



**Realizing Local Development in the
Carbon Commodity Chain
Political Economy, Value and
Connecting Carbon Commodities
at Multiple Scales**

Adam Bumpus



United Nations
Research Institute
for Social Development

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Social Dimensions of Green Economy and Sustainable Development

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Acronyms

CDCF	Community Development Carbon Fund
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CSR	Corporate social responsibility
EU ETS	European Union Emissions Trading Scheme
GHG	Greenhouse gases
GS	Gold Standard
ICS	Improved cookstoves
MRV	Monitoring, reporting and verification
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-governmental organization
PoA	Programme of activities
REDD+	Reducing Emissions from Deforestation and Forest Degradation
tCO₂e	Tonne of carbon dioxide equivalent
VER	Voluntary emissions reduction

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Summary

This paper provides an analysis of how local community development is connected to the global carbon economy through the creation of carbon commodities (offset credits) and the role of premium credit certification in assisting in local development. The paper shows that information on local conditions should be focused on political-economic processes and the interactions between actors to nuance the social benefits of carbon credit generation in developing country contexts.

International carbon finance markets are seen as tools to reduce global emissions at lowest cost and contribute to sustainable development in developing countries. Carbon finance can potentially create lasting development benefits, including the transition to—and scaling up of—low carbon sustainable economies that are pro-poor. However, the social benefits of carbon finance have so far been unevenly distributed. Carbon markets that are focused solely on carbon reductions tend to obscure local social development contexts. In order to redress these imbalances, pro-development carbon funds and standards to certify projects with local benefits have been created to help place a price on local social dimensions of projects. This paper, however, shows that although such premium carbon¹ certification may increase global carbon credit prices, it does not necessarily improve local conditions. Therefore, premium carbon should be seen within broader contexts:

- projects are “wired in” and connected through multiscalar political-economic structures that create both opportunities and constraints for local development within and outside of pro-development labels and funds;
- global carbon finance influences do not flow unidirectionally: local agency interacts with global structures of carbon finance, reworking it in local contexts and shifting the value placed on credits at global levels; and
- the communication and “unveiling” of local production of the carbon commodity does not necessarily change local outcomes, but provides some movement to include social dimensions in a more structured way.

Through illustrative case studies, this paper shows that the communication of local benefits to buyers of carbon credits does not outweigh the political economy of project implementation and the requirements for creating and calculating carbon reductions as commodities. Instead, local outcomes are determined by specific connections, and knowledge and power asymmetries that link buyers in carbon commodity chains with local people. For example, a small-scale hydro plant in Honduras provided local jobs, reforestation and some communities with electrification. The project was funded by pro-community development carbon funds, and retroactively registered to the Gold Standard to provide a price premium on the credits. Local benefits, however, were uneven and mediated by local power relationships between project developer and communities, and the agency of certain communities to renegotiate based upon their natural and social capitals independently of the project’s status as premium carbon. On the other hand, pro-development carbon labels enabled integrated carbon-development technologies, such as cookstove projects, to be scaled up and communicated outside of more complex compliance markets by fostering local institutions and creating cross-scale connections and partnerships.

The conclusions of the study have specific policy implications:

1. *Local participation in globally financed mechanisms:* Ensuring interaction with local people in a systemic and integral way is important for premium or “ethical” carbon to work. Engagement with local people at all project stages—design, implementation and continued use—is important to ensure effective use and

¹ “Premium” carbon relates to the inclusion of certain carbon offset projects into standards, such as the Gold Standard (www.cdmgoldstandard.org), which aim to certify and communicate the social benefits of projects to buyers.

communication of benefits. This is especially the case in carbon reduction projects that are decentralized and rely on local capacity to scale up projects and monitor carbon reductions over time.

2. *A focus on political-economic processes:* Reporting on systemic local inclusion should focus on political-economic processes and be communicated through monitoring, reporting and verification (MRV). The power tools of carbon finance – MRV – could be adapted to systematically incorporate reporting on processes for local social development in addition to carbon at the verification stage. The prevalence of MRV in current climate debates could be also used as a hinge for better incorporation of social dynamics into future international climate finance mechanisms (such as the United Nations collaborative initiative on Reducing Emissions from Deforestation and Forest Degradation/REDD+ and the development of Nationally Appropriate Mitigation Actions/NAMAs). This builds on existing efforts from organizations like the Gold Standard.
3. *Meeting in the middle: meso-level analysis and transparent information:* Linking political economy information and analysis with an actor-oriented approach at micro, meso and macro levels (that is, including intermediary actors in addition to global analysis and detailed local case studies) will provide tools for both analysis and participation throughout the carbon commodity chains. Structuring possibilities for local participation and information generation through carbon standards and regulation would facilitate this broader research-based accountability mechanism.
4. *The limits and possibilities of pro-development carbon labels:* Aiming to reveal local social relations to the fullest extent possible may a priori render the use of markets inappropriate because of increased transaction costs and inherent uneven development characterized by market expansion. Moreover it is not possible for labels to convey completely local conditions of production. As a result, labels could potentially undermine local processes. Despite this, investors are focusing on high quality offsets and multiple layering of benefits. Therefore more information, accurately collated and presented, may help in this broader sea change to high quality offsets, especially in light of the movement toward process information in addition to tick-box outputs. New media, communications and crowd-sourced data (associated with social benefits and carbon MRV) are interesting avenues for continued research and policy innovation to support this movement pushed by pro-development labels and standards.

A more inclusive social development component in carbon finance would therefore require three “I”s: **information** on benefit and power asymmetries; **inclusion** of local agency by structuring participation at systemic levels; and **innovation in communication** of participation in the carbon commodity chain. These components would help provide an understanding of the interconnections that mediate social-carbon relations, and foster social inclusion in connecting greening economies.

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Introduction

The global green economy will be characterized by connections between communities, companies, markets and governments across space and scale. International carbon and climate finance are already creating emissions reductions that link buyers in developed countries with carbon-reducing activities in developing countries. These emissions reductions are used as legal compliance tools (for example, under Kyoto), voluntary actions (such as for corporate social responsibility initiatives) or creating broad-based bilateral or multilateral emissions reductions agreements (such as climate finance²). This paper examines the effect of international carbon finance mechanisms on local development through an examination of the political economy of projects, the creation of carbon commodity and the use of “premium” carbon labels, and broader carbon governance processes.

Carbon finance creates new commodity chains that transcend traditional economic barriers and link developed country emitters with developing country communities and projects (Bumpus and Liverman 2008). The paper focuses on global-local institutional linkages along carbon commodity chains and shows how socio-ecological relations affect the commodification of carbon and its communication in global markets. Following examples of Fair Trade commodities, the paper asks questions about the politics, interests and material nature in creating offsets that link global spheres of influence to local places (Bacon 2010; Newell and Bumpus, forthcoming). The paper examines how locales are wired in to broader political economies by exploring North-South links, how “value” is interpreted and created in the commodification of carbon, and its effect on access to development benefits in local contexts.³ The paper examines local use values (local benefits associated with the utility of a project creating carbon credits) and their relationship to global exchange values (the price of the carbon commodities from a project). Key to understanding how the social dimensions of carbon offsets may be improved is, therefore, examining the institutional, material and social dimensions involved in creating a tonne of carbon dioxide equivalent (tCO₂e) as a commodity, and the relative importance of how local benefits are incorporated into global carbon prices. The paper asks: given that carbon finance creates additional⁴ opportunities for project development, what then mediates local social benefits?

Premium carbon – carbon credits with high local development benefits that have been certified by organizations such as the Gold Standard (GS)⁵ or Climate Community and Biodiversity Standards⁶ – command a higher price in the carbon markets when buyers value development stories associated with carbon reductions (Nussbaumer 2009; Parnphumeesup and Kerr 2011). They include a wide variety of projects, including improved wood cookstoves, efficient light bulb installations and small-scale hydroelectricity and agroforestry. Common to these projects is the certification of local benefits and their communication in global markets, not dissimilar to Fair Trade products such as coffee, which create an “ethical formation” of both product and associated social benefits (Mutersbaugh and Lyon 2010:28). Focusing on information and transparency in commodities, fair trade analyses critically examines the commodity chains or products, the interests of different actors and dynamics of inclusion and exclusion, and “the role

² Carbon finance refers to North-South flows of capital that pay for emissions reductions, which in turn create carbon credits used either for compliance under Kyoto (through the Clean Development Mechanism/CDM) or through voluntary carbon offset activities (for marketing or other non-compliance activities). Climate finance, on the other hand, refers to broader structures of bilateral and multilateral funding provided to assist with broad scale emissions reductions (such as through Reducing Emissions from Deforestation and Forest Degradation/REDD+) and/or capacity building through adaptation initiatives agreed as “fast start climate finance” pledged at Copenhagen in 2009.

³ Bumpus 2011; Boyd et al. 2009; Liverman 2004.

⁴ Additionality in carbon offsets is the concept that the project would not have been undertaken were it not for carbon finance, and therefore creates additional carbon reductions to a business as usual scenario. This is a controversial subject and the nuances of additionality are covered well elsewhere (Asuka and Takeuchi 2004; Schneider 2009). I assume additionality here and consider the social dynamics given this condition.

⁵ www.cdmgoldstandard.org.

⁶ www.climate-standards.org.

of standards in facilitating or hindering participation” (Bolwig et al. 2010:174). I ask here whether ethical carbon commodities might provide new possibilities for social change. Do they provide new avenues for struggle for economic justice, or are they palliative measures that may even undercut other progressive alternatives to equitable distribution? Are there certain structural and technological elements that more effectively influence local development possibilities?

The paper asks two main questions.

1. How are projects wired into the wider carbon economy, and with what local development effects (for example, through carbon standards, particular institutional relationships and technologies)?
2. To what extent are local use values associated with a commodity affected or improved by global exchange values that value local development dimensions of credits (for example, through standards, information or monitoring)?

Centrally, the paper contends that although labels may communicate the local benefits of projects, local development outcomes are more strongly affected by the political economy of projects, local agency in mediating project development outcomes and the inherent benefits of certain technologies. The paper is based on fieldwork carried out for doctoral research between 2006 and 2009, including over 80 semi-structured in-depth interviews with policy makers, communities, project developers and verifiers, and participant observation for eight months in the field. It builds on an emerging body of work examining sustainable development and carbon finance.⁷ The next section provides an outline of the approach and context of the issue. The paper then examines concepts of value in the creation of carbon commodities and presents illustrative carbon offset case studies—micro hydro Clean Development Mechanism (CDM) projects, and voluntary carbon market improved cookstoves projects.⁸ A discussion follows on the context of explaining development outcomes and finally the paper presents policy implications and ideas for future research agendas on the issue.

North-South Links in Carbon Finance

Value in carbon commodities

As global environmental governance of carbon markets and climate finance mechanisms evolve, the inclusion (or exclusion) of spaces, technologies, ecologies and people in the South is altered. Therefore the traits that global carbon markets value—accurately monitored and highly verified carbon reductions, broad-based sector-specific carbon reductions, or projects with high local co-benefits—have specific influences on Southern locations. Likewise, critical accounts of offsets, and increased transparency and mobilization of Southern actors re-engage global mechanisms and aim to rework international policy directions (Peet et al. 2011). Such a critical two-way approach is important given the increasing use of markets to govern climate change, multiple scale contexts, and effectiveness and equity debates focused on the promise of \$100 billion⁹ per year by 2020 in North-South climate finance to assist in mitigation and adaptation (Ballesteros et al. 2010).

The broad political ecology approach used here seeks to explain how local-level cultural and ecological communities form part of (and are influenced by) a much wider set of political and

⁷ See Bumpus, 2009, 2011; Bumpus and Cole 2010; Bumpus and Liverman 2008; Newell and Bumpus, forthcoming; Simon et al. 2011.

⁸ A distinction exists between carbon offset markets, such as the CDM—which is used for compliance under the Kyoto Protocol—and the European Union Emissions Trading Scheme (EU ETS), and those bought voluntarily for marketing, corporate social responsibility or public relations reasons (see Bumpus and Liverman 2008 for discussion).

⁹ All \$ figures refer to US dollars.

economic structures (Peet and Watts 2004) that often have national and global linkages.¹⁰ This approach complements commodity analyses that “look” up and down scales, and across networks, of North-South relationships examining inequality and value asymmetries between and among actors. Indeed, the social inequality in carbon offsets can be related to the value placed on different forms of carbon finance by different governance systems and their relationship to host communities and economies. Value is multifaceted and not related simply to financial metrics or price (Martinez-Alier et al. 1998). Different stakeholders located at the local, regional and global levels value ecosystem goods—and the distributional outcomes of development projects associated with carbon finance—differently.

Understanding the role of different values through the creation of commodities is important in interrogating the broader shifts in climate finance policy and getting to grips with the relations of exchange between communities, project developers, governments and carbon buyers across scales and power asymmetries. Carbon commodities mean that new projects are created in real locations and have specific effects on local livelihoods, equity and development pathways. The use of markets for carbon and the single language of monetary valuation through exchange of carbon, however, renders local values on ecosystems invisible because the dominant requirement for information, and metric of financial value, is the accuracy of the tCO_{2e} reduced which determines its eligibility for the market (Kosoy and Corbera 2010).

At the risk of over simplifying, a commodity first has a use-value: a thing that by its properties satisfies human wants or needs and provides a direct value to those who realize it (Kosoy and Corbera 2010). For example, the use values in a carbon cookstove project could include local effects such as reduced indoor air pollution or increased economic savings associated with an improved stove project. Next, carbon reductions associated with the project are calculated through specific methodologies, accounting processes and monitoring of project activities, and turned into information that represents carbon reductions. This information then becomes a certified carbon credit that has an exchange value in the market (see Bumpus 2011). This process of commodification creates carbon reductions that are fungible with carbon emissions and allows an offset to take place. It also, however, veils the nuances of credit production, dislocating the local social, environmental and power relations that were needed to create it. This is useful for large-scale emissions reductions, but omits the social dimensions of how those credits were created, and opens up debates on ethical conditions of production (similar to those seen in the growing and manufacturing of other products; see Hudson and Hudson 2003).

Using information for development in carbon finance

Local development associated with carbon finance necessarily comes second to the creation of the carbon commodity. It is not formally defined or financially accounted for in the market (Olsen 2007; Sutter and Parreño 2007). A market for premium high development carbon offsets, however, is growing, as calls from both developing country actors and market-based actors come together to address the lack of transparency on development in carbon finance. This movement was initially fostered through specialist funds, such as the World Bank’s Community Development Carbon Fund (CDCF) and the emergence of premium carbon standards. More recently, broad policy directions have specified the use of carbon finance in development contexts, for example, in the European Union Emissions Trading Scheme (EU ETS), which stipulates all new CDM offset projects registered from 2012 must be sourced from least developed countries.

Investors are also increasingly looking for multiple attributes bundled into the carbon asset (“carbon *plus*”) to lower project risk through better management practices, include corporate social responsibility (CSR) initiatives and hedge risk against future compliance changes. Moreover, premium carbon offsets aim to ensure that the local conditions of carbon offset projects (an emphasis local use value) are represented by increased value in the market (its

¹⁰ Batterbury 2001; Bebbington and Batterbury 2001; Bebbington 2003: 301; Neumann 2009.

exchange value, or price increased by this information). For example, the electronics company, Panasonic, chose GS projects for both the quality of carbon reductions and their contribution to local community benefits as part of the company's global sustainable development activities (Gold Standard 2011a). As the Gold Standard website (2011b) notes, "The Gold Standard approach means lower project risk through more inclusive and thorough design, higher investor confidence, greater access to carbon finance, better projects for communities and a superior price due to higher demand for a premium product".

The role of standards lies in informing consumers about the social and environmental conditions in which the offset projects take place, so they can "render ethical qualities visible to the consumer" (Mutersbaugh and Lyon 2010:27), influence demand and make choices about buying pro-poor carbon projects. Certain buyers are willing to pay a premium price for these credits because they spend more money on local benefits and monitoring to convey these local conditions. The unveiling of these conditions of production can, therefore, be seen as an attempt to recommodify the social relations (development aspects) of its creation by making it visible in the market and charging a premium (Bryant and Goodman 2004). Lovell et al. (2009) show that non-governmental organizations (NGOs), companies and government buyers are shaping the kinds of production that occur in offsets as a result of how consumption practices produce narratives that support new forms of carbon offset production. Analogous examples in Fair Trade coffee point to both increases profits for local farmers while commanding a price premium in consumer markets by unveiling the social aspects of commodity production. The use of fair trade labels may shorten the distance between consumers and producers and allow increased local upgrading such as economic or other benefits, or continue to legitimize the role of industrially-led interactions between Southern producers and Northern consumers, obviating alternative modes of economic production (Muradian and Pelupessy 2005; Raynolds 2009). Indeed, it seems labelling schemes should be seen as part of a package that aims to redistribute power along commodity chains. In addition to creating alternative governance mechanisms that should aim to ensure greater equity, local actors act to move between broader political-economic constraints associated with carbon commodity production and use agency to determine local outcomes (Bebbington 2001; Taylor 2005).

Connecting Carbon Projects

The paper now provides two brief case studies: a micro hydro plant and improved cookstoves carbon projects. It examines their global-local links; how they are integrated into premium carbon standards, and the requirements of technology. It is important to note here that these individual project case studies, and the general project types, do not form comparative assessments. Instead they are used to illustrate different mechanisms for understanding local to global interactions for social inclusion through carbon finance.

Hydro in Honduras: Pro-development funds, labels and local agency

Creating a pro-development CDM micro hydro project: Global-local links

This small-scale, 12.77 megawatt run-of-river hydroelectricity¹¹ project in Honduras was financed by the World Bank's CDCF and was successfully registered as a small-scale CDM project in 2005 (World Bank 2006). Explicit to the creation of the project was the connection to the CDCF, which was showcasing the project as an example of how carbon commodities can create local community development benefits. The specific role of the CDCF was important, particularly in the context of prior rejection of the project by the World Bank's Prototype Carbon Fund, and non-economically viable credit purchase prices by national government carbon funds at that time. Its connection to the carbon economy through the CDCF aimed to

¹¹ Although the project did use small dams, it had only daily capacity for water storage and relied on more or less continuous flow of the river to generate electricity.

ensure that the project developer would assist communities in reforesting denuded hillsides in the watershed; provide electrification for communities near the hydro project site, and provide employment opportunities at specified levels for local people in the construction and maintenance of the project (interview with project developer, 2006). In this way, the specific aims of the fund as selling “carbon plus development” projects at a global level were incorporated in to the local requirements for operation.

Development assistance was, however, contingent on the communities’ willingness to work with the project developers in order to facilitate the effective running of the dam, and, therefore, its generation of the carbon commodity (tCO₂e) for the World Bank. The project developer, therefore, could choose which communities received assistance for electrification, and to assist them in an appropriate manner. Primarily, assistance was focused on the effective running of the dam in order to create the carbon commodity, not based on addressing specific local development needs. This is a common outcome in CDM projects where “carbon comes first”, but is not surprising, given that without any CO₂ reductions the project would not have been financed (that is, its case for additionality). As a director of the project developer noted, “it was some development, or no development...if we would have been forced to deal with some groups and not had the flexibility to work around them, it could have stopped the project before it was completed and we would have failed miserably” (interview with project developer, 2006).

As a result, local development initiatives were focused on communities that could assist in the effective functioning of the dam, such as those that could provide workers, had important watersheds and were on the main road and electricity line. A local dispute, however, meant that electrification benefits (the biggest additional development benefit beyond providing trees for reforestation and employment) by-passed one community next to the dam facilities. In addition, the provision of electrification to other communities did not go so far as to ensure all community members were able to access the main line, and as a result some of the poorest members were still without electricity in 2009.

Technology needs and local agency in shaping outcomes

As shown in table 1, communities were important in providing ecosystem services such as watershed protection, and operational services such as construction labour, for the effective running of the hydro plant. However, development benefits were focused (at least initially) on the functioning of the technology in the dam, or the community relations needed to mitigate operational and political risk in the area. For example, electrification of the closest community was not an additional development benefit brought about by the project’s relation to “development plus carbon” finance, but was deemed good local business relations for the company (interview with project developer 2006). This meant that the project followed standard patterns of capitalist development that were mediated by communities’ relationship with the company, their provision of workers to the project, and CSR. However, for one community that owned land containing important watersheds for the project, local social organization and mobilization helped them gain more benefits from the project. Using natural capital and strong community organization, they renegotiated increased development benefits, such as community electrification. On the other hand, communities that controlled some valuable natural capital but were not organized to put forward united initiatives to negotiate more development, found that they received significantly less assistance (see table 1). We can see here that carbon finance and local benefits are not passively received, but as in other development contexts, locally reworked according to various capitals employed by local people.

Table 1: Development benefits in local communities in 2009

Community	Development benefit	Institutional and technical involvement in providing development
Community 1—near the hydro site	Electrification (85% electrified)	World Bank mandated electrification of specified number of homes. Project developer involved to help create good public relations.
	Reforestation	Watershed not so important to project developer, but worked with water group of community 1 for some reforestation; assisted in providing new water line to community.
	Employment	Project developer recruited heavily from community 1. Training for workers given on the job.
Community 2—on important watershed hillsides	Electrification (56%-85% electrified)	World Bank mandated some clerical help in applying for electrification. Project developer went beyond that and electrified main line into community.
	Reforestation	Community lands very important to watershed used by project developer, who provided all saplings and their transportation to community lands.
	Employment	Jobs offered, but less contact than with community 1.
Community 3—near the hydro site	Electrification (0% electrified)	Land access issues and conflict resulted in the project developer not electrifying the community. World Bank stipulations are flexible and based on communities that are not in conflict with project developer.
	Reforestation	Some reforestation, but community lands less important than in community 2.
	Employment	Jobs offered, and some workers from community 3 at plant.

As a result of this negotiation, and the disposition of company directors as “citizens in the community”, the company went beyond requirements of carbon finance and quadrupled the number of houses electrified in order to achieve its CSR objectives and help create its social license to operate (Moon 2007). This surpassed requirements dictated by pro-development carbon funds, although these developments were subsequently incorporated into discussions and communications on the project. In this way, even though the project was promoted through a fund focused on making carbon finance work for the poor, local agency and requirements were more effective in improving local development possibilities.

Labelling the project

In addition to extra finance from the World Bank to mediate local differences and improve monitoring, the project was retroactively developed as a GS project in 2008. This required a second round of stakeholder meetings and new documentation on the project, including the creation of the GS sustainability matrix, which asserts sustainable development benefits. The project passed with a +10 score (Sterk et al. 2009), attained through its existing operations, which were deemed by international and local Honduran NGOs and the verifiers of the project to be sufficient to qualify for the certification. The stakeholder meetings detailed the role of the GS in the project and especially noted the benefits from improvement of the electricity supply, electrification of nearby communities, job creation and the accompanying reforestation programme. They also noted, as shown in table 1, some uneven development implications, such as the need for electrification of the very poor households still without electricity.

The application of the GS label meant, however, that the project could improve its command for a premium price in the carbon market: local use values were linked to the exchange value and reflected in credit price. For example, the retailers of the project estimate that the additional revenue received from using the Gold Standard is about €3 per tCO_{2e}.¹² This translates into additional carbon credit (Certified Emissions Reductions/CERs) revenue of €111,095/year, far exceeding the €73,000 for additional monitoring (which is to be undertaken at each verification period on a recurrent basis through out the crediting period) and verification associated with the project's sustainable development components (Sterk et al. 2009).

In sum

Beyond initial financing, this project fits more within debates on corporate activity in developing countries and local CSR initiatives, than with pro-development carbon finance (see Newell and Frynas 2007). As the World Bank made clear, local development initiatives were to be based on material project success, similar to CSR negotiations that rely on material interests of firms operating in the South (Newell 2008). The project did have local benefits resulting from its work with local communities (Bumpus 2009). However, the inclusion of the Gold Standard reaffirms that the label is more likely to be attached to projects that already have sustainable development attributes, rather than help to improve upon these attributes (Sterk et al. 2009). It did not, in this case, specifically mediate local uneven development, although it has helped ensure continuation of social programmes running at the plant.

Carbon-financed cookstoves: Technology, monitoring and labelling

This section explores the creation of carbon commodities in the case of improved cookstoves in Honduras. It illustrates the global-local links in such projects, and how the technology used can influence both local values and global commodity value. Given the limited coverage in the literature, this section draws on fieldwork from three case studies and Simon et al. (2011) to show how carbon finance works to scale up local stove economies and provide local capacity building for stove monitoring and verification.

Creating cookstove carbon projects: Global-local links and labelling

Improved cookstoves (ICS) aim to reduce indoor air pollution for families that currently use traditional biomass stoves based on open fires (Mann 2007). Improved stoves aim to reducing indoor air pollution by using chimneys, improving efficiency in burning, reducing local deforestation, improving health, creating greater gender equity and empowerment, education and training opportunities, and scaling up local economies. There is, therefore, increasing agreement within development and climate science communities that stove replacement programmes can function as a “win-win” solution to pressing climate and development concerns (GTZ 2010). These technologies can be considered what Bumpus (2009) calls “integrated carbon development”. The ability to reduce greenhouse gas (GHG) emissions through ICS programmes has, therefore, meant that carbon financing has flowed to stove projects in order to generate emissions reductions credits and capitalize on their high quality sustainable development co-benefits that can be communicated to buyers (Peters-Stanley et al. 2011). The voluntary offset market has been the prime target for ICS projects because of the ability to create innovative methodologies outside of the CDM, and the ability to gain premium prices for the co-benefits stories that are valued by buyers interested in corporate social responsibility marketing.

Although the development benefits of stoves are clear to see, certifying the carbon reductions created was more difficult. Methodologies under the CDM were not approved until 2007. Subsequent programmes of activities (PoA)—which enable the aggregation of many similar projects under one registered programme—were developed, but more avidly taken up by the voluntary market to scale up its “most wanted” projects, such as stoves (Peters-Stanley et al.

¹² €1 = \$1.3 (December 2011).

2011:31; see table 2 below). For the GS, the technology was a prime candidate for achieving the standard's sustainable development aims. Originating carbon reductions through cookstoves relies on more interaction with local companies and communities using the technology. This meant partnership building and, while creating challenges for capacity building, offered opportunities for communicating the local benefits associated with the creation of the carbon credit. For example, ClimateCare describes its cookstove project online, including photos and comments from local stakeholders illustrating the local benefits it provides (ClimateCare 2011).

Table 2: Examples of stoves projects hosted under specific carbon standard

Standard	Projects in validation or registered	Scale of project / carbon reductions	Countries (examples)	Projected volume of credits from existing and pipeline projects
CDM	20 (0.28% of total projects in CDM pipeline)	Only small scale possible	Nigeria (registered); Nepal (pipeline), Bangladesh, Mexico, Guatemala (CDM PoA pipeline)	0.53 million t/CO ₂ e CERs
Gold Standard Voluntary Emissions Reduction	41 (12.2% of total projects listed on the Gold Standard)	Large scale possible	Uganda, Ghana, Mali (registered); China, Africa as regional focus (pipeline)	2.04 million t/CO ₂ e VERs

Source: Simon et al. 2011; Gold Standard 2011c; UNEP-Risoe 2011. Data as of November 2011.

The improvement in both carbon accounting and communication of benefits and local attributes, through choosing and developing robust projects, has been described as the flight to quality in carbon offset projects. As an asset management company notes, "The popularity of energy efficient cookstove projects has soared as they claim to provide many additional benefits for households in developing countries, allowing users to slash their cooking fuel bills while also cutting air pollution and reducing health risks" (Islan 2011).

The costs of production for these projects, in addition to their development benefits, also contribute to a higher price, given that accurate carbon accounting on the decentralized stoves requires more time and financial investment. As a result of these two factors, GS certification with stoves can fetch between €2-€4 more per tonne than, for example, non-GS certified wind farms.¹³

Local use and monitoring of the technology for carbon credits

Carbon commodities created through stove projects rely on local people using the technology, and the effective monitoring and verification of this. The decentralized nature of ICS technology has a significant bearing on its ability to create carbon commodities for exchange. Unlike a hydro project, which is centralized and generates electrical power connected to a grid, which makes it easy to monitor and to verify its emissions reductions (by displacing fossil fuel burning generators), ICSs are spread over wide distances with variable household cooking patterns and demographics, and rely on identifying whether the biomass being burned is renewable or not.¹⁴ As a result, their ability to be incorporated into standards that commodify carbon reductions is much more complicated (GTZ 2010).

Despite this complexity, project developers like ClimateCare developed new methodologies based on baseline studies and statistical sampling of types of stove users (for example, domestic users such as households and industrial users such as schools). These methodologies relied on local capacity building, joint understanding of the requirements of carbon finance monitoring

¹³ Although specific pricing on these credits is not available, an indication of price would be around €4.5/tCO₂e (\$6/tCO₂e) for non-GS, but Voluntary Carbon Standard certified, credits (Peters-Stanley et al. 2011).

¹⁴ For renewable biomass, there are no emissions savings through more efficient burning because there is no net benefit to the atmosphere as the equivalent emissions are taken back up in new biomass growth.

and reporting, and stove maintenance and replacement programme development (JPMCC and CEIHD 2006). This pattern has been seen in Africa, Asia and Latin America, where carbon reductions—and moreover, significant local development achievements—have been made (Simon et al. 2011). The requirement for larger scale local participation in creating the carbon commodity has also opened space for the renegotiation of local benefits, for example, through a share of the revenue created by the selling of the carbon credits, as a result of the difficult commodification data requirements (Bumpus 2011).

The application of the Gold Standard means, therefore, that project developers can both gain improved prices in the market and build on systemic local benefits, such as development that “builds business and technological capacity in the country” (ClimateCare 2011). As a result, local use values feed directly into the global exchange value: the local use value of stoves as a useful technology is part and parcel of its global exchange value as a carbon commodity. Clearer links between buyers and reducers of carbon are created by labelling the development success stories, as well as by connecting buyers with local conditions by emphasizing the climate and development benefits of the technology. As the Gold Standard website (2011b) notes:

We are proud that our credits command this premium over other standards since it reflects the credibility, honesty, integrity and robustness of the standard and our brand...With sustainable development and environmental co-benefits being maximised and ensured via the Gold Standard’s MRV, investing in quality Gold Standard carbon credits is an investment in your own brand, demonstrating to clients, staff and suppliers sincerity towards environmental and corporate social responsibility.

In Sum

The needs for local monitoring and the scale up of local stove manufacturers and distributors in carbon cookstoves require new forms of carbon market interaction. Incorporating carbon accounting requirements into local systems requires capacity building, finance provision and new governance arrangements to ensure supply of carbon credits, as stoves are maintained and used over time. In this way, local use values are central to creating the global exchange value of cookstove carbon credits. The ability to innovate methodologies in the voluntary market has allowed the scale up of these technologies. By providing flexibility in methodologies and certification to local benefits, premium carbon standards have helped bring pro-poor technologies to the carbon market. Given the “integrated carbon development” nature of stoves, overcoming improving the availability and use of stoves improves both local development conditions and creates profitable carbon credits.

Discussion and Policy Implications

This section provides a discussion of the commodities created, their local social conditions and how these connections can be mediated and improved through capacity building and transparency in reporting.

Discussion

Wiring projects into the wider carbon economy

Localities are wired in to the wider carbon economy through specific projects, technologies and carbon standards. More importantly, projects are influenced by the political economy of global finance mechanisms, which then are mediated by local actors’ interests and abilities to negotiate. These global-local governance arrangements, their mechanisms, requirements and negotiations create both opportunities and constraints for local development through carbon

finance and are important for conceptualizing how global policy is enacted effectively in multiple locations.

Macro-level carbon finance constitutes new forms of North-South interaction and has new material impacts on local social and ecological relations. The case studies here show that pro-community development funds and standards aim to assist CDM compliant projects to convey their development benefits (such as hydro), and on the other, help bring pro-poor technologies into the voluntary market. Global-local governance arrangements are needed to create and effectively commodify the carbon asset: without initial finance premised on a global exchange value, the carbon projects cannot get underway, and without certain local use values (such as generating electricity and using cookstoves) carbon reductions cannot be created.

The influence of carbon finance, however, is not unidirectional. Local agency interacts with global structures of carbon finance, reworking it in local contexts. In the hydro project, for example, the inclusion of a pro-community development fund did not materially change local development benefits beyond local company CSR dynamics. Instead, the political economy of community-company relations defined who would initially receive local development benefits from the project, and then the local agency of communities and the company executives went beyond the stipulations of carbon finance to increase local benefits. Social capital in the community organization, in combination with property rights over valuable natural capital allowed certain communities to directly influence their ability to access benefits from the project and move within—and amend—the political-economic structures that constrained them (Bebbington 2003; Bury 2008). This was, however, not contingent on the carbon connection or inclusion of a pro-development carbon label. In the case of the cookstoves, the project developers relied on local agency and ability to scale up local stove manufacturing economies to create the project and commodify carbon effectively.

We must, therefore, be attendant to the multiscalar, multi-actor dimensions of carbon offsets, and processes that take place outside of the specific action of creating carbon reductions. Local relations between specific actors are integral to understanding how the dynamics of carbon financed projects work. Local level outcomes are reworked both with and without specific reference to global pro-development standards. This approach highlights the importance of addressing the equity implications of how carbon finance as well as other political-economic structures influence interactions between actors along the carbon commodity chain (between global and local scales), and also incorporate structural frameworks that enable local agency to mediate outcomes. These conclusions support other research that broader local institutional arrangements are needed to assist in local development through carbon finance (see, for example, GCD 2011).

Shifting local use values by changing global exchange values

Local conditions are not changed by the buyers being aware of the social conditions behind the creation of carbon credits but it does provide encouragement for the inclusion of social dimensions in a more structured way. For example, community-oriented funding and inclusion of the Gold Standard for the hydro project did not significantly shift local development patterns above business as usual.¹⁵ Although accurately conveying the fact that the project did help local people, the label does not go far enough to illustrate the political-economic negotiations that existed in the local context of creating the project, and the communities that had difficulty in accessing benefits. This is not to say that the project did not have local benefits—it did—the outcome here simply shows that conveying local use values as information in the global exchange value was not valuable enough to significantly change local uneven development patterns. In this way unveiling of the commodity is partial: broader local development benefits are not automatically improved because of an increase in global exchange value.

¹⁵ Although the inclusion of the GS did mean a more structured analysis of local benefits.

The multiple pathways for causation of local development outcomes through carbon finance are, therefore, important considerations. This outcome supports others who show that the unveiling of commodities is not an automatic mechanism for effecting progressive local inclusion, but is a potentially powerful tool in enabling us to understand the reconfiguration of local economies across scales (Dicken and Thrift 1992, in Smith et al. 2002:54). Although there is some correlation between labels and improved social benefits, it is still unclear whether it is a case of the tail wagging the dog: do the labels mean improved local development, or do certain project types and global-local political-economic relationships mean that labels are able to be used? Sterk et al. (2009) note that the value in the GS is that it can help certify projects that already have sustainability benefits; and meta-analyses reveal that labels can have some effect on social aspects of projects (Nussbaumer 2009; Olsen 2007). Likewise, as Bacon (2010:112) notes, Fair Trade coffee governance, like other third party certification programmes, continues to be “a deeply contested, socially embedded process, subject to an array of political economy constraints, personal convictions and path-dependent contingencies”. This study supports this notion and calls for more political-economic analyses, with a specific focus on how the conditions of local carbon reductions are conveyed in global spheres, to unpack the role of carbon commodities in global-local links and community development in specific circumstances.

Policy implications

Local participation in globally financed mechanisms

This analysis notes that the GS provides an upward pressure for sustainability on the market as a whole. However, it shows that it is important to take into account more locally specific uneven development outcomes in projects in order to convey accurately over time the real conditions of production in offsets. This analysis, therefore, supports the conclusion that if global-local carbon and climate finance mechanisms are to fulfil their sustainable development objectives, they will have to address interaction from local people at a systemic and integral way: issues of fairness and equity, whose priorities count, and who wins and under what conditions. A pluralist approach to creating projects, for example, would argue that broader, democratically engaged local social relations would provide a stronger and more sustainable platform for the development of carbon reduction projects and policies, especially where the carbon reductions rely heavily on local participation. These are important implications for broader climate finance mechanisms that create new global-local links (such as internationally funded Nationally Appropriate Mitigation Actions and REDD+; Angelsen et al. 2009).

A focus on political-economic processes

The paper highlights that information on political-economic processes should be integrated into North-South climate finance and could potentially be channelled through improved MRV recommendations. Creating systemic inclusion of local people in the verification of social benefits is important to provide space for local voices to be heard. The “power-tools” of carbon finance – MRV – could be adapted to systematically incorporate reporting on processes for local social development in addition to carbon at the verification stage (Bumpus and Cole 2010), supporting the current GS sustainable development tick box matrices. This would provide an ongoing examination of continuing development benefits with a focus on the political-economic interactions at local, regional and national scales. Independent verification of local dynamics through reporting on local processes would assist, and be assisted by, the formation of strengthened local, regional and national institutions for clean development (GCD 2011). This approach would require international climate finance institutions and project developers to actively invest in the development of local institutions (Adger et al. 2005; Boyd 2009). For example, centralizing the establishment of MRV systems for REDD projects could be complimented by decentralized forest-specific data provided by communities (Agrawal and Angelsen 2009). Others have shown that combining forest standards that include community dynamics and MRV may be useful in creating multiple benefit projects (Merger and Williams

2008). While the limitations of such approaches to MRV must be acknowledged, they may help strengthen local participation while supporting effective carbon reductions.

Meeting in the middle: Meso-level analysis and transparent information

This analysis has shown that for labels to convey local conditions as accurately as possible, transparent information on the political economy of local social relations is important. Thus, political economy analysis must be combined with an actor-oriented approach at micro, meso and macro levels to help foster pro-social effects (that is, local community dynamics, intermediary interactions—project developers, regional NGOs, national government interactions—and global influences). Practically, this means strengthening local, regional and national institutions and including information on processes in carbon MRV. Analytically, a meso level of analysis would complement carbon finance studies on the broad global taxonomic analyses and examinations of local scales, allowing broader analytical comparisons with other projects to identify more general tendencies in the carbon-development interface. This is an important research and policy gap. Providing this level of analysis would help engage national priorities for sustainable development, including local, national and international directions on MRV, and issues that commodities labels tend to ignore (Mutersbaugh and Lyon 2010). Moreover, structuring possibilities for local participation and information generation through carbon standards and regulation would facilitate a broader research-based accountability mechanism for social activity in carbon finance.

The limits and possibilities of pro-development carbon labels

However, aiming to reveal local social relations to the fullest extent possible may render the use of markets inappropriate because of increased transaction costs and inherent uneven development characterized by market expansion. Increases in local participation may provide burdensome transaction costs that reduce incentives for finance and project development. Local development is likely to be more strongly influenced by the type of technology, political-economic patterns and structure-agency interplay than the unveiling of the local benefits of carbon commodities in the market. It is also impossible to convey completely the local conditions of production. As a result, labels could undermine local processes: although they describe local effects, they necessarily cannot fully convey them through associated stories, nor mediate local power asymmetries and dynamics. The fine line between financial conditionality and accountability also needs to be examined in providing equitable communications of local circumstances. Therefore, education at multiple levels on the limitations and possibilities of the carbon markets, and capacity building to effectively engage with climate finance mechanisms, would support the potential for local inclusion and highlight where complementary policies and measures are needed.

In addition to capacity building at multiple local, regional and national levels, more information, accurately collated and presented, may help in the broader sea change toward high quality offsets. Pathways forward need to increase transparency across global carbon finance mechanisms and have broad acknowledgement of the realistic capabilities and limitations of carbon finance in development contexts. In this regard, new media, communications and improved monitoring of local conditions (for example, through technologies and/or information associated with new web technology¹⁶) are interesting avenues for continued research and policy innovation.

Conclusion

Through the lens of global-local linkages and commodification, the paper shows how the market excludes social dimensions, and highlights the possibilities for bringing them back in.

¹⁶ For example, crowd-sourced information and automatic data collection such as the SWEETLab: The Sustainable Water, Energy and Environmental Technologies Laboratory at Portland State University. www.sweetlab.org, accessed on 5 December 2011.

This analysis aims to provide some theoretical inroads and empirical evidence on the difficult trade-off between local sustainable development and carbon reductions, as well as the possibilities to include affected communities in local carbon finance governance (see Bozmoski et al. 2008; Olsen and Fenhann 2008). Moreover, it shows that the local social effects of the global carbon economies must be understood as processes that engage multiple actors and power dynamics, and that new forms of certification incorporate communities and local social relations into global exchange values.

The analysis in this paper shows that although projects can have local development benefits, outcomes can be nuanced by local political economies and technologies. Uneven development patterns are also not conveyed fully in premium carbon or pro-development labelling. Though employing a different theoretical and methodological analysis, this outcome supports others in that certain project types lend themselves to labels; thus the technology or project type is a key driver (Nussbaumer 2009; Drupp 2011). Labels can help provide information, but they do not, and cannot, convey the specificities of local dynamics: there are still local nuances that need monitoring, with a focus on process. The use of pro-development standards, however, is useful in raising the bar for offsets and, more generally, the interactions between global finance, corporate activities and local communities in developing countries. Providing broad systemic opportunities for the inclusion of local agency in mediating the local effect of carbon finance may assist this.

A more inclusive social development component in carbon finance would, therefore, require three “I”s: **information** on benefits and power asymmetries; **inclusion** of local agency by structuring participation through the mandated systems of carbon finance (such as MRV); and **innovation in communication** of participation along the carbon commodity chain. These components would help provide an understanding on how interconnections are mediated by social relations created by the carbon commodity chain, and open pathways for broader participation on who benefits, and why, in carbon and climate finance.

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