2011 Resources for the Future (RFF) Activities in Human Cooperation to Manage Natural Resources (COMMONS) program funded by the Swedish Research Council, Formas

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BACKGROUND

The May 26 agreement between the University of Gothenburg Department of Economics and Resources for the Future (RFF), RFF is to receive 600,000 kr (~87,000 USD) per year for 3-5 year to fund its participation in the COMMONS program. The Annex to that agreement, along with subsequent emails between Allen Blackman and Thomas Sterner, established that the first year’s allotment was to be split among four RFF researchers:

- Allen Blackman for work on various projects focused on environmental and natural resource issues in developing countries;
- Dallas Burtraw for research on bottom-up climate mitigation policies;
- Alan Krupnick for research on attitudes toward climate mitigation and adaptation in China, Sweden and the United States; and
- Juha Siikamäki for work on forest tenure reform in China.

Carolyn Fischer was originally slated to receive a share of RFF’s COMMONs funding in 2011, but in light of prior commitments, agreed to reassign her first year’s funding to Juha Siikamaki. In the second year of the project, Juha plans to drop out and Carolyn to begin participating.

This brief report summarizes: (i) activities undertaken by each of these researchers in the seven months since the May 26 contract was signed, and (ii) plans for COMMONS research going forward. Participating RFF researcher wrote each of the following sections of the report.

ALLEN BLACKMAN

First-year allocation

I used my first-year allocation to support research on several different environmental issues in developing countries. Specifically, COMMONS funds supported writing, revising or publishing six papers examining agricultural commodity eco-certification, ISO-14011 certification, and power plants in northern Mexico.

Agricultural Commodity Eco-certification

Voluntary eco-certification of high-value agricultural commodities such as coffee, cocoa, and bananas has been touted as a means over circumventing barriers to conventional mandatory environmental regulation in developing countries. Yet little is known about whether commodity eco-certification actually has such benefits. I used COMMONS funds to support work on several papers examining this topic. The first was an analysis of the environmental impacts of organic coffee certification in Costa Rica.

The paper, which is joint with EfD-Central America Research Fellow Maria Naranjo, was originally written in the winter of 2010, submitted to the American Journal of Agricultural Economics in November 2010, and (sadly) rejected in July 2011. COMMONS funding was used to support revisions of the paper in November 2011 and submission to Ecological Economics in December. It was the only non-RFF funding used for these tasks. The second paper is


The paper, which is joint with EfD-Central America research fellow Jorge Rivera, is a review of the literature on the producer-level benefits of sustainability certification in the coffee, bananas, forest products, fish products, and tourism sectors. It was carved out of a pre-existing report (for the Science and Technical Advisory Panel of the Global Environment Facility) and submitted to Conservation Biology in August 2010. COMMONS funding was used to fund the (drastic) revisions requested by reviewers in the summer and fall of 2011. It was the only non-RFF funding for this revision. The last paper is


This paper was written in September and October 2011. COMMONS funding leveraged support provided by Mistra through the Entwined program. We hope to submit the paper for publication in late winter or early spring 2012.

ISO 14011 Certification in Mexico

ISO 14001 is the largest voluntary environmental program in the world, that is, the largest program that relies purely on incentives, rather than mandates, to improve environmental performance. Like commodity eco-certification, it has been touted as a means of sidestepping chronic barriers to the effectiveness of conventional mandatory environmental regulation in developing countries. Our papers examine the drivers of ISO14001 certification in Mexico and test whether it has environmental benefits. COMMONS was the sole source of non-RFF support for this work. It was used to write or revise two papers. The first is


This paper was submitted to the Journal of Comparative Economics in May 2011. COMMONS funding supported two revisions in June and August 2011. The paper was accepted for publication in August. The second paper is

This paper was submitted to the *Journal of Regulatory Economics* in August 2011. COMMONS funding was used to support revisions of a pre-existing draft prior to submission. A (minor) revision was invited in December 2011.

**Power exporting plants in northern Mexico**

In the past two decades, rapid population and economic growth on the U.S.–Mexico border has spurred a dramatic increase in electricity demand. In response, American energy multinationals have built power plants just south of the border that export most of their electricity to the U.S. This development has stirred considerable controversy because these plants effectively skirt U.S. environmental air pollution regulations in a severely degraded international airshed. This project uses a suite of air dispersion, health impacts, and valuation models to assess the human health damages in the U.S. and Mexico caused by air emissions from two such power-exporting plants. The paper was derived from a report to the LASPAU Foundation and submitted to *Energy Policy* in March 2011. It was revised and resubmitted from July–November 2011 and accepted in December. COMMONS funding was the only non-RFF funding used for the submission and revisions.


**Second-year allocation**

I plan to use the second-year allocation of COMMONS funds for two purposes. The first is to support an analysis of the costs of Mexico’s *Hoy No Circula* (HNC) program that prohibits cars from being driven one day a week depending on the last digit of their license plates. Such programs have proliferated rapidly in developing countries in recent years. Past analyses suggest that the HNC program has limited environmental benefits. Our study, which is joint with EfD-Central America Research Fellow Fredrik Carlson and Marisol Rivera at the National Ecology Institute (INE) within the Mexican Environment Ministry, aims to measure the program’s costs using contingent valuation methods. We have already developed a survey instrument. COMMONS funding will be used to support my participation in the piloting and administering the survey.

The second purpose for which I will use COMMONS funds is to continue to do what I did in 2011: write, revise, and resubmit various papers on environment and development topics.

**DALLAS BURTRAW**

This section provides an expanded description of the COMMONS research project on bottom-up climate policy and reports on the progress. This project is motivated by the observation that cooperative solutions (in a game theory context) among sovereign nations to address climate change is slow to emerge. Optimistically, climate change represents an enormous coordination problem that takes substantial time. Less optimistically, sovereign nations might be assumed to act in a strategic, noncooperative context.
At the subnational level one finds significantly greater rhetoric in favor of climate policy and substantially greater numbers of actions being taken, even as those actions are usually less potent than could be achieved at the national level. There are economic reasons that some jurisdictions might initiate climate friendly policies, due to distinct preferences among populations or to relatively advantageous positions in a carbon constrained economy. Nonetheless, there appears to be activity at the subnational level.

At the national level, economic interests may oppose activities at lower levels of government. One reason is the emergence of patchwork regulations may raise the cost of business. Second, regulations at the subnational level can be used as barriers to trade to favor native business. In addition, a substantial literature has argued that subnational policies are inefficient and should be tolerated only until national policy emerges that can rationalize subnational activity by subsuming it and preempting deviations from national standards.

This project aims to understand the political economy that enables and sustains climate policy at the subnational level. Two questions are central to the research. First, can policy design that facilitates rather than preempts subnational efforts be more efficient? Second, in the US context how might the quantity of emissions reductions achieved through subnational efforts compare to national policy?

**Efficiency of subnational policy design**

The framework to address this question will be the characterization of Lindahl prices, which describe a system of prices for public goods that vary across individuals (or in this case, jurisdictions) based on willingness to pay. Lindahl prices are expected to elicit first best levels of the provision of a public good. The difficulty with Lindahl prices is the strategic incentive for parties to misrepresent their willingness to pay to effectively free ride.

Overcoming the free-riding problem is beyond the scope of this project. However, it is meaningful to investigate whether the aggregation of payments (policy efforts in this context) at the subnational level could lead to a more efficient outcome than the nationally determined level of effort over the same population of preferences. In general this can be expected to depend on the distribution and evolution of those preferences over time. We conjecture a life cycle model wherein national policy might be inferior at some stages in the development of climate policy. Moreover, we investigate whether preemption is advantageous, relative to other designs such as decentralized opportunities to meet or exceed the national standard.

Another important element of political economy is the determination of political preferences, based upon underlying climate policy preferences, under different types of federalist systems. Although there may be exceptions, one might stipulate that the climate related benefits of local action are small and not observable at the local level. However, the costs of climate policy are observable at the local level. When policy is usurped to the national level, local governments are stripped of any ability to affect the design of policy in ways that might accommodate their interests. One is reminded of the economic problem of the household, where constraints are imposed on children. Practical experience teaches that those children are less likely to resist the constraints when they are involved in setting the constraints or in determining how they will be
met. Similarly, if local governments are involved in the design of climate policy it empowers advocates for such policy at the local level. If local governments are not involved, then climate policy advocates are effectively silenced at the local level even while the costs of such policy are readily apparent.

Local governments play a central role in investment in infrastructure that will help determine our ability to address climate policy challenges in the future. One finds a high degree of stakeholder involvement in the determination of these local issues. When climate policy is assumed at a higher level of government, there is no local political benefit to advocating for such policy, while there remain many reasons to oppose policy that imposes those costs.

Measure of emissions reductions

The role for subnational governments is enshrined in the U.S. Clean Air Act, which recently has emerged as the major vehicle for climate policy, in the absence of national legislative action. Under the relevant portions of the act, local governments are to be involved in a planning process subject to U.S. EPA approval to demonstrate how emission reductions standards determined by the EPA will be achieved. The first steps of this project have been to assess the mechanism through which state governments can exercise discretion, and in particular, how they can utilize incentive-based approaches such as tradable performance standards or cap and trade to achieve these standards.

An important aspect of the national legislation (HR 2454) that passed the U.S. House of Representatives but did not pass the Senate, the so-called “Waxman-Markey” legislation, was the explicit preemption of many areas of authority of the EPA under the Clean Air Act. Furthermore, by implementing an emissions cap, the Act would have effectively determined the minimum as well as the maximum allowable level of emissions. This occurs because when subnational governments take measures to promote climate friendly policies such as sustainable land use, under an emissions cap it has the effect of lowering the allowance price while not changing the total number of allowances that are available at the national level.

We have compiled an initial comparison of the emissions reductions that were expected to be achieved under HR 2454 as estimated by the Energy Information Administration and compared that to our own estimates of emissions reductions that will be achieved under the Clean Air Act regime. These results are presented in the following table. The first row describes emissions reductions from stationary sources under the Clean Air Act, based on EPA technical documents. This is an upper bound estimate based on technology options, but they are not an upper bound if one allows for fuel switching from coal to biomass or natural gas. These opportunities are additional under the Clean Air Act but would have been precluded under HR 2454. The second row illustrates the role for emissions reductions under mobile source standards under the Act. We assume these would have been achieved under HR 2454, although that is a generous assumption. Third, we examine the role of shale gas. EIA estimates this will lead to a reduction of 241 million metric tons CO2 in 2020 in the electricity sector. Under HR 2454, these reductions would have lowered allowance prices and allowed greater emissions reductions in other sectors. We estimate it would have led to a net reduction of 163 mmt CO2. We assume no further state policies promoting renewables, although that would seem to contradict recent evidence. Finally, subnational efforts such as those in California (and in the northeast states)
yield 49 mmtCO₂ further reductions that would not contribute as additional under an emissions cap.

We add these changes to those estimated by EIA in 2009 to indicate that 12.9% reduction from 2005 levels would be achieved by 2020 under HR 2454. In contrast, 12.7% would be achieved under the Clean Air Act regime. These estimates are preliminary and they will be developed more carefully in the next stage of the project, but they illustrate the possible way that subnational efforts and changes in technology and fuel markets can be considered additional whereas they are largely not additional under national cap and trade.

<table>
<thead>
<tr>
<th>mmtCO₂</th>
<th>Additional Emission Reductions under W-M</th>
<th>Additional Emissions Reductions under CAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Air Act for stationary sources</td>
<td></td>
<td>442 (upper estimate)</td>
</tr>
<tr>
<td>CAFE</td>
<td></td>
<td>2016 standards included, extended standards might be additional</td>
</tr>
<tr>
<td>Shale Gas</td>
<td>163</td>
<td>241</td>
</tr>
<tr>
<td>Renewable Policies</td>
<td></td>
<td>Assume no further state policies</td>
</tr>
<tr>
<td>California</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>TOTAL Emissions Reductions</td>
<td>743 (12.9% from 2005 levels)</td>
<td>732 (12.7% from 2005 levels)</td>
</tr>
</tbody>
</table>

In sum, this project is proceeding in two ways. One is a conceptual exercise to understand the political economy of subnational action around climate policy, and especially how those actions interact with national level actions within a federalist system. We are interested in the efficiency of decentralized approaches as well as the institutions (such as the Clean Air Act) that might facilitate and coordinate those efforts. Second, we are interested in empirical estimates of the climate policy measures that could be expected, and the emissions reductions that might be achieved.

ALAN KRUPNICK

This project, which is joint with EfD Research Fellows Thomas Sterner, Ping Qin, and others, used already-conducted surveys aimed at comparing attitudes toward climate mitigation and adaptation activities in China, Sweden, and the US. It studied the willingness to pay for carbon reductions and of fairness in effort-sharing rules from the citizens’ points of view. Identical surveys were administered in each of these countries concerning people’s attitudes towards
greenhouse gas reductions and how they depend on the global distribution of these costs. COMMONS funding was used to help support survey work.

JUHA SIIKAMÄKI

My COMMONS funding supported a total of 134 hours. I have allocated the funding to two projects: 1) Collaboration with EfD-China coordinator Jintao Xu on the effects of forest tenure reform in China on forest management decisions (Chinese FTR project), and 2) Evaluating the global economic potential for reducing CO₂ emissions from coastal ecosystems (Blue Carbon project). I have used a total of 84 of the 134 hours of COMMONS funding since July 2012.

Originally, my intent was to heavily focus on the Chinese FTR project, in particular, analyzing the second round of survey data from China, which was expected to become available late in the summer. Although the surveys were concluded by then, the resulting data require massive cleaning, checking, and manipulations before meaningful analyses can be conducted. As a result of delays in the availability of estimation datasets, some of my work on the Chinese FTR has been delayed. Regardless, Jintao and I have worked on developing the research approach in the fall 2012. I have also been involved in planning the next steps of the project, including discussion what manipulations are required to the original survey data used to construct estimation datasets. We have had regular meetings at RFF with Jintao and his assistant and we have also had a meeting at the World Bank.

On the Blue Carbon project, my focus using COMMONS funds has been developing a journal manuscript, which draws from and extends the findings described in a broader RFF report (see below). The work developed in the report was funded by other sources and completed before COMMONS funds were used. The manuscript focuses on evaluating the economic potential for preserving mangroves solely from the perspective of mitigating CO₂ emissions occurring as a result of coastal development. We have prepared the manuscript and are currently finalizing its submission to the Proceedings of the National Academy of Sciences (PNAS). The submission is almost complete and we expect to finalize it by the end of 2012, possibly in the next few days. I have also given two presentations of the Blue Carbon project; one at RFF in September and another at the EfD annual meeting in Arusha, Kenya, in October.

Below, I list the relevant publications and presentations to which my COMMONS funding contributed.

Publications


Presentations
‘Blue Carbon: Global Options for Reducing Emissions from the Development of Coastal Ecosystems,’

a. 5th Annual Meeting of Environment for Development Initiative, Arusha, Tanzania, October 30, 2011.
b. Resources for the Future, September 27, 2011

I plan to use the remaining COMMONS funds from 2011 to work on China FTR project.