conservation. We also provide field evidence that impatience measures are sensitive to weather conditions. Elicited behavioural parameters respond to climatic factors.

Agricultural Risk and Remittances: The case of Uganda

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The economic literature showed that remittances could replace missing credit and insurance markets. As a result, it is natural to expect that higher amounts of remittances will motivate agricultural farmers to engage in riskier activities. The present study aims to verify the latter hypothesis by answering two distinct questions: do households that receive higher remittances choose to cultivate a riskier crop portfolio; do households that receive higher remittances choose to engage either in crop specialization or in crop diversification? I use the Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) dataset on Uganda established by the World Bank to test these hypotheses. The results show that remittances have no significant impact on farmers' risk decisions in terms of crop portfolio and crop diversification. There is some evidence that credit constrained households that receive remittances engage in crop specialisation, which can be interpreted as a wealth effect.

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Climate Variability and Migration. Evidence from Tanzania.

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We analyze whether Tanzanian households engage in internal migration as a response to weather-related shocks. Our findings confirm that climate shocks lead to a higher probability of migration by reducing agricultural yields, which in turn induces households to send their members away in order to spatially diversify their income. This effect is, however, low, since a 1% reduction in agricultural income induced by weather shock increases the probability of migration by 3% for an average household. What is more, such mechanism is valid only for households whose income is highly dependent on agriculture, but is not significant for diversified livelihoods.

Weather Insurance: Economic Adaptation to Climate Change in Israel

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The Climate change phenomenon is considered as one of the main risks that could affect global socio-economic system and the insurance industry in particular. This study examined weather insurance as an economic adaptation measure to cope with climate change in the medium-long term by 2030 and for longer term by 2050. The research is based on a unique insurance market model and integrates both the CGE model and econometric estimation.

The main findings indicate that a change of 1°C maximum average temperature in Israel is expected to cause an increase of 3.8% in insurance industry expenditures. Since the average temperature in Israel is expected to increase by 0.4-0.8°C in a decade, the increase in insurance expenditures until 2030 is expected to rise by about 5-8% and by 9-15% until 2050. The expected increase in insurance prices in 2030 is by 2%, with a decrease in employment and quantity of 0.5% and a significant decrease in consumption of 2.5%.

In terms of the impact on GDP, it is expected to decrease by 0.1%. However, if the effect on the insurance industry grows, a significant change of about 0.9-1.3% is expected with significant impact on the Israeli economy.

Should landowners oppose climate change mitigation? ?

A general equilibrium analysis of damages on land.

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We model the impact of climate change damages on the land rent and price, and assess the consequences for inter-generational distribution. In our conceptual model, we derive the impact on today's price of a long-lived asset, called land, in response to future changes in the productivity of land in general equilibrium, including the interaction with capital accumulation. We find, first, that the price can move in either direction in response to damages. Second, the welfare impact on generations alive today is determined by the change in the price of land. Depending on the direction of the price change, mitigation of these damages can be a Pareto-improvement, or lead to inter-generational conflict between generations. In developing countries, future damages can benefit today's owners of land through rising prices, causing an inter-generational distributional conflict.

A spatial econometric approach to spillover effects between protected areas and deforestation in the Brazilian Amazon

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Protected areas are increasingly used as a tool to fight against deforestation. This paper presents new evidence on the spillover effects that occur in the decision to deforest and the creation of protected areas in local administrative entities in Brazilian Legal Amazon over the 2001-2011 period. In order to take into account the interdependence between the decision to deforest and the creation of protected areas, we use a simultaneous system of spatially interrelated cross sectional equations.

Empirical estimates allowed highlighting feedback simultaneities effects among deforestation and protected areas. In addition we show that deforestation decisions are strategic complements while protected areas are strategic substitutes. We also find that the establishment of integral protected areas allows reducing deforestation even in the presence of spatial interactions. In terms of economic policy, these results militate for an extension of integral protection areas.

We also find interdependence between deforestation and sustainable use areas suggesting a simultaneous positive feedback effect among these. This result suggests implementing a reinforcement of the management of these areas so that they have the desired impact on deforestation.

Development and biodiversity conservation in Sub-Saharan Africa: A spatial analysis

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The current study seeks to provide a sound analysis of the relationship between economic development and biodiversity loss in Sub-Saharan African countries. The motivation is that a better understanding of the impact of economic development on biodiversity loss is of great relevance, given the current rapid extinction of species along with challenges born from the context of economic development in poor countries. The analysis draws on the most up-to-date data on threatened species from 48 sub-Saharan African countries. Assuming that spatial autocorrelation is a typical problem for biodiversity data, we use Maximum-likelihood estimators to account for spatial-autoregressiveness in the dependent variable, as well as in the explanatory variables of the models. We find evidence that supports a decrease of biodiversity loss, measured as the percent of threatened bird species, with increasing income per capita. The results also reveal some species-level differences in the biodiversity-development relationship, since we find no significant impact of economic development measured as per capita income on threatened mammal species. This analysis contributes to the literature by partially challenging the paradigm of a strictly positive relationship between biodiversity loss and economic growth in a developing countries context.

Spatial Analysis of Amazonian Deforestation: Complementarity or Substitutability?

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This paper investigates the mechanisms determining spatial interactions in deforestation, using data from the Brazil. Our preliminary results confirm the hypothesis that deforestation in the Brazilian Amazon is characterized by complementarity, meaning that deforestation in a particular commune tends to increase deforestation in its neighbors. We further show that cattle density, lower access to credit and lower paved roads density tend to be the most important factors determining the nature of spatial interactions between neighboring areas.

Political Violence and Greenfield Foreign Direct Investment in Natural Resources

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In this paper the heterogeneous effect of political violence on Greenfield Foreign Direct Investment is examined. It is hypothesized that political violence reduces overall FDI inflows, as violence increases uncertainty and operating. In addition, we hypothesize that FDI in the natural resource sector is less sensitive to political violence than FDI in for example manufacturing and services, since MNEs active in the natural resource sector are more restricted in their location choice and the economic rents and first-mover advantages associated with natural resource extraction can offset the negative effects of political violence on profits. Finally, FDI flowing into the oil and gas sector is hypothesized to be less negatively affected by political violence than FDI in other natural resources, as oil and gas extraction is associated with exceptionally high resource rent and relatively low sunk cost, and extraction can often take place off-shore shielded from most political violence. Exploiting a new dataset on greenfield investments flowing to 84 developing countries, we find support for the first and third hypothesis.

Why Institutions May MATter Even More

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The effect of institutional quality on national savings is examined. Institutional quality is assumed to determine the (perceived) risk in face of which oil and mining firms decide on their level of investment in physical and natural capital. Since these two types of capital are used jointly in the industry's production process, the firms face a dual investment decision, where they have to decide on the investment into both types of capital simultaneously. It is shown that this production structure implies that better institutional quality can increase as well as decrease the speed of resource extraction. However, this fact has so far not been adequately accounted for in the empirical literature, due to the structure of national accounting data. By connecting the dual investment model to the green accounting approach we show that the form of capital aggregation in national accounting can lead to an underestimation of the effect of institutional quality on national saving and subsequently on economic growth. The availability of green national accounting data enables us to modify the capital aggregates in line with the dual investment model in order to assess the mechanisms predicted by the model. The results suggest that the predicted effect is indeed likely to be present in the data. This implies that improving (aspects of) institutional quality may be even more important for saving than previously suggested.

What about the weather? Climate as a determinant of investments and revenues of foreign manufacturing companies in Russian regions

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Globalization and climate change have been among the hottest academic topics during the past couple of decades. However, in academic research the links between the two is virtually untouched. In this paper, we study the impacts of climatic factors on foreign manufacturing companies in Russia. In particular, we analyze how short-term weather affects their revenues and how average climate impacts the manufacturing foreign direct investment (FDI) distribution across Russian regions. We find quite strong evidence that higher precipitation and temperature during summer is positively associated with annual fluctuations of foreign companies' revenues. We also find that manufacturing FDI in Russia tend to accumulate to regions with milder and stable climate, i.e. to regions with warmer winter and cooler summer and less weather volatility.

Baseline Choice and Performance Implications for REDD

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The significant contribution of deforestation to global greenhouse gas emissions has justified the emergence of new schemes (REDD, REDD+), which offer carbon payments in exchange for reductions in deforestation below business-as-usual levels. An important aspect of REDD implementation is the choice of the baseline, the deforestation level against which reductions are measured. We solve a dynamic model of land conversion in the presence of REDD, in order to specifically assess the impact of four baseline types on deforestation levels and REDD performance.

We find that none of the analyzed baselines stands out in terms of all performance indicators considered simultaneously, and that the final baseline choice will reflect the trade-off between the economic and environmental goals of REDD. We argue that the so-called variable corridor 2, a dynamic baseline approach whose bounds form a corridor around the business-as-usual deforestation rate, is the overall top performer, offering the best trade-off between cost-efficiency, welfare increases, and effectiveness in reducing deforestation. Moreover, we show that specific baseline attributes, like corridor wideness and symmetry, influence REDD success.

Literature review of Payments for Environmental Services evaluation

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Positive economic incentives have been increasingly used as a policy tool for dealing with environmental issues and more specifically the provision of environmental services (ES). As Payments for Environmental Services (PES) is said to be more efficient than indirect payments (Engel, Pagiola et al. 2008), it is not surprising if a significant portion of scientific papers on PES are evaluation studies. What is more surprising is the fact that there is no attempt to define coherent methodological frameworks for PES assessment. This paper is an economic literature review of PES evaluation in the developing countries, in aiming to building a transversal analytical framework for the evaluation of PES. This study propose a typology of PES evaluations contributes to: (i) identify the large diversity of PES evaluations questions and methods used; (ii) classify PES evaluations according to the specific stages of the PES project lifecycle (ex-ante, monitoring, ex-post); and (iii) better understand complexity of overall coherence of PES evaluations and to analyse relationships between them. Finally we notice an increasing complexity of research evaluation questions and subsequent methods.

Economic Incentives for Climate Change Mitigation: An Analysis of Factors Affecting Household Willingness to Participate in the REDD+ program

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Tanzania has been listed as one of the countries with high rates of deforestation and forest degradation. Reducing deforestation and forest degradation is an important strategy for reducing greenhouse gas emissions. However, asking households to reduce deforestation means asking them to sacrifice important direct benefits they get from forests, such as daily energy resources. The REDD+ program provides a way in which to compensate households. This study estimates households' willingness to accept forest use restrictions governing participation in the REDD+ program and its determinants. The results show that households will participate in REDD+ if the program can compensate them with an average of USD 2072 per year. The determinants of willingness to participate are analysed using the Heckman sample selection model. The results reveal that awareness about REDD+ economic incentives, awareness that deforestation and forest degradation is not good for the environment, and increase in time used to collect the most important forest products increases the households' probability of participation in the program. Households that earn more from forest products demand more financial incentive to participate. The results further reveal that, once the household that is aware of the program and its incentives decides to participate in the program they tend to demand less compensation. In this case, the Government of Tanzania is advised to (i) collect baseline data in order to differentiate incentives for households depending on their forest reliance, (ii) educate people about the relationship between REDD+ and climate change to increase the cooperation of the communities.

REDD+ as a Tool for Climate Change Mitigation and Biodiversity Conservation: Co-Benefits and Trade-Offs under Moral Hazard

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Climate change mitigation through reduced deforestation and afforestation can entail biodiversity conservation as a co-benefit. However in some cases this co-benefit may be lower than usually argued. This paper aims at theoretically comparing the Reducing Emissions from Deforestation and Forest Degradation + (REDD+) scheme dedicated primarily to carbon emission reduction with another kind of contracts that would focus on biodiversity preservation. Biodiversity is modelled as a stochastic variable resulting from the non-observable efforts for reducing deforestation and intensifying afforestation density. The forest cover's components and the carbon density are observable ex-post. We define the contractual relationship between a developed country and a developing deforesting country in the light of the theory of incentives, with a multi-task principal-agent model under moral hazard. We compare two types of contracts: a carbon density performance-based contract and a biodiversity conservation-based contract. Because of the substitutability between the possible efforts and between the different kinds of forests, and their different biodiversity content, each kind of contract may imply different choices of reduced deforestation and afforestation efforts and different outcomes on forest coverage and biodiversity.

Does EU environmental stringency benefit to East-European polluting industries?

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Air pollution is a particularly acute issue for emerging and developing countries of Europe and Central Asia (ECA). Many of the region's countries are among the most carbon-intensive exporters in the world (Davis and Caldera, 2010). Whereas their main trading partner (e.g. European Union) have made increasing efforts to protect environment by adopting stricter environmental regulations. These regulations may have raised the relative cost of pollution intensive activity inside the EU, thus affecting relative competitiveness of polluting sector outside the EU. Thus, we test in this paper whether tighter EU environmental regulation fosters pollution havens in ECA countries. By making an assumption on which sectors are more affected by environmental regulation, we provide robust evidence that ECA polluting industries benefit from EU environmental stringency. Moreover, we propose an original and relevant variable that evaluates environmental regulation stringency and limits simultaneity issues, based on EU Air Quality Framework Directive. Finally, the use of a wide range of fixed effects and instrumental variable approach control for potential bias due to omitted variables and reverse causality.

Do Environmental Policies Hurt Trade Performance

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This paper contributes to the controversial literature on the relationship between environmental policies and international trade. It provides new evidence about the effect of a gap in environmental policies between trading partners on bilateral trade flow on a sample of developed and developing countries over the 1980-2010 period. The paper innovates on two aspects. First, while previous studies have used partial measures of environmental regulations (input-oriented or output-oriented indicators), an index of a country's environmental policy is computed. This index is calculated as the difference between observed pollution levels and «structural» pollution i.e. pollution predicted by determinants of environmental degradation as identified and modelled in the literature. This index is therefore a measure of «revealed» efforts made by countries aiming at downsizing environmental degradation. Second, the effect of these revealed environmental policies is assessed on bilateral trade flows in a gravity model. Our results show that a gap in domestic efforts towards environmental protection between trading partners has no effect on trade flows. Moreover, the results do not appear to be conditional on the level of development of the countries trading nor on the characteristics of exported goods (manufactured goods and primary commodities).

The "windfall profits 2.0" during the third phase of EU-ETS

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The first two phases of the EU-ETS were characterized by a profit increase, which was primarily due to free allowances given through grandfathering. To avoid these windfall profits and to decrease leakage, two major modifications have been implemented for the third phase: electric companies no longer receive free allowances, while energy intensive and trade exposed sectors are granted free allowances that are calculated based on firm output. This paper theoretically shows a new type of profit increase in sectors that are not exposed to international competition. This paper also numerically determines the order of magnitude of the profit increase for the third phase of the EU-ETS and shows that profits in the electricity sector may increase by approximately 1.5% when free allowances are given to the other sectors.

How to match water cost recovery, incitation to water savings and water access? State of the art of solutions adopted in Southern Mediterranean countries

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Southern Mediterranean countries are characterized by water scarcity and poverty. Therefore, water authorities have always been facing a high challenge, which consists of trying to reach at the same time three main objectives: sharing scarce water in an efficient way, balancing water budget and giving an access to water to all.

This communication aims to overview in the first part the different ways available to reach these three objectives. The second part presents the way followed in many Southern Mediterranean countries to reach them: the use of a unique instrument (water pricing). The conclusion discusses on the result of such a policy to meet this fixed targets.

The redistributive effects of the energy transition between electric and metal sectors

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The rare earth elements crisis has underlined a major geopolitical issue but also highlights the crucial dependency of metals to green energies. In parallel to this event, many international reports and academic studies have brought the evidence of a highest metal intensity of green energies in comparison to traditional energies. This paper explores the consequences stemming from the reinforcement of the link between energy sector and metal sector as a result of the energy transition. In a first time, we show with models of simulation calibrated on real data that energy transition could redistribute emission of CO₂ between electric sector and metal sector but also create a new global geography of CO₂ emission. In a second time, we discuss the potential effects of energy transition on the sharing of energy rents and offer to identify winners and losers resulting from this new distribution. Finally, in a third time, this paper emphasizes that the reinforcement of the interdependency between energy and metals includes fairly substantial risks, not only because it increase the sensitiveness of the energy price to the price of metals, but also because it makes the system more vulnerable and volatile in face of exogenous price shocks.

De-risking concentrated solar power in emerging markets: the role of public finance institutions

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Concentrated solar power (CSP) is a promising energy technology for low-carbon energy systems, as in combination with thermal storage it can store solar energy in the form of heat and can therefore deliver clean power more flexibly. However, its high cost - the financial viability gap - is a significant barrier to its rapid deployment. International financial institutions (IFI) have emerged as key public players to enable CSP in emerging economies, especially when cooperating with national policymakers. Through the analysis of two CSP plants in India and Morocco where IFI provided the lion's share of finance, this paper aims at understanding the effectiveness of their support and estimate the impact of IFI financing on the electricity production costs and the mobilization of private investments. The two case studies show that public financial institutions can have a significant role in reducing the weight of CSP support on public budgets by providing concessional loans in countries where private finance would be too expensive or extending maturities in those markets in which commercial investors are present but poorly suited for project finance. Finally, we show that, when combined with competitive tariff setting mechanism (eg. tenders and auctions), public financial support can also be a cost-effective tool to engage private investors in CSP

Does energy consumption stimulate economic growth? Empirical evidence for Emerging European countries

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Abstract for thematic sessions of the Conference:

The paper examines whether energy consumption stimulates economic growth or vice versa in the case of 10 Emerging European countries. The analysis is performed over the period 1990-2013 and uses dynamic panel estimation techniques, including the Pooled Mean Group estimator (Pesaran and Smith, 1995; Pesaran, Shin and Smith, 1999). Compared to the traditional literature on dynamic panels, these techniques allow estimating a different slope parameter for each country and take into account the non-stationarity of variables when investigating the energy-income nexus. Findings reveal that there exists a long-run and a short-run causality from energy consumption to economic growth only in the case of pre-crisis period but a long-run and short-run causality from economic growth to energy consumption for all samples considered. These outcomes should be taken as evidence that the energy consumption is as a key input in the production function and that energy saving policy and efficiency improvement will favorably influence the GDP growth and emission reduction.

The impact of the biomass energy use on CO2 emissions: A Panel data model for 15 countries

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Biomass energy is a double-edged sword. There are two theories of the relationship between biomass and carbon dioxide (CO₂) emissions. Proponents of the first theory predict that biomass is carbon neutral, so that its use reduces CO₂ emissions. Supporters of the second theory argue that biomass can be harmful to the environment by emitting a significant amount of carbon. In this context, the current analysis investigates the relationship between biomass and carbon emissions for 15 countries during the period 1991-2011. This study uses one proxy of carbon emissions, namely (CO₂) and one proxy of biomass use, namely electricity generation produced from biomass and waste energy (BIO). Using the Panel data model, the results showed that the biomass reduces the CO₂ emissions and has a positive role in the reduction of the carbon. The researchers also concluded that there is non-linear relationship between the level of growth expressed by the real gross domestic product (GDP) and the CO₂. Finally, the population is positively correlated with the CO₂ emissions.

An Investigation of Oil Curse in OECD and Non-OECD Oil Exporting Economies Using Green Measures of Income

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This paper employs the Arellano-Bond difference GMM method in investigating the oil curse in OECD and Non-OECD oil exporting countries. Empirical studies investigating the natural resource curse theory mostly employ cross-country and panel regression techniques subject to endogeneity problems. Also, most of these studies employ GDP in its aggregate or per-capita terms as the outcome variable in their analyses. However, the use of GDP measures of income for resource curse investigations does not portray the true incomes of resource intensive economies. Standard national accounts treat natural resource rents as a positive contribution to income without making a corresponding adjustment for the value of depleted natural resource stock. This treatment, inconsistent with green national accounting, leads to a positive bias in the national income computations of resource rich economies. Our paper deviates from most empirical studies in the literature by using the Arellano-Bond difference GMM method. We test the robustness of the curse in the predominantly used measures of national income, GDP, by investigating the theme in genuine income measures of economic output as well. We employ two alternative measures of resource intensity in our explorations: the share of oil rents in GDP and per-capita oil reserves. Our results provide evidence of the curse in Non-OECD countries employing aggregate and per-capita measures of genuine income. On the other hand, we find oil abundance to be a blessing rather than a curse to the OECD countries in our sample.

The Sustainability of Peruvian Mining: A Hotellian Approach

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Hotelling's theory (1931) provides a framework for measuring mineral depletion (MD), which is more rene and closer to the complexity of mining itself. In this article we estimate a multi-product translog cost function for mining in Peru

over the period of 2000{2008 by separating the production of polymetallic (copper, lead, iron, tin, and zinc) and precious (gold and silver) metals in order to estimate the Hotelling rent and thereby to assess the sustainability of mining in Peru.

Here we present cost-share measurements for three major activity inputs: the cost-share for human capital through remuneration, the cost-share for energy via electricity consumption, and the cost-share of xed assets by investment in xed capital. We also estimate the elasticity of input substitutions, cost exhibity and marginal costs. Finally, the estimated marginal costs allow us to estimate the Hotelling rent per company and also to assess the sustainability of each mining company.

We were able to acquire a MD measurement of around 7% of the GDP, nearly double the approximation given by the World Bank. Van der Ploeg and Poelhekke (2010) highlight dierent problems in the methodology of the World

Bank, which does not take into account the particularities of resource-rich countries.

Our results show that mining revenues fall short of compensating for mineral depletion, but also that these revenues

are not reasonably reinvested. This situation emphasizes the non-sustainability of Peruvian mining. Hartwick's rule

(1977) is not respected for the analyzed periods. Peru is losing more wealth than it creates.

Differential games approach to trade with exhaustible resources

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This paper presents the model of two countries world economy in which one of the countries extracts the exhaustible resource and both countries compete at the final goods market. We demonstrate how opening up trade of the exhaustible resource may be beneficial for the economy of the home country by promoting technical change and capital accumulation in it. For this we consider a dynamic duopoly of foreign and home producers together with dynamic optimal resource extraction in the international trade framework.

Trust and the Willingness to Contribute to Environmental Good in Selected African Countries

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Using data from the World Value Survey for the period 1981 to 2007, this paper shows that the level of trust is positively linked to the willingness to contribute to environmental good in selected African countries. The results are robust to possible errors in measuring trust, to the presence of various controls, and the potential endogeneity bias. These findings complement and extend the existing literature in the sense that they provide evidence on the importance of trust in improving the collective management of natural resources in Africa.

Spatial heterogeneity and transboundary pollution in a cross drainage basin: a contingent valuation study on the Xijiang River drainage basin of southern China

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This article aims to examine whether and how the location of a city along a river may affect resident's Willingness to Pay (WTP) for a river water quality improvement project. The underlying mechanism that may decrease WTP is transboundary river water pollution spillover, which can lower resident's expectation of the utility of cleaner water. Our analysis is based on a CVM survey conducted from July to August of 2012 in 20 cities across four provinces of southern China that are located in the Xijiang river basin. To test this hypothesis, the water quality of the segment of the Xijiang River belonging to an upstream city is included in the WTP determination function for a respondent living in the corresponding downstream city. Our results demonstrate that in addition to city-specific river water quality and other macroeconomic variables, the water quality of the upstream city is a significant and negative determinant of WTP values. Downstream city respondents report lower WTP when the water quality in the city immediately upstream is more heavily polluted. We also found that negative externality on downstream city WTP decrease as the distance between cities adjacent to one another along the river grows. This negative externality is also found to be mitigated by the negotiation power of a downstream city in relation to its direct upstream counter-partner. Our results reveal that a higher level of negotiation power for the downstream city (measured by the relative ratio of per capita gross regional product (GRP), GRP growth rate or population size) correlates with lower negative externality of transboundary pollution effects on WTP. The under-reported WTP values that have resulted from transboundary river pollution demonstrate the considerable potential social benefits that can be enjoyed through the establishment of a river basin-level water quality management project. When such programs function efficiently, downstream population concerns of pollution spillovers from upstream cities are reduced considerably. Our study also provides useful insights into the significant potential of hotly debated pilot payments for ecological service regimes between upstream and downstream regions, which has been considered as a market-based solution for transboundary river water pollution control in China.

Estimating Stakeholder preferences over Wetland Attributes using Discrete Choice Experiments

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Wetlands provide a diverse goods and services, which have got immense economic value. However, these often got unaccounted in the traditional cost-benefit analysis framework. The main reason for this is, most of the goods and services that wetland generate are non-marketed and/or marketed in thin/distorted markets, hence do not have readily available market prices. This leads to advertent negligence from the part of the policy makers or the resource users about the importance of, these otherwise precious resources, leading to their depletion and degradation. The case study presented here is an example for such peri-urban wetlands, named Kol wetland, which is part of the largest Ramsar site located in India. Thousands of peri-urban and rural households rely on this wetland for irrigated farming (especially rice) and fishing for their livelihoods. It simultaneously provides recreational benefits for the urban society and act as a drainage plain during monsoon, precluding water logging in the area. Moreover, this wetland is of significant ecological value, being an important habitat of water fowls and migratory birds. Due to the expansion of urban area due to the growing population pressure, consequent reclamation of wetland for residential and industrial purposes, and the unsustainable farming and fishing practices undertaken by the peri-urban and rural populations, the wetland ecology is facing serious threat of degradation. In this study we employ a discrete choice experiment to estimate the economic values of changes in several ecological, social and economic goods and services provided by the Kol wetland. Random parameter logit model with socioeconomic interactions is estimated to identify the various stakeholders' preferences for the improvement in selected wetland attributes. The findings reveal that there exists considerable heterogeneity across stakeholder groups' preferences. On average, however, they derive positive and significant values from the improved conservation and management of this wetland.

External validity of WTP estimates: comparing preference and WTP-space model results

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We introduce a protocol for measuring the external validity of competing Willingness-To-Pay (WTP) distributions derived from Random Parameter models for a given set of Discrete Choice Experiment (DCE) data. This protocol is illustrated by comparing two recent advances in the field of choice modeling: the cost-income ratio in preference space approach and the willingness-to-pay space approach. The protocol is based on a two-round survey. Round one consists in a standard DCE survey at the end of which different competing models are estimated. Round two introduces new respondents from the same survey area. In addition to the DCE survey, these new respondents are asked to repeatedly choose, between a set of values randomly drawn from the competing models previously estimated, the one closest to their true preferences. Respondents finally state the interval that reflects their true preferences. An external validity criterion is then obtained by using a new non-parametric test based on the common area of kernel density estimates. Results indicate that 72% of the respondents prefer values from the willingness-to-pay space model. Moreover, test results indicate that the willingness-to-pay distribution derived from this model is 1.72 times closer to respondent's true preferences in comparison to the preference space model.

Deforestation, Leakage and Avoided Deforestation Policies: a Spatial Analysis

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Using a theoretical spatial model, this paper assesses the impact of avoided deforestation policies when there is spatial interdependence between different areas of forest. We show that spatially distributed heterogeneity in deforestation benefits, combined with spatial interaction between forest patches, drives the optimal location of protected zones, leakage, and costs of protection. With less spatial heterogeneity among forested areas, we show that agglomeration bonuses may be an effective tool in reducing leakage, while conservation areas may be more effective where there is more spatial heterogeneity. We also show that classic Payment for Environmental Services (PES) schemes tend to be the least cost options per area of avoided deforestation.

The dynamics of deforestation and reforestation in a developing economy

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Forest transition theory is often used to describe the long term evolution of forest cover in a country as it develops, yet previous theoretical work has considered only net forest cover change when describing deforestation. However, little work exists describing the dynamics involved in forest cover change, particularly the relationship between reductions in primary native forests commonly associated with deforestation and concomitant reforestation and establishment of secondary forest plantations. We examine this distinction and formulate a new forest transition hypothesis. Our approach recognizes that primary and secondary forests are imperfect substitutes in terms of ecosystem services, but also in the costs associated with securing tenure. The latter is important given the property rights insecurities that have led to deforestation in many tropical countries. Our model allows a study of both the length of a forest transition and the speed at which net forest depletion eventually ends in the long run. Understanding the forest transition as we describe it could be important for future climate change mitigation policies.

Worker Household Living Standards and Income Inequality in State Forest Areas of the Northeast China

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This study examines forces driving towards both income equality (i.e., workers get to utilize their comparative advantages) and inequality (i.e., those relatively disadvantaged workers and families can fall into further poverty), with informal innovations and market development in Northeast China's state forest areas. The severity of the latter trend merits serious scrutiny and could form the basis for determining future central government financial support to the region. We firstly aggregated consumer durables and housing values into the normal sources of income, on the basis of Milton Friedman (1957)'s Permanent Income Hypothesis, so as to provide a closer measurement for workers' real income level of livelihoods. The major methodology applied are the Lerman and Yizhaki (1985) decomposition method in order to extract information on a variety of major income categories/sources, and a regression-based approach in order to capture patterns of inequality. Samples are divided into two groups--mountain top- and mountain base-dwelling households. Our findings give visualized ideas on how percentage change in source of income influences the distribution of income, which are important policy issues and concerns.

Macroeconomic instability versus oil curse: an empirical assessment in oil exporting countries

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This paper tests empirically the Dutch disease macroeconomic dynamics in a set of oil exporting countries. Accordingly, this study was put forth to provide an assessment of the Dutch disease symptoms, by focusing on the link between macroeconomic instability indicators and economic growth. To this end, we assess the risk to real exchange rate, government spending and price stability from the oil incomes fluctuations and from the institutional weakness. Based on a gradual regime switching model, we examine some potential nonlinearities in the economic growth's responsiveness to macroeconomic instability within a Panel Smooth Transition regression model. Our findings highlight a strong worsening impact of real exchange appreciation, high public expenditures and price instability on economic growth. These effects are exacerbated in highly oil dependent countries via the Dutch disease mechanisms. However, these macroeconomic distortions could be reversed with an adequate policy response and more generally with good governance. Indeed, above a certain threshold of government effectiveness, the negative drawbacks from macroeconomic instability are lower.

Public debt, life expectancy and the environment

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This paper aims to provide policy recommendations to improve both environmental quality and growth in the context of debt consolidation. For that purpose, we develop an overlapping generation model in which we include public debt, and we modelize the two-way causality between life expectancy and the environment. We use a phase diagram to demonstrate the possibility of an environmental poverty trap. Using comparative statics around steady states, we find that a voluntary environmental policy may allow a country to escape the environmental poverty trap, or may help a country to reach a higher level of development. This paper also argues in favor of debt-for-nature swap mechanisms. Finally, by means of a welfare analysis, we find that public debt is a useful instrument to simultaneously solve the capital over-accumulation problem and reach environmental objectives, but it must be used with caution.

The Role of Trade in Carbon Leakage : Evidence from Spatial Economics Model

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The Kyoto Protocol on climate change obliges the industrialized countries to initiate the domestic effort of abating greenhouse gas (GHG) emissions. This initiative and the associated competitive effects may lead to significant relocation of developed countries' energy-intensive production toward the developing countries where the carbon emission has not yet been regulated, and therefore may lead to the so called « carbon leakage phenomenon ». Previous researches have provided numerous seemingly coherent evidences about the existence of the results of globe carbon leakage, presented in the terms of increase of surplus in balance of carbon embodied in trade of the key developing trade player such as China, Brazil etc., either via input-output methods or calculable general equilibrium models. However, until now, most of the papers that tried to analyze directly the causal relationship between trade and carbon mission from a cross-country international scale, only obtain relatively weak evidence about the possibility of carbon leakage. This paper proposes to employ a stylized spatial econometric model with trade related weighted matrix to detangle the potential causal relationship between the CO₂ emissions of different countries. We use a bilateral trade database of 56 countries during 2000-2009 to conduct our analysis and we find that 1) country-level carbon emission is positively and significantly affected by that of its export partners (peer effect?). 2) when the total export are broken into two different kinds: export of carbon intensive industries and export of other industries, the results show that trade of high carbon intensity industries plays a more significant role in affecting the pattern of carbon leakage between countries. 3) when the heterogeneity of trade pattern between OECD countries and Non-OECD countries has been taken into consideration, The results suggest that significant relocation of carbon dioxide away from the OECD countries toward non-OECD countries may occur, depending on the type of export structure.

Adaptation to Climate Change by Smallholder Farmers in Tanzania

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In Sub-Saharan Africa, climate change is set to hit agricultural sector the most severely and cause suffering particularly for smallholder farmers. To cushion themselves against potential welfare losses, smallholder farmers need to recognize the changes already taking place in their climate and undertake appropriate investments in adaptation. This study investigates whether smallholder farmers in Tanzania recognize climate change and, consequently, adapt to it in their agricultural activities. The study also investigates the factors influencing their choice of adaptation methods. To do this, the study analysed data from 534 randomly selected households in a sample of districts representing the six of the seven agro-ecological regions of the country. The data shows that Tanzanian smallholder farmers have observed changes in mean and variance precipitation and temperature and responded to it. The farmers have generally used short-season crops, drought-resistant crops, irrigation, changing planting dates and tree planting to adapt to the negative impacts of climate change on their agricultural yields. In this study selection bias is corrected using a Heckman sample selection model. A binary probit model is used as a selection equation to investigate the factors influencing a farmer's decision to undertake any adaptation at all to climate change while a multinomial probit model is used as an outcome equation to investigate the factors influencing farmers' choice of specific adaptation methods. The inverse Mill's ratio reported selection bias in choosing three of the adaptation methods. The study's findings suggest the Tanzanian government needs to help smallholder farmers overcome the constraints they face in attempts to adapt to climate change. The government can play a significant role by promoting adaptation methods appropriate for particular circumstances e.g. particular crops for different agro-ecological zones.

Prevention as adaptation measure against natural disasters in a non-cooperative game

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After an increasing number of floods in various European countries during recent years, the discussion about effective adaptation measures is of growing relevance. Prevention measures do not only have damage-reducing effects for the regions which enforce them, but also various effects on neighbouring regions, which may be viewed as an externality.

These externalities are analysed in the present paper. We model a non-cooperative and simultaneous game where two actors decide on prevention measures and analyse possible equilibriums dependent on the form of externality of the prevention measure. The individual decision as well as its influence on the other actor's effort crucially depends on the underlying externality of the prevention. Both positive and negative impacts of one's prevention effort on the prevention decision of the others are possible. In the case of a positive externality the prevention effort of one region provides particular protection for the other. In contrast, there is a negative externality if the prevention effort of one individual increases losses of others. Dominant strategies and possible equilibriums are represented analytically and explained dependent on the form of the prevention externality.

Smallholders and fire risk in the Brazilian Amazon: are mental models relevant to collective action?

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An increasing number of fires in the Brazilian Amazon forest are threatening the benefits of avoided deforestation and the livelihoods of local populations. Fires have a wide range of causes, but they are often related to the agricultural use of fire upon which most smallholders strongly depend. Fire control is a typical issue of collective action, since the effectiveness of fire control measures by one farmer also depends on his neighbours' decisions and actions to control fire. Existing policies address the fire problem mainly at the individual level by encouraging the adoption of alternative techniques, overlooking the importance of cooperation for successful risk mitigation. In this article, we propose a mental models approach to understand how they determine collective action. Farmers face an uncertain social and natural context, and the propensity to cooperate is likely to be affected by the way they frame risk and solutions. To explore farmers' mental models of fire control and the possible role of collective action, we interviewed key actors through semi-open interviews in conjunction with Q methodology. We identified four different shared mental models. They revealed diverging governance preferences depending on the perception of risk magnitude, responsibility and ability to mitigate risk. Identifying mental models may help determine important context-specific factors affecting cooperation, and consequently lead to the design of effective policies to promote collective action

Energy Use and CO2 Emissions in Manufacturing Industries: An Analysis Across Colombian Departments

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This paper determines the trends in energy use and CO2 emissions of the manufacturing industries across Colombian departments over the period 2005-2013, this empirical study examines energy efficiency and CO2 emissions based on two Malmquist data envelopment analysis model. The results show considerable variation in energy efficiency and CO2 emissions across Colombian departments. Results from the Malmquist data envelopment analysis model suggest that Colombian manufacturing industries have an excellent potential to improve energy use and reduce CO2 emissions and several manufacturing industries across Colombian departments have experienced gains in productivity, a growth in efficiency, a better balance between inputs and outputs and scale production and improvements in innovation through new technologies. Second-stage panel data techniques show that higher energy prices, exportations and productivity lead to higher energy efficiency and reduce CO2 emissions, while higher presence of energy intensive sectors and small and medium enterprises across Colombian departments reduce energy efficiency and increase CO2 emission. The findings of this study show that different energy policies should apply across Colombian departments and that they should encourage the importance of energy efficiency in order to improve it, especially in small and medium enterprises and energy intensive sectors.

Reduction in GHG Emissions through Sustainable production of biofuels: Is it a viable option?

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Depletion of fossil fuels at an alarming rate has attracted increasing attention to blending bio-fuels worldwide. India's energy demand is expected to grow at an annual rate of 4-5 times over the next couple of decades. With self sufficiency levels in crude oil becoming a distant dream, there is growing interest to look out for alternative fuels and the biofuels were an important option for policy makers. In this context, this paper reviews the experiences in India in the last two decades with respect to bio-fuels cultivation and its impact on land use, environment and impact on the livelihoods of rural communities. The baseline study was conducted during 2013 in the Madhya Pradesh state of India covering five districts and 333 sample farmers. In the last few years in India efforts are being made to produce bio-fuels from agricultural crops. However, the findings of the study indicate that use of major staple food crops such as Jowar and Bajra for biofuels production has long lasting impact on the food, fodder and nutritional security of millions of people and livestock in India.

CO₂ Emission Reduction Potential Assessment using Renewable energy in India

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Indian power sector experiencing a lot of pressure to supply sustainable electricity at affordable cost due to heavy demand especially in summer peak season. Most of the electricity is produced by fossil fueled power plants which is the source of CO₂ emissions. In this case renewable energy source play a vital role to secure sustainable energy without environmental emissions. This paper examines the effects of renewable energy use in electricity supply system and estimates the CO₂ emissions by developing various scenarios under least cost approach. LEAP energy model is used to develop scenarios. The results shows that in accelerated renewable energy technology (ARET) scenario 23% electricity generated by renewables only and 74% CO₂ reduction is possible in 2050. If integrated the maximum energy savings potential with ARET scenario the share of electricity rises to 36 % as compared to reference scenario and CO₂ emission reduction is remain 74% in this case.

Does better forest common's management crowd out rural saving? Forest commons and livestock holding in Ethiopian villages

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Although recent literature has provided evidence on welfare and distributional outcomes of forest tenure reforms, paucity still remain regarding the implications of such reforms on household's investment behaviour, specifically in relation to its effect on investments in productive assets. In this paper, we evaluate the impact of a Joint Forest Management (JFM) on productive asset holding among forest-using households in Ethiopia. Exploiting variation in ethnic composition and perception of customary right across community using selected forest for intervention as an instrument, we identify the impact of Ethiopian JFM on livestock holding. We also employed alternative identification strategies including propensity score matching and difference-in-difference (DID) to test robustness of our result. The data we used for the analysis was collected from the selected villages in Gimbo district, in south western Ethiopia. Our results show strong evidence that participation in JFM, augmented by NTFP marketing, crowded out livestock asset holding and that result was robust to various specifications.

Rent-seeking with endogenously determined common-pool size: an experiment on participation rights

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RENT-SEEKING WITH ENDOGENOUSLY DETERMINED COMMON-POOL SIZE - AN EXPERIMENT ON PARTICIPATION RIGHTS: We analyze an institutionalized rent-seeking game in which groups can endogenously choose the prize at stake, e.g. a common-pool resource. In the first stage, groups determine how much of the resource to protect and equally share. In the second stage, the unprotected fraction is competed for in a rent-seeking game. We consider two institutions varying in the extent by which subjects participate: majority voting (i.e. unrestrained participation where all group members participate in the protection stage) and dictatorial rule (i.e. limited participation where only one member decides in the protection stage). When subjects' participation rights are without limitation, rent-seeking is significantly mitigated by protection. This is especially true when the resource at stake is high. Meanwhile, when only one member selects the protection level, groups are sometimes worse off than when protection is exogenously imposed by the experimenter. These differences in group rent-seeking can be explained by subjects' individual behavior in the first stage. Dictators' protection preferences reflect self-interest, e.g. competitive intentions in rent-seeking. In contrast, subjects participating in a majority vote are concerned with group interest and are more likely to select stronger protection.

Scarcity and Antisocial Behavior

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This paper examines whether exposure to persistent resource scarcity on the commons affects pastoralists' readiness to engage in antisocial behavior towards their fellow commons users. The region under study is divided into two areas according to exogenous variations in biomass production stemming from geological peculiarities. We conducted a joy-of-destruction game with pastoralists from both areas and provide evidence for a positive relationship between antisocial behavior and long-term exposure to scarcity. Antisocial behavior among villagers occurs twice as often in an area where resources are scarcer and competitive pressure is higher. Our results remain robust to the inclusion of various controls, including beliefs, socio-demographics, absolute and relative income, and within-group inequality. If one interprets decreasing another participant's payoff below one's own as a tendency towards conflict behavior, our results suggest a higher risk of conflict among resource users in areas of greater scarcity.

Economic impact of climate variability in India: a Ricardian analysis

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The effects of climate change on Indian agriculture under different alternative climate scenarios are empirically studied. This paper uses the Ricardian approach that links the net revenue per acre as a function of climate, farm and households characteristics. We estimate the net revenue function using cross sectional data and quantile regression. Empirical results show that farms with higher net revenues per acre look to be more affected by climatic variables. In a second step we implement two climate scenarios which differ according to the assumptions on changes on average temperature and total rainfall (low increase, higher increase). We found contrasted regional effects. Under both scenarios, districts in the North of India would have experienced a decrease in net revenues per acre while districts in the South would have experienced an opposed effect.

Governmental Transparency and Environmental Performance of Local Government: An Empirical Analysis of Chinese Cities

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Democratic accountability is proved to be well theorized. But, it has long been known that China's political system is highly centralized. So, what can a public do with information absent a voting mechanism? This study discuss the influence of governmental transparency on environmental behavior from the perspective of city level in China. Using panel data of 110 environmental protection key cities from 2007 to 2011 to analyze whether the disclosure of government information has impact on introducing newly polluting enterprises by local governments. The results showed that: there is no significant relationship between governmental transparency and environmental performance. PITI variable only shows significance in the absence of GDP. But when we add GDP and other controls the PITI becomes not significant. The results proved that without a focus on specific mechanisms by which citizens can hold government accountable, transparency by government may be of limited value.

The effects of climate change to gender: Empirical Assessment from South India

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Several studies focus on the effects of climate change to gender relations as perceived through various biophysical and socio-economic aspects. Higher attention is given to the impacts of extreme weather events in agrarian communities of less developed regions. The findings are often interpreted in a qualitative manner by indicating policy measures that may improve gender inequalities. Often however, the interpretation of the qualitative results to more crisp and measurable outputs can be hardly attained while the validation of the findings is not ensured. To this end, the current study suggests the coupling of a qualitative assessment with quantified techniques for the evaluation of climate change effects to gender in South India. Fifteen villages exposed to drought events in Andhra Pradesh state were selected as pilot sites. The findings indicate that a large proportion of women own farmland while they significantly contribute to household income. However, the low representation in decision making matters deprive women from being treated in an equal manner. Also, the current unilateral initiatives taken by each gender for the alleviation of climate change impacts are bound to aggravate the existent inequalities.

Municipal Solid Waste and Development: The EKC Evidence for Mediterranean Countries.

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The application of the Environmental Kuznets Curve (EKC) to Municipal Solid Waste (MSW) in Mediterranean countries is particularly challenging given the sensitivity of these economies to a lot of environmental constraints due to socio-economic factors such as population growth, urbanization and economic development. This study is aimed at filling the lack of literature for these countries by testing the EKC for 19 Mediterranean countries over the period 1990-2010 and identifying the main determinants of MSW through a panel data model. Several original control variables are included, such as socio-economic factors, working women, education, technology and climate. Another original aspect of our research is the management of the missing data through the imputation method developed by Honaker and King (2010). Accordance with empirical results at cross-country level our results show that the EKC hypothesis does not hold for both developed and developing countries. The main policy implication for Mediterranean countries is that in the short or medium run, policy makers cannot use growth and development policies as a means of reducing MSW. This problem is even more acute since the model shows that some economic and socio-demographic factors will go on having a detrimental impact on pollution by increasing MSW. These are the rise in the working women ratio, the rise in young population ratio and the role of international trade (detrimental composition effect). Consequently, policy makers should urgently implement ambitious public policies dedicated to the reduction of MSW in these countries.

Inducing Sorting Investment and Implementation of an Alternative E-Waste Market under Imperfect Information

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In a context of high disposal costs in rich countries together with an imperfect monitoring system, the non reusable part of e-wastes is often illegally mixed with the reusable part and ends up in developing countries leading to an 'environmental injustice' and important negative externalities. To tackle this problem, we propose an alternative e-waste market for a joint trade in reusable and non-reusable e-wastes, other than the monitoring system and we analyze the optimal mechanism design for its implementation. In this paper, we use the theory of incentives applied to e-waste market. We want to show how to induce firms in North to undertake sorting investment that would help implementing the alternative e-waste market. Results show that, if the sorting cost is low, the optimal contract to induce sorting investment and to implement the alternative e-waste market for a joint trade in reusable and non-reusable e-wastes is the Baron-Myerson (BM) contract. Moreover, we identify conditions to avoid the standard market. Finally, we construct the optimal decisions of the firm in South over the set of sorting costs. One of the direct implications of the results is that if the cost is not too high to deter the sorting investment, the firm in South should give incentives to the firm in North to invest in sorting so that the alternative market can easily be implemented.

Dengue, Weather and Urbanization in Brazil

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Since two decades, the population affected by dengue disease is exponentially increasing and dengue is now affecting more than 100 million people in the world. It ranks behind malaria as the second most important vector-borne disease in the world and the first one in Latin America. Despite the important economic and social cost of the uncontrollable growth of the disease, little economic analysis has been devoted to it. In addition to weather, socio-economic factors such as urbanization and sanitary systems play an important role in the proliferation of dengue. In this paper, we measure the impact of weather and urbanization factors on dengue incidence in Brazilian states during 2001-2012, since Brazil is the most affected country in Latin America. We find a positive and statistically significant effect of temperature, urbanization, access to waste management system and to piped water. While the results on weather and urbanization confirm our ex ante hypothesis, the results on access to sanitary system is less intuitive.

The short-term effects of air pollution on health in Sfax (Tunisia): an ARDL cointegration procedure

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The purpose of this study is to explore the short-term causal link between air pollution and the frequency of cardiovascular and respiratory diseases in urban area of Sfax (Tunisia). We insist also on the influence of meteorological factors in the intensification of the adverse effects of the pollutants.

Using the Autoregressive Distributed Lag (ARDL) cointegration procedure introduced by Pesaran. M and Shin. Y (1999) and extended by Pesaran. M and al. (2001), the results shows that there is a significant link between pollutant emissions especially dioxide sulfur (SO₂) and the ozone (O₃) and hospital admissions for cardiovascular and respiratory diseases. We also concluded that the meteorological factors especially temperature and the wind velocity affecting the distribution of pollutants in the air and on the occurrence of these diseases.

Misfortunes never come singly: structural change, shocks and child malnutrition in rural Senegal

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In this study we consider the impact of drought and increasing prices shocks on child weight-for-age. The analysis is conducted with a multi-shock approach to account for concomitance of adverse events from the natural, biological, economic and health sphere. We use a unique dataset of children reported leaving in poor rural households in eight regions of Senegal in 2009 and 2011. The analysis relies on pooled-cross sections and accounts for structural changes occurring between survey periods. Results of drought (increasing prices) difference-in-difference econometric analyses show deterioration in child weight-for-age reaching 55% (20%) of the weight-for-age standard deviation in 2011. However, triple difference estimations accounting for drought and increasing prices concomitance show that weight-for-age for children experiencing both shocks is left unaffected. We argue that this last result is driven by the increase in rural household income and food security in the framework of the agricultural household model.

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