



**Challenging traditional logics of energy planning: a Capability  
Approach analysis of a Grassroots Innovation in the Ecuadorian  
Amazon**

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## Challenging traditional logics of energy planning: a Capability Approach analysis of a Grassroots Innovation in the Ecuadorian Amazon

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### ABSTRACT

Small-scale renewable energy technologies can be Grassroots Innovations (GI) towards sustainable development. But developing grassroots initiatives is not an easy process. Through the lens of the Capability Approach, we look at an energy-based experience in the Ecuadorian Amazon. Under this approach, and conceiving GI as processes where peoples' real options expand, we explore the social, environmental and personal conversion factors that are limiting the development of GI in the Ecuadorian energy field. The study reveals that energy-based GI initiatives in Ecuador are constrained by power relationships between local and national energy actors, complex geographical conditions of the rural communities and the specific skills need it to lead the initiatives. We discuss the limitations of alternative ways of doing energy planning oriented to challenge traditional logics of energy, territory and society relationships.

### INTRODUCTION

Energy is considered essential for development; not only is a fundamental part of the development policies (so as strategies to provide energy access), but it also shapes society and culture (Acosta, Ariza-Montobbio, Venes, Lorca, & Soley, 2014). Renewable energies have been widely employed in development energy projects in different countries and contexts (for exemple, Barnes, 2011). These small-scale energy alternatives have been distinguished for being sustainable technologies. Some cases where these technologies are integrated into community projects are considered as Grassroots Innovations (GI); bottom-up initiatives generated in response to the interests of the communities involved which promote sustainable development and arise from a social need and an ideological commitment. However, developing a GI initiative is not an easy task. Among other requirements, it entails a supportive structural context and financial resources. The influence of a GI depends on its territorial, national and global connections; on how the action at the local level links with higher-level policies (Seyfang & Smith, 2007).

What are the factors that limit the framework within which GI in the rural energy field could be developed? This is the question we are trying to address in this paper, looking at an energy-based initiative in the Ecuadorian Amazon through the lens of the Capability Approach (CA). This GI, called the Morona Santiago's Energy Observatory (MSEO), was an initiative that involved institutional energy actors and civil society. It was addressed to promote appropriate energy technologies for the diverse realities of the indigenous communities. It was an alternative way of doing energy planning based on the indigenous populations' energy needs and aspirations. But after almost three years being functional, and despite its transformative

potential, this initiative stopped working. We assume that the CA provides us with the conceptual framework required to evaluate this GI and enables us to identify the factors that limited its continuity; contributing all together to the discussion of a bottom-up way of doing energy planning.

Our investigation goes through the results of an action research process carried out while we were part of the NGO team that supported the MSEO experience from 2012 to 2015. We followed a qualitative and triangulated research strategy with a participatory approach, combining participant observation with in depth interviews and documentation research. We also used an ethnographic approach where we were able to interpret how the initiative behaved based on long-term participant observation as insiders of the experience.

This paper approaches these issues firstly by analyzing the paradigms that have framing the energy planning logics, particularly in the development sector. We describe some other energy planning proposals that are currently emerging, and we focus on those promoting decentralized renewable energy systems. We then explain the potentials and challenges of GI and some key concepts of the CA and the possibilities it poses for GI initiatives analysis. Next, we present the methodology followed in our study and finally, we discuss the MSEO initiative and identify its limitation factors.

## **BOTTOM-UP ENERGY PLANNING AND DECENTRALIZED RENEWABLE ENERGY SYSTEMS**

Around 1.300 million people in the world have not access to electricity and 2.600 million depend on fossil fuel-based energy sources to satisfy their cooking needs (NN.UU., 2014). Rural electrification became a challenge for impoverished countries due to its potential to contribute to the Millennium Development Goals (MDGs) (Shyu, 2014). The Sustainable Development Goal (SDG) number 7 approved in the United Nations new Development Agenda in 2015 states: “ensure access to affordable, reliable, sustainable and modern energy for all” (NN.UU., 2015).

However, as energy policies are traditionally build as sectorial strategies from the development policies, energy production has been based on the growing demand, usually driven by large consumption areas (Bertinat, 2013). Energy planning logics have been thus oriented towards the centralization of the generation, transformation and distribution of energy processes; mainly towards the centralization of decision-making processes. Energy has been then relegated to a technical arena, resulting in a major concentration of power (Bertinat, Chemes, & Arelovich, 2014). These logics are precisely sustained on the dominant development discourse, being economic growth its basic insight (Mathai, 2012). This is why some academics and also some civil society sectors, which are questioning the dominant energy system, defend new ways of energy planning where generation and consumption of energy are not ends but means to promote the achievement of certain basic goals valued by people and societies (Bertinat, 2013; Mathai, 2012). They underline the need to understand energy as a right instead of conceiving it as a mechanism of getting out of poverty (Bertinat et al., 2014) and also, to reflect its role in bringing social change and building new civilizing paradigms (Acosta et al., 2014).

This approaches claim for creating more democratic spaces for energy planning open for civil society participation, spaces where civil society has greater control over energy decisions and increase their energy sovereignty (Acosta et al., 2014; Dafermos et al., 2015). Hence,

decentralized renewable energy systems are defended for its diverse, participative and sustainable nature (Fernández-Baldor, Boni, & Hueso, 2012; Shyu, 2014) and for being closer to people and territories (Acosta et al., 2014; Bertinat et al., 2014; Dafermos et al., 2015). These systems have also proven suitable for providing energy to isolated rural communities, and have been widely utilized in rural electrification projects all over the world (Barnes, 2011; Shyu, 2014).

Decentralized renewable alternatives foster bottom-up energy planning processes, unlike centralized energy systems that restrain energy-society deliberation processes to a technical level captured by certain elites or technical experts (Mathai, 2012). In order to advance transitions to more sustainable civilizing paradigms, energy-planning process should take into account non-expert knowledge and innovation skills of the deprived populations, foster environmental sustainability and, at the same time, the redistribution of power (Acosta et al., 2014; Bertinat et al., 2014; Dafermos et al., 2015; Mathai, 2012).

### **GRASSROOTS INNOVATIONS: POTENTIALS AND CHALLENGES**

As actions for sustainable development, some decentralized renewable-energy alternatives used into community projects have been considered as Grassroots Innovations (Seyfang & Smith, 2007). GI are defined as “networks of activists and organisations generating novel bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved” (Seyfang & Smith, 2007, p. 585). These initiatives link sustainable technologies and societal arrangements in response to social and environmental needs and to ideological commitments. Social needs may arise, for example, from a deficient access to goods and services for some deprived people. The ideological commitment on the other hand, emerges from peoples’ aspirations to develop practices based on alternative values; ways of doing things different from the traditional practices applied in the market-based economy (Seyfang & Smith, 2007).

GI take then different organizational forms such as cooperatives, social enterprises or voluntary organizations, and can play an important role inspiring sustainable and innovative public policies (Seyfang & Smith, 2007, 2009). However, they face some challenges. They support on different resources, including donations, voluntary inputs or grand funding. This resource base is usually an economic constraint for developing the initiative independently, and to continue the innovative process despite difficulties. Moreover, as they are small-scale initiatives and face local problems, global actors usually find them irrelevant. They need then encouraging structural factors to keep going (Seyfang & Smith, 2009).

### **THE CAPABILITY APPROACH: KEY CONCEPTS**

The Capability Approach (CA) has been widely utilized for development planning initiatives analysis (among others, Muñiz, 2014). The CA provides the theoretical basis of the Human Development (HD) paradigm, which is based in four key principles equality, sustainability, productivity and empowerment (Ul Haq, 1995). Under this approach, development should lead to an expansion of the capabilities needed to live the life people have reason to value (Sen, 1999). Development is now a process instead of an end. A process based on peoples’ freedom to choose with kind of development they would like for themselves (Alkire, 2008).

Functionings is another key concept in the CA. They refer to “the different things that a person can value doing or being” (Sen, 1999, p. 3). While capabilities refer to the valuable options from which a person can choose, functionings are the elections that finally choose (Robeyns, 2005). A simple example is being well nourished (capability) and eat (functioning). Capabilities can be either individual or collective. Collective capabilities are those only achieved as a result of social interaction and collective action (Ibrahim, 2006). Nevertheless, transforming capabilities (individual or collective) into functionings requires a special context. The CA approach recognizes the diversity of persons and their own circumstances. The fact that an individual or community has access to some goods or services, such as the energy service, does not necessarily lead to the expansion of human capabilities. It depends on the personal and socio-environmental context in which these goods or services are delivered. This context is influenced by the conversion factors, which can be personal (i.e. literacy or language), environmental (i.e. geography or infrastructure) or social (i.e. public policies, or power relationships) (Robeyns, 2005).

Finally, agency is another key element of the CA. An agent is “someone who acts and brings about change, and whose achievements can be judged in terms of her own values and objectives” (Sen, 1999, p. 18). That is, agency is peoples’ ability to act according to their values (Sen, 1992). A person with high levels of agency would be more capable of developing actions according to what she or he values (Alkire, 2008), actions to make “a difference in the world” (Crocker, 2008, p. 344).

In this paper, we use the CA as a conceptual framework to evaluate GI. Some scholars link social innovation with Human Development, connecting social innovation with social justice, participation and commitment with civil society (Moulaert, MacCallum, & Mehmood, 2013). Mathai (2012) relates GI in the energy field with the CA: “Grassroots innovations tend overwhelmingly to internalize energy and material efficiencies and conservation practices while pursuing valuable capabilities and functionings” (p. 108). We assume then that, through the lens of the CA framework, GI initiatives are processes where people’s real options should be expanded. The personal, environmental and social conversion factors are the elements that can either constrain or foster the GI. This paper focuses on identifying these conversion factors.

## **ECUADOR AND THE MORONA SANTIAGO’S ENERGY OBSERVATORY**

Ecuador is a relevant case as far as contemporary social transformation is concerned. These initiatives, articulated around the *Buen Vivir* (Good Living), interrogate the hegemonic vision of development (Acosta, 2012). Nowadays, energy is one of the strategic sectors for Ecuadorian Government as it is said in the Constitution and in the last National Plan for *Buen Vivir*. As the main strategy to achieve *Buen Vivir*, the Ecuadorian Government is promoting the change of the productive matrix, based on the energy matrix transformation. In order to do it, is committed to energy sovereignty, and supports renewable energies as a mean to reach it (Asamblea-Constituyente, 2008; SENPLADES, 2013). However, as it happens with the different *Buen Vivir* conceptions (Hidalgo-Capitán & Cubillo-Guevara, 2014), there is some distance between discourse and practice regarding energy policies (Villavicencio, 2014). This is evidenced by the governmental support to extractive industries and to large-scale hydroelectric generation projects (Acosta, 2014). Large-scale energy projects are widely questioned by the indigenous movement and by the *Buen Vivir* ecological school of thought (Hidalgo-Capitán & Cubillo-Guevara, 2014). They argued that this kind of projects are developed for the sake of

national interests instead of the local ones and are against energy sovereignty due to their centralized nature, the civil society scarce participation (Acosta et al., 2014), and the high debt they create for the country (Villavicencio, 2014).

The Ecuadorian Amazon is scenario of these debates, and despite being the most diverse region in the country in terms of biodiversity and ethnicity, has the lower rate of electrical coverage (93,7%)<sup>1</sup> (ARCONEL, 2015). Rural electrification projects in the Ecuadorian Amazon have usually been developed conceiving energy access as electricity access, developing initiatives that generally do not go beyond energy supply.

In 2012, in Morona Santiago, one of the 6 Amazonian provinces, some indigenous organizations together with the local energy company, various local governments, and civil society actors created the Morona Santiago's Energy Platform. This initiative was shaped to face the growing need for energy planning mechanisms at a territorial level arranged between the local and national actors and, at the same time, to foster the effective application of energy policies in favor of renewable energies. This experience was first supported by a local NGO called the Ecuadorian Foundation of Appropriate Technology (FEDETA, according to its initials in Spanish). Some time later, was supported by the Ecuador's Ministry of Electricity and Renewable Energy (MEER, according to its initials in Spanish) in a project funded by the Inter-American Institute for Cooperation on Agriculture (IICA), when it changed its name to Morona Santiago's Energy Observatory.

In 2015, 12 different organizations and institutions actively participated in the MSEO: the local energy company (managed by the Government), provincial offices of health and education, local governments and indigenous organizations from Shuar and Achuar nationalities (including women indigenous organizations). The MSEO was the first and unique space at a national level specifically created to exchange knowledge and the different points of view from institutional energy actors and civil society in order to drive sustainable energy policies in accordance with the aspirations and values of the indigenous populations. Related to this, a Shuar woman<sup>2</sup> claimed: "I am now knowing the needs and knowledge of other institutions, national and international organizations".

During the 3 years it was working, the MSEO was capable of inspiring new public policies. Among others, stands out the management model for off-grid energy systems, took as a reference by the MEER to build a management system at a national level. Besides, the methodology for identifying and prioritize communities to be energized and the technical designs of two projects based on decentralized renewable energies were taken as examples by the MEER and all the other energy companies around the country in order to establish a design methodology at a national level.

The approach fostered by the MSEO based on the indigenous populations' energy needs and aspirations and sources of expert and non-expert knowledge departed from the conventional way of energy planning focused on satisfying a growing energy demand. This bottom-up way of energy planning not only promoted decentralized renewable-energy systems, but also reflected different values about energy generation and consumption. However, when the IICA

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<sup>1</sup> Last data from the Agency of Electricity Regulation and Control (ARCONEL) from 2014 (ARCONEL, 2015).

<sup>2</sup> MSEO meeting, Macas, 25 November 2013.

fund was finished, the initiative stopped functioning despite the indigenous organizations and the health and education sectors interest to keep going.

## **METHODOLOGY**

We developed our research from 2012 to 2015 as part of the FEDETA team. Our methodology was based on qualitative methods, using participant observation, focus groups and semi-structured and unstructured interviews with indigenous activists and institutional energy stakeholders. We also worked in two indigenous communities placed in Morona Santiago. These communities belong to the Achuar indigenous nationality and did not have any energy service. We co-designed the fieldwork strategy together with FEDETA and we realized the field visits with them and the local energy company staff. The contributions of FEDETA's indigenous staff were key when employing the fieldwork methodology in the communities.

The methodology has an ethnographic inspiration (Mosse, 2005) which helped us to clarify what was happening around the MSEO experience. Qualitative methods were essential in our research, as they allowed us to understand indigenous peoples' aspirations around energy and also the political aspirations of the public energy stakeholders. These methods were also useful for understanding the interactions between indigenous peoples and state actors and the motives toward the development of the MSEO initiative.

## **PERSONAL, SOCIAL AND ENVIRONMENTAL CONVERSION FACTORS AS CONSTRAINTS FOR THE MSEO GI INITIATIVE**

What were the factors that limited the MSEO GI experience? Firstly, social conversion factors were the principal constrains faced by the MSEO. FEDETA was first supporting the initiative, but, as it kept growing, a major support base was needed. The decision was then search for other funds such as the one offered by the IICA. But to participate in this fund, it was necessary to engage with the MEER. The Ministry supported the initiative with one condition: it was necessary to change the name from "Energy Platform" to "Energy Observatory"<sup>3</sup>. This was the first of many requirement imposed by the MEER. Using its position of power among the local energy company, this institution tried to control all the processes, demanding specific timings, budgets and bureaucracy requests. The MEER control need, or "control illusion"<sup>4</sup>, make the process slower until it stopped.

Environmental conversion factors play also a role in this matter. The indigenous organizations had their own participatory processes, which involved the participation of communities with limited communications as a consequence of their complex geography and their dispersed nature. The funding stakeholders and their frameworks did not adapt to these particular characteristics and enhance barriers to the participation of the indigenous organizations in the MSEO decision-making processes. One example of this is that the MSEO meetings were always developed in the city of Macas, Morona Santiago's capital. Despite the continuous requests of some indigenous organizations of doing it in communities deep in the forest, the institutional stakeholders were opposed, as it would represent major costs and travelling time.

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<sup>3</sup> As one worker from the MEER told us, the concept 'platform' is related to indigenous struggles in Ecuador.

<sup>4</sup> IICA's worker interview. Quito, 20 May 2015.

The political disagreements between the government and the indigenous peoples at the national level were another conversion factor that limited the GI. There were changes in some local governments in the 2013 elections. Some of the new local governments close to the indigenous movement were opposed to the current Government. The MEER lost part of its interest in keeping the MSEO working and, consequently, so did the local energy company. Other MSEO participants, especially the health and education actors linked to the Government, lost some of their motivation and each time it was more difficult to have the MSEO meetings. On the other hand, the indigenous organizations, which were the first believers in the process, complained about the governmental stakeholders, arguing that they were focusing on the national problems instead of on the local difficulties. The previous reveals that without a solid institutional support at a territorial and national level it is difficult for a GI to sustain over time and therefore, to continue with the expansion of individual and collective capabilities of the people who participate on it.

Apart from these social and environmental conversion factors, we are also able to identify some personal conversion factors that influenced the GI. In the MSEO there were some individuals that were key to the process. Among the indigenous participants, they were leaders with a large trajectory of struggle but also, with experience in development projects. Those two skills enable them to be the link between the indigenous communities and the institutional actors. That was crucial when defining the parameters need it to design energy alternatives adapted to the indigenous different realities but also, adapted to the development project timing. Referring to the energy-development projects an Achuar leader<sup>5</sup> said: “the vision of the Ecuadorian Achuar Nationality<sup>6</sup> that we want to transmit to the Government is that the projects do not break the structure, the communities cosmology [...] energy is not immediate, it is necessary to have a process”.

Despite the GI reinforced the leaders agency to claim for indigenous energy rights in the MSEO space and in other spaces, these key individuals constitute also a limitation for the GI continuity. For example, when the indigenous leaders were not able to attend the MSEO meetings, the communication with the institutional actors was not as fluent and it was more difficult to come to specific agreements. However, these situations represent an opportunity for other people to participate, specially indigenous women who, thanks to involvement in the MSEO and the enthusiasm put into the initiative, believed in their ability to speak publicly and claim for their rights. When an indigenous woman<sup>7</sup> was referring to what the MSEO meant for her she explained: “I learnt to share ideas, to present, I learnt who the support institutions are [...]. I began to participate in the MSEO and then inform to mothers, women, fathers, especially in the communities”. Nevertheless, as this kind of capability and agency expansion was not specifically stated in the project framework presented to the IICA, the MEER did not find it relevant.

The combination of these social, environmental and personal factors diminished the degree of trust from sponsors to overcome difficulties and respond to the needs and claims arisen from the MSEO. At the end, in the institutional energy actor’s agendas prevailed an approach with planned short-term results. An approach focused on increasing the province electric supply and

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<sup>5</sup> MSEO meeting, Macas, Ecuador, 4 February 2014.

<sup>6</sup> The Ecuadorian Achuar Nationality is the political organization of the Achuar population.

<sup>7</sup> Focus group, Macas, Ecuador, 20 October 2014.

maintaining a centralized energy system rather than responding to indigenous aspirations, which claim to have major control of the energy systems installed in their communities.

## CONCLUSIONS

Grassroots Innovations emerge as alternatives for sustainable development and respond to social needs and ideological commitments. They are bottom-up processes that can inspire new and innovative public policies but usually face lots of challenges (Seyfang & Smith, 2007). In the energy field, different GI are emerging, such as initiatives promoting alternative ways of doing energy planning based on decentralized renewable energy systems. As the philosophical basis for the Human Development paradigm (Fukuda-Parr, 2003), the Capability Approach has been used for development planning initiatives analysis (Muñiz, 2014). In this paper, we used the CA framework to explore the factors that constrain GI in the energy sector.

Specifically, we look at an initiative in the Ecuadorian Amazon, the Morona Santiago's Energy Observatory, a community action initiative that involved institutional energy actors and civil society committed to an alternative way of doing energy planning. It was a powerful innovative initiative to achieve a more sustainable and fair energy scenario in the Amazon, closer to the perceptions of what energy and development mean for the indigenous peoples. The experience enabled to create a space for dialog between the macro and micro levels of energy planning, engaging institutional energy actors with society and territories. However, despite its potential for social transformation and reorientation of existing energy planning methods, did not survived.

Through the lens of the CA, we unveiled the social, environmental and personal conversion factors that constrained this GI. We identified four main limitations. Firstly, regarding social conversion factors, power relationships between the local and national levels of energy planning together with the institutional energy actors' requirements constrained the initiative. Secondly and related to the previous, the political disagreements faced in all the country between the Government and the indigenous organizations caused a lack of motivation among some actors and a lack of confidence among others. Thirdly, as an environmental conversion factor, Morona Santiago's complex geographical conditions made difficult the participation of indigenous activists from some communities. And lastly, as a personal conversion factor, the fact that the MSEO needed some key individuals to be viable, individuals with development projects experience. When these individuals did not participate in the MSEO meetings, was complicated to move forward.

The MSEO was thus a source of learning regarding contextual factors that limit the development of grassroots initiatives. The CA helped us to analyze these factors, conceiving GI as processes where peoples' real options expand. We hope that this analysis helps to promote a collective reflection oriented to challenge traditional logics of energy planning and to encourage new GI involving alternatives modes of energy, territory and society relationships.

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