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# Cooperative Environmental Governance and Waste-to-Energy Technologies in Asia

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## Abstract

The concept of cooperative environmental governance has been proposed as a means of increasing citizens' participation in environmental policy and technological choice in order to make policy processes more deliberative and socially inclusive. This paper critically analyses the concept in relation to cases of waste management and waste-to-energy investment in the Philippines and India, and especially the choice between the technologies of incineration, pyrolysis and biomethanation. The paper argues that, despite much progress towards local inclusion, there is still too much optimism about the ability for local people to influence technological choice, and powerful actors can shape the identities and roles played by local people. Consequently, cooperative environmental governance needs to incorporate a greater political understanding of how and by whom technological debates are framed, using insights from discursive politics.

**KEYWORDS:** waste management, cooperative environmental governance, India, Philippines, waste pickers

## Introduction

In recent years, many observers have argued that environmental policies, and the choice of environmental technologies, would need to include the participation of local people (e.g. Fischer 2001). The concept of cooperative environmental governance (CEG) has been proposed as ways to allow local people to participate in technology and environmental decisions through forming collaborative partnerships with the state or investors (Glasbergen 1998). In many ways, CEG is an extended form of

participatory technology assessment, which also seeks to consult and include people in the selection, use and implementation of technologies (Pellizzoni 2003).

This paper, however, argues that the concept of cooperative environmental governance is still too optimistic in assuming local people can shape environmental and technological decisions. The paper argues that rather than focus on the ability for local people to participate in debates about technology, the concept should acknowledge how far forms of participation are shaped by more powerful actors. The paper critically analyzes cases of waste-to-energy investment and renewable energy technologies in the Philippines and India.

### **Cooperative environmental governance and waste-to-energy technologies**

Cooperative environmental governance (CEG) is a general name for environmental policymaking that includes active participation from citizens, and which tries to form partnerships between different sectors of citizens, the state and business (Glasbergen 1998). The purpose of cooperative environmental governance is to overcome the necessarily conflictual nature of negotiations, and to seek instead a positive negotiating space between investors and citizen groups. It is similar to other concepts such as ‘civic environmentalism’ (John 1994) or ‘pro-poor public-private partnerships’ (Plummer 2002), in which citizens have provided information, monitoring, or political pressure to enact new and more flexible forms of regulation or service provision. In Vietnam, for example, O’ Rourke (2004) describes how ‘community-driven regulation’ led to greater consultation about and monitoring of environmental investment. CEG has been adopted within World Bank practice under the so-called ‘Greening Investment’ initiative (World Bank 2000), based on voluntary

partnerships to promote community development involving the company, civil society organizations and local and/or central government.

CEG can be compared with some forms of participatory technology assessment (PTA), which seek to allow diverse stakeholders, especially technology users, to shape technological policies and investment. Pellizzoni (2003), for example, lists two main types of PTA, involving the participation of lay citizens in identifying technological needs, and secondly, in allowing consultation between different organizations and state agencies. CEG for technology investment can also reduce the costs for investors by achieving local maintenance and cost recovery. In Biratnagar, Nepal, for example, the involvement of local citizens helped achieve higher levels of environmental services and the diffusion of new waste management technologies, while both reducing the costs of public policy objectives (Plummer and Slater 2001).

Despite this potential, however, critics have urged greater attention to how far CEG can achieve local participation. For example, Evans (1996) has argued that local collaboration may be undermined by ‘embeddedness’ – or the existence of influential leaders who are members of both state and ‘local’ groups, or businesses and public collaborators. Arguing from the perspective of discursive politics, Fischer (2001) has suggested that the analysis of local participation in technology decisions is meaningless unless there is attention to how both technology choices and participation are framed, and by whom. Hajer (1995) has also argued that local disputes or decision-making usually are ‘epiphenomena’ of wider discourses, which are rooted in older social divisions rather than specific concerns about environment or new technologies. In particular, Hajer suggests that the concern about epiphenomena may be strengthened when local actors – such as the state and investors – form ‘discourse

coalitions' by agreeing on the framing of complex environmental disputes for their mutual benefit. Consequently, there is a need to consider whether local citizens can shape technology choices, or if the roles and identities claimed by citizens have been shaped for them.

Such questions are increasingly relevant for the case of investment in waste-to-energy technologies in developing countries. Waste-to-energy investment is increasing throughout the developing world because of the rising dilemma of solid waste, especially in cities, and the need for local energy. At its simplest form, it involves the mass-burn incineration of agricultural or municipal waste in order to power turbines for electricity generation. This kind of incineration, however, is criticized for providing both toxic air pollution and ash, and – arguably – for encouraging an uncritical attitude for the production of waste. A more recent form of incineration is pyrolysis, which chemically decomposes organic materials by heat in the absence of oxygen typically under pressure and at operating temperatures above 430°C (800°F). An alternative to incineration or pyrolysis is biomethanation (or anaerobic digestion), which involves no combustion, and instead collects methane by breaking down organic waste using bacteria in confined spaces (Speight 1996). The capture of methane contributes to climate change policy because methane has 23 times the global warming potential of carbon dioxide. Under the Kyoto Protocol's Clean Development Mechanism, investment in climate-friendly activities in developing countries can produce certified emission reduction units that can be sold to countries with firm emissions reduction targets.

Waste-to-energy is relevant to CEG for various reasons. From a contractual viewpoint, it offers opportunities for partnerships between citizens and investors for different tasks such as collecting waste and providing new technologies. Partnerships

between citizens and investors may provide pro-poor opportunities for employment, as well as local waste management that can assist development. CEG may provide further opportunities for training citizens about new technologies, and hence overcome some long-term barriers to technology transfer. CEG also allows different perspectives about waste management to be voiced. For many citizens, waste-to-energy in any form provides a pragmatic solution to both waste and energy, and hence may appeal to so-called techno-centric environmentalists, who seek managerial or technological solutions to environmental problems. Yet, this viewpoint may be opposed by some eco-centric citizens and NGOs, who see waste-to-energy as potentially polluting, and a legitimization of waste because it reduces incentives for recycling or composting. To date, the incineration of municipal waste for energy is still not recognized as a permissible means of greenhouse gas mitigation under the United Nations Framework Convention on Climate Change (UNFCCC). Moreover, experience has also shown that some incinerators may only operate if diesel fuel is added to waste, which is seen to defeat arguments that waste-to-energy is energy efficient.

In response, supporters of waste-to-energy have argued fears of emissions are exaggerated because all incinerators have to abide by local environmental regulations or risk being shut down. Furthermore, new forms of incineration – such as pyrolysis – reduce emissions significantly because they use non-aerobic combustion, and biomethanation involves no combustion at all. The impacts on local waste pickers is, however, less uniform. There is no doubt that incineration or pyrolysis will reduce livelihoods opportunities because waste has to be owned and transported by the incineration company, and much incineration requires some proportion of paper and plastic to produce a sufficient calorific content for incineration to occur. However,

biomethanation can only proceed if the inorganic fraction is removed, and hence still allows opportunities for recycling by waste pickers. Moreover, biomethanation provides a residual sludge that can be used for manufacturing compost.

The selection of different waste-to-energy technologies therefore offers different styles of waste management, and may impact diversely on local people. CEG has the potential to both include local citizens in new technology investment and to represent their concerns about technologies. But to date, little research has been done on how far CEG can enhance representation of local people. The following section summarizes some examples of waste-to-energy investment in the Philippines and India. The examples focus on recent attempts to install new forms of waste-to-energy technologies, involving CEG or partnerships between citizens and investors, which have been proposed under the Clean Development Mechanism. The research is based on interviews with communities, investors and state officials in India and the Philippines, and collection of associated media reports and documentation. An earlier paper (Forsyth 2005) focused on the deliberative governance of partnerships between citizens and investors. This paper looks more closely at the implications for technology choice.

## **Waste-to-Energy Investment in the Philippines and India**

### *(i) The Philippines*

The Philippines recently passed two pieces of national legislation that have sought to enhance waste management. In 2001, there was a ban in incineration of waste, and in 2001 a new law made it mandatory for households and businesses to segregate waste into organic and inorganic sections. The segregation law was inspired by deep concerns about the generation of waste, most graphically illustrated by the vast waste dumps outside Philippine cities, and the shocking event in 2000 when some 200 waste

pickers were killed in a ‘landslide’ of garbage at the Payatas waste dump outside Manila. The ban on incineration of waste, which was particularly influenced by the campaign of the Greenpeace NGO that had set up an office in Manila in 1999, was particularly seen as a victory for environmentalists.

The importance of this law to environmentalists also apparently influenced attitudes to waste-to-energy in general. When interviewed, many environmentalists, and especially local representatives of Greenpeace, claimed that *all* forms of waste-to-energy (including biomethanation) should be banned because they legitimized the production of waste. At times, these statements seemed to reflect a lack of awareness about biomethanation. For example, one campaigner at Greenpeace<sup>1</sup> – when pressed – admitted s/he did not know what biomethanation (or anaerobic digestion) was, but insisted that it had been banned at some time in Europe (in fact, biomethanation has never been banned). Other campaigners were also unsure about the nature of biomethanation, but believed that all waste-to-energy technologies should be discouraged because they weakened the eco-centric objective of a ‘waste-free society’. Government officials who were interviewed did not generally treat such statements with respect. One employee in the office dealing with public–private partnerships stated:

*People don’t realize that burning at low temperature is worse than burning at high temperature, yet the ban on incineration in effect increases the incentives to burn at low temperatures. But how do you explain this to the public?*

Another official in the Solid Waste Management Association of the Philippines said:

*The problem is in the perception. Waste- to- energy here is largely thought of as incineration, and because of old experience elsewhere, the desire was to ban incineration, and so it is in the law. It was crazy to ban the technology ... we should have looked at the objectives the technology was meant to serve. But the campaign of Greenpeace was very strong. Senator Mercado was the chair of the Committee on Environment. His*

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<sup>1</sup> The identities of speakers are kept confidential.

*chief of staff became chair of Greenpeace in Philippines. So, the extremist position of Greenpeace unfortunately found welcome ears in Congress. All misconceptions about the technology developed after that.*

It was clear from discussions with environmentalists that the ban on incineration was seen in symbolic terms, as a victory for environmentalism generally, rather than as a specific commentary on technology choice alone. For example, the author of this paper was surprised on three occasions to be (falsely) accused by environmentalists to be a representative of European companies trying to promote new pyrolysis-based forms of incineration when he was discussing biomethanation. On one occasion, it was also clear that the environmentalist being interviewed was suspicious of foreign technologies in principle, and wanted to emphasize the resourcefulness of Philippine techniques:

*...you do not have to use complicated methods in converting organic waste back to compost ... you don't need complicated ... state of the art [technology],... because the Philipinos have been converting waste to compost for many ... years now.*

Such views were also found expression in some specific case studies of waste-to-energy investment. For example, the town of Baguio, in the northern island of Luzon, is situated in a mountainous area and its waste dump risks causing lowland water pollution. During 2000–2001, a US-based investor sought to establish a biomethanation plant that would process organic waste and allow recycling of other waste. The proposed project would employ existing waste pickers at the dump in order to segregate waste, and provide the separation of organic and inorganic waste necessary for biomethanation. The investor saw the employment of local people as a shrewd way to reduce costs (by using the collectors to segregate waste) and to gain support of the local government by demonstrating the local developmental benefits of the project.

The proposal was well received by the local municipality. However, a local NGO in Baguio criticized the project, arguing that waste-to-energy projects in general legitimized the creation of waste, and, in Baguio, they would threaten the livelihoods of some 150 waste collectors who lived in and around the waste dumps, and many of whom would not be employed at the waste-to-energy plant. In addition, the NGO claimed that the waste-to-energy project would prevent the manufacture of compost, which they considered to constitute a main part of the local livelihood. In response, the investor argued that the plant would produce organic (non-recyclable) waste, and that compost made from biomethanation was better than traditional compost from aerobic methods. In return, the NGO argued that ownership of the compost would still lie in the hands of the company, and hence would restrict livelihoods. As a result, the NGO urged a return to a system of waste segregation at dumps (i.e. prior to the national household waste legislation urging segregation into organic and inorganic within households and firms), because it saw segregation at dumps to be in the best interests of waste pickers. It is also worth noting that the possibilities of using methane capture to earn climate change credits were not perceived by the NGO or the local government.

Meanwhile, the waste pickers' own concerns (according to an interview with their local leader<sup>2</sup>) were that any changes to waste dumps would threaten livelihoods by removing the land the pickers were informally holding as houses, and as areas to raise pigs. The waste picker leader claimed that working for the investor in the waste-to-energy plant was attractive if jobs could be guaranteed. He worried that just one family member working in the plant would be insufficient. Yet, living near the dump also encouraged illnesses such as asthma, bronchitis and influenza.

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<sup>2</sup> The waste picker representative was a male in his 50s who was also the acting head of the local *barangay*, or municipal sub-district. He was a retired administrator whose family had conducted waste recycling for years in order to earn supplemental incomes.

The example of Baguio, however, stands in contrast to the experience of the city of General Santos in southern Mindanao. Here, the same US investor approached the local government to build a large biomethanation and waste recycling facility, and received strong support. In this location, too, the investor sought to train those already engaged as waste pickers and other low-income citizens to work at the plant. The city has a variety of features that allow fast negotiation: it is a site of tuna canneries, piggeries, and fruit plantations that create a regular supply of organic waste. Furthermore, the region has a reputation for being a centrally managed growth zone, with various initiatives for accelerating investment and organizing public services. By 2004, the proposed biomethanation plant here was likely to proceed. Some local factories and entrepreneurs, however, criticized the proposed plant because they feared the financial benefits of the plant might be restricted. The investing company responded by inviting these businesses to locate within the recycling plant area itself or to contract to use the electricity generated. For example, a local pulp and paper factory is considering locating within the plant area in order to gain access to recycled paper; a local piggery is considering using the electricity generated in order to treat wastewater.

*(ii) India*

India may be considered a valid country to consider in tandem with the Philippines because they have large markets for waste-to-energy projects, a large urban poor population, and both countries are industrializing quickly. Like the Philippines, India passed national legislation encouraging municipalities to segregate and compost household waste. (The Municipal Solid Waste Rules, were passed in 2000, and became effective in 2004, but arguably have not yet been implemented). Waste-to-

energy projects also have a poor reputation in India. For example, in 1984, the Ministry of Non-Conventional Energy Sources (MNES) installed a waste incinerator using Danish technology as a pilot project to demonstrate waste-to-energy in Timarpur, Delhi. Unfortunately, the project miscalculated the moisture content of the available waste in Delhi, and consequently the technology did not work unless diesel was added to the waste. According to reports, the incinerator operated for less than a month, and its last day of operation was when the project was visited by the then-Prime Minister, Rajiv Gandhi, after which the incinerator was closed down, and the Danish suppliers issued a lawsuit for failure to implement the agreed contract.<sup>3</sup>

Unlike the Philippines, however, debate about environmental concerns in India is less dominated by international NGOs such as Greenpeace. One campaigner for an Indian NGO explained s/he had resisted working with Greenpeace:

*Historically, Greenpeace has had problems around the world when it starts working with local groups. Because of the way it is constructed, it needs to occupy space of all sorts in order to justify its funding and its programs. So it needs to be a dominant player. Now this is not always well taken by local players. ...I think it is just as much as a cultural issue inside Greenpeace as it is outside Greenpeace. ...Greenpeace's great strengths are that it is able to internationalize an issue...*

Yet, like in the Philippines, government officials and financiers in India heavily criticize popular discussions about the perceived problems of waste-to-energy investment. For example, one consultant working for an environmental financier said:

*We have received letters from NGOs saying that all sorts of waste to energy projects are bad. So these people came to my office and I said, 'Do you know what you are talking about?' and they said, 'Yes, we do.' So I said to them, 'Can you demonstrate to me how? Let's say your problem is biomethanation, ... can you tell me how biomethanation can actually cause environmental damage?' They said, 'Yes, we can do this.' But after talking to them further, I told them, 'No, your case makes no sense,' and they began to see what I was meaning.*

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<sup>3</sup> Source: interviews with environmental NGOs, the Centre for Science and Environment, Delhi, and Toxics Link, Delhi.

The attitude to including poor waste pickers in waste-to-energy decision-making, however, strongly varied in different cases. One large biomethanation plant in Lucknow, in the northern province of Uttar Pradesh, opened in 2003 and actively employed waste pickers by allowing them to segregate organic and inorganic waste, and to remove and recycle valuable papers and plastics. Uttar Pradesh has a reputation for assisting the urban poor, especially those of low caste, commonly engaged as waste pickers. The plant, owned by an Asian-based company with international shareholders, generated 5 megawatts of electricity from between 400–500 tons of municipal organic waste per day. The company works in collaboration with an NGO, Exnora (standing for ‘Excellent, Novel, Radical’), which specializes in working on waste management issues, and even assists the NGO by buying bicycles for waste pickers working for the organization (Anand 2003). A company representative said:

*We don't want to upset the existing social system. Our main income comes from power, fertilizer and carbon credits. The recyclable income is not significant to us, but it is significant to the society.*

But this plant closed in December 2004 allegedly because of an inability for the Municipality to supply sufficient organic waste of a high enough standard. Critics claimed this failure proved that the underlying finance and principle of waste-to-energy are not yet feasible (Krishna 2005). This failure has further undermined the image of waste-to-energy in India, although the ability to find a consistent supply of waste may allow future projects to continue.

This case contrasts with the case of a proposed investment in pyrolysis waste-to-energy in Chennai (Madras). (The technology was referred to as SWERF: Solid Waste to Energy Recycling Facility). Chennai was the site of the original Exnora group, which hired waste pickers (or so-called ‘street beautifiers’) to collect household waste in the 1980s. In 2000, however, the local Chennai government

replaced municipal services for waste collection with a new private-sector contract, with the multinational waste collecting company, Onyx, including some streets previously serviced by Exnora. At the same time, an Australian investor approached the Chennai government to establish a pyrolysis plant at one of the city's larger waste dumps. This time, the investor did not seek to hire local waste pickers, but invoked a new discourse that it is unacceptable to allow people to earn livelihoods in this way. A company representative said:

*...there is no manual handling of raw garbage under [this technology]. I am proud of that, and the company is proud to say that we have no handling of raw garbage. Use people to hand garbage? Like hell! Not on my watch. If you want to perpetuate the system where human beings handle other people's raw garbage then I refuse.*

Attractive as this statement is, of course, it is possible that it was influenced by the company's need to maintain a high calorific content in the waste content by restricting the removal of recyclable material. Various activists in Chennai opposed the pyrolysis plant. Exnora, for example, felt it threatened livelihoods of street beautifiers. The Pollution Control Board of the municipality, considered pyrolysis to be an unproven and potentially polluting technology. In 2003, the proposal was eventually turned down by the Municipality and withdrawn by the investor.

### **Discussion: Implications for Cooperative Environmental Governance**

The cases from the Philippines and India briefly discussed above have attempted to show how waste-to-energy technologies have been discussed as options for waste management, and how far these debates have moved on to provide the basis for cooperative environmental governance (GEG). The experiences of both countries, however, indicate that local discussions about technologies have been influenced by national contexts and by political concerns that cannot be reduced to technologies

alone. Moreover, there are contractual difficulties and complexities that have apparently not been addressed by CEG.

In the Philippines, implementation of new technologies is influenced by the national anti-incineration legislation, which is also seen to be an indicator of a fragile civil society that must be protected against attempts to undermine this law. Furthermore, the debate about energy or waste technologies is influenced by discourses of nationalism and tradition. In the case studies, two national NGOs protected local practices of compost making and recycling because Philippine people had done these for long periods, and international investment was not needed to advance them. The consideration of climate change policy as a factor in waste management was not considered by anyone other than international investors.

In India, national legislation relating to waste-to-energy and incineration is less prominent. Local governments have apparently had more influence on shaping the terms for CEG than actions by citizens or poor waste pickers. In Lucknow, the Uttar Pradesh local government and company were happy to seek roles for local people in a biomethanation plant, but this failed apparently because of the inability of the Municipality and the waste pickers to supply sufficiently high-quality waste. In Chennai, Tamil Nadu, the local government seemed less concerned to maintain the locally inclusive waste management conducted by the NGO, Exnora, and was instead keen to allow an international investor to plan a pyrolysis plant. This technology was eventually rejected because of concerns about finance and technological feasibility. Nationalism affected some environmental debate in India when campaigners questioned the legitimacy of Greenpeace as a representative of local interest. In the Philippines, on the other hand, campaigners and some politicians claimed that Greenpeace had done a good job in promoting and empowering local civil society.

So, how do these case studies impact on CEG and the inclusivity of local people in the selection and implementation of technologies? Evidence suggests local states, investors, and national NGOs are more influential than local people in influencing technology choice and the style of CEG. In the Philippines, local governments in Baguio and General Santos had deliberately sought ways to implement biomethanation technologies in ways that were locally inclusive. But in Baguio, a local branch of a national NGO had campaigned to stop this on grounds that it would undermine waste pickers' livelihoods. In India, the state of Uttar Pradesh has a reputation for assisting people of low caste.

Investors in both countries responded by seeking agreements with local governments to suit individual preferences. The roles played by local people in all cases studied were not defined by the people themselves, but by an alliance between local governments and companies. In Baguio, General Santos and Lucknow, it suited investors and states to seek roles for waste pickers. In Chennai, however, the local government and the investor apparently were keen to exclude this involvement of people. These differences show the influence of different environmental values and discourse coalitions, as defined by Hajer (1995). In both the Philippines and India, different actors harnessed various approaches to the urban poor to enhance their own political objectives and their preference for different technologies, rather than to empower the poor and enhance their participation in technology choice.

Has CEG impacted on the costs of investment and technology transfer? Evidence suggests that large-scale progress has not yet occurred. In the Philippines, experience is mixed: biomethanation has only been successfully adopted in the southern city of General Santos, where relationships with workers are largely

controlled by the local state. Elsewhere, opposition to waste-to-energy in general has prevented widespread adoption of this technology. In India, CEG failed to achieve long-term supplies of waste for the Lucknow plant. National and international finance may be used to ensure these contractual arrangements, or to train waste suppliers more effectively. The contractual, versus collaborative, aspects of CEG are clearly poorly developed in these case studies for larger projects.

## **Conclusion**

Cooperative Environmental Governance (CEG) is an important and growing way to increase public participation in environmental and technology policies. This paper, however, argues that CEG needs to be seen more critically. Examples of investment in waste-to-energy in India and the Philippines involving CEG have shown that decisions about technology and investment remained largely within the hands of local governments and investors, and were influenced by national or international NGOs, rather than by local citizens. Usually, these actors adopted norms of environmentalism and social justice that were not always shared by local people. Indeed, these actors tended to represent the urban poor in ways that suited their own agendas rather than empower them to speak on their own behalf. Moreover, many attempts to introduce new climate-friendly forms of waste-to-energy through biomethanation were opposed by NGOs, or proved to be too difficult to achieve successful long-term contractual arrangements between citizens, the state and investors.

The discussion above does not warrant the conclusion suggest that CEG or waste-to-energy technologies should be abandoned in the context of in developing countries. Rather, both should be considered critically. Building new inclusive arenas that bring together actors with different political power and perspectives will always be difficult and cannot be achieved overnight. Achieving sustainable livelihoods for

poor people and installing new environmental-friendly technology must not be based on assumptions about different technologies, but rather on creating forms of discussion and collaboration that can represent citizens' views and provide effective contractual arrangements at the same time. A first step to doing this is to acknowledge that CEG does not necessarily provide a local arena for decision-making, but that it frequently allows wider norms about environment and politics to be replicated.

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