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Stakeholder preferences towards the sustainable development of CDM projects: Lessons from biomass (rice husk) CDM project in Thailand

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ABSTRACT

This research applies both quantitative and qualitative methods to investigate stakeholder preferences towards sustainable development (SD) priorities in Clean Development Mechanism (CDM) projects. The CDM's contribution to SD is explored in the context of a biomass (rice husk) case study conducted in Thailand. Quantitative analysis ranks increasing the usage of renewable energy as the highest priority, followed by employment and technology transfer. Air pollution (dust) is ranked as the most important problem. Preference weights expressed by experts and local resident are statistically different in the cases of: employment generation; emission reductions; dust; waste disposal; and noise. Qualitative results, suggest that rice husk CDM projects contribute significantly to SD in terms of employment generation, an increase in usage of renewable energy, and transfer of knowledge. However, rice husk biomass projects create a potential negative impact on air quality. In order to ensure the environmental sustainability of CDM projects, stakeholders suggest that Thailand should cancel an Environmental Impact Assessment (EIA) exemption for CDM projects with an installed capacity below 10 MW and apply it to all CDM projects.

1. Introduction

As part of the international response to climate change the United Nations Framework Convention on Climate Change (UNFCCC) has established an international policy framework for reducing greenhouse gas emissions. Adopted at the third Conferences of the Parties (COP-3), the Kyoto Protocol aims to stabilization atmospheric concentrations of greenhouse gases at a level that would prevent dangerous climate change. However, the costs of reducing GHG emissions vary across countries. In order to achieve cost effective emission reductions, the Kyoto Protocol incorporates three flexibility mechanisms based on the principle that GHG emission reductions anywhere in the world will ultimately have the same effect on the atmosphere. Consequently, it is more cost effective for Annex I (developed) countries to reduce GHG emissions in other developing countries rather than at home. The Clean Development Mechanism (CDM) is one of these flexibility mechanisms. The CDM allows Annex I countries to invest in emission reduction projects in developing countries. CDM projects have twin objectives. Firstly, to assist non-Annex I countries achieve Sustainable Development (SD). Secondly, to assist Annex I countries achieve their emission reduction targets in a cost effective way. A host country Designated National Authority (DNA) is directly responsible for assessing the sustainability of CDM projects. This duty is clearly defined in the Bonn Agreement, which states that "*The Conference of the Parties agrees to affirm that it is the host Party's prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development*" (UNFCCC, 2001). Therefore, a CDM project's contribution to SD is interpreted and assessed by the host country. Host countries develop their own SD criteria for assessing CDM projects. There are no common international standards for the host country approval processes and the development of SD criteria. In contrast to GHG emissions, whose assessment and monitoring are standardized, the SD criteria for approval of projects are not clearly defined. Consequently, the host countries' duties to assess the SD benefits of CDM projects are inconsistently applied and SD criteria vary widely.

Several studies have now concluded that the SD objectives of CDM project are not clearly interpreted by many host countries (Brown et al., 2004; Schneider, 2007; Sterk et al., 2009). Sterk et al. (2009) find that only 15 countries have their own SD criteria for assessing CDM projects. More importantly, the relative importance of individual SD objectives is vague. Stakeholder preferences towards the SD of CDM projects are not explicit, and are left to the host countries to interpret. Making these preferences explicit would help reduce conflicts and help develop consensus as different stakeholders can evaluate their own proposals from

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the others' preferences (Pascoe et al., 2009). Finally, the contribution that CDM projects make towards SD has been widely debated (Burian, 2006; Kolshus et al., 2001; Michaelowa, 2005; Nussbaumer, 2009; Olsen, 2007; Olsen and Fenhann, 2008; Schneider, 2007; Sutter and Parreno, 2007).

Given this context, an investigation of stakeholder preferences towards the SD of CDM projects is clearly needed. Moreover, there is a need for more specific research investigating how the CDM contributes to SD. This research tries to investigate these issues using a case study of a biomass CDM project in Thailand.

2. Literature review

Since the late 1980s Sustainable Development has been a central plank of global environmental and development policy. While it has apparently achieved universal acceptance, and despite the numerous interpretations of SD found in the literature, it remains an elusive concept and its implementation has proven difficult (UN, 2010). Some interpretations of sustainability are simply about human survivability and the avoidance of ecological disaster, while other commentators give a more complex definition often based around the maximization of intergenerational utility (Jamieson, 1998). The most widely accepted definition, given by the World Commission on Environment and Development (WCED, 1987), defines SD as "*development that meets the needs for the present without compromising the ability of future generations to meet their own needs*". While the WCED definition is widely accepted its implementation by policy makers indicates a variety of interpretations.

According to UNDP (2006), there are two aspects to a CDM project's contribution to SD:

- CDM projects must reduce GHG emissions without causing any social, economic, or environmental harm.
- CDM projects must provide positive economic, environmental, and social benefits, not just greenhouse gas emission reductions.

The UNDP interpretation implies Pareto efficiency as an appropriate decision criterion, i.e. a project is only acceptable if it does no harm. This suggests that the UNDP takes a '*strong*' interpretation of SD (Dobson 1996). Alternative, '*weaker*', cost/benefit approaches would accept some negative impacts provided there is a net benefit.

Host countries interpret UNDP guidance in different ways. Some countries do not allow negative ratings for any of their assessment criteria, e.g. Cambodia and Indonesia. The Cambodian DNA Assessment Procedures state that "*The absence of negative impacts for each criterion is considered to be the minimum threshold with which project proponents must comply*". By not allowing any negative ratings, the Cambodian DNA is taking a relatively strong position, which implies Pareto efficiency (Burian, 2006).

By contrast Malaysia and Thailand may permit projects with negative ratings, for any single sustainability criteria, provided the overall score of the project is positive. This weaker interpretation accepts projects that provide a net gain, which in turn implies a cost/benefit trade-off.

There have been several studies of the sustainability assessment of CDM projects, but the research on stakeholder preferences towards the SD of CDM projects is limited to two studies conducted by Sutter (2003) and Nussbaumer (2006). Sutter's (2003) work involved stakeholder surveys in South Africa, India, and Uruguay. Sutter used direct weighting and the Analytic Hierarchy Process (AHP) to assess sustainability preferences. The Uruguayan stakeholder survey was conducted in a workshop in which 36 CDM stakeholders participated. The South African and Indian surveys were conducted through the face-to-face interviews and electronic questionnaires. Each of these two countries got around 30 responses from government, industry, NGOs, and academia. Indian stakeholders rated replacing fossil energy resources as the highest preference, whereas South African stakeholders rated employment generation as the highest preference. Another stakeholder survey in Uruguay found that water resource (water quality and efficiency in the use of water) was the highest ranked preference. However, these three surveys only contacted experts and did not involve local residents from the CDM areas. Outside the confines of CDM research stakeholder surveys on the sustainability preferences routinely include experts and local residents (Ananda and Herath, 2003; Kontogianni et al., 2001; Koontz and Hoag, 2005; Nielsen and Mathiesen, 2006; Strager and Rosenberger, 2006; Wattage and Mardle, 2005). While interesting, we would argue that these surveys do not adequately reflect the range stakeholder perceptions of SD. Indeed Sutter (2003) gives recommendations for wider research on the preferences of CDM stakeholders. Firstly, he recommended that further research includes local residents at the grass-roots level and examine whether the sustainability preferences of experts and local residents are different. Lastly, he recommended that future research is conducted at the project level because large scale studies tend to produce equalized weightings potentially hiding conflicting opinions.

More recently, Nussbaumer (2006) conducted a survey on the sustainability preferences of CDM stakeholders. Nussbaumer used direct weighting to assess the sustainability preferences. This survey was conducted through electronic questionnaires with only 11 responses (5 from Annex I and 6 from non-Annex I countries). The results were not statistically relevant with no strong evidence of stakeholders groups favoring one or other SD criteria or category. Furthermore as SD principles and criteria are used in non-Annex I countries, this survey should not have included participants from Annex I countries.

There is clearly a need for further research on the stakeholder preferences towards the SD benefits of CDM projects. The research presented here follows recommendations of Sutter (2003) to investigate the sustainability preferences of CDM stakeholders, particularly local residents.

3. Background on a case study: biomass CDM projects in Thailand

Thailand signed the Kyoto Protocol on 2 February 1999 and ratified it on 28 August 2002. As a non-Annex I country, Thailand has no commitment to reducing GHG emissions and is eligible to host CDM projects. The Thailand Greenhouse Gas Management Organization (TGO) is the Designated National Authority for CDM (CDM-DNA). As Thailand's energy policy aims to increase the use of renewable energy a high priority is given to the renewable energy CDM projects.

Thailand has a high potential for biomass energy, especially the rice husk based energy, and current government policy is to encourage the use of biomass energy. Thailand has recently announced a 15-year Alternative Energy Development Plan (AEDP) for 2008–2022. The AEDP aims to increase the share of alternative energy in final energy demand 20.3% by 2022 (DEDE, 2007). The AEDP, estimates renewable electricity generation potential of 57,290 MW; solar power has the highest potential, followed by biomass and wind (see Table 1). Total biomass capacity is estimated to be 4400 MW of which 1610 MW has been developed. Biomass energy is expected to provide in excess of 60% of the alternative energy mix. The AEDP identifies CDM projects as a key tool to help Thailand achieve its target by