Review of the social acceptance and social acceptability notions: In case of geothermal energy projects in East-African Countries

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ABSTRACT

In Africa, most of the projects are being implemented according to western models, mostly they are imposed to the local communities who are ignorant of everything on the technologies implanted in their own territories. This situation results of the failure of technology transfer policies in developing countries (Wisner, 1979), it "accounts for imperialist violence and the perpetuation of different forms of neocolonial domination" (Clifford, 1996). As a result, the approach based on the social acceptability of technologies cannot itself explain the failure of the technology transfers and controversies can be emerged. East African countries are committed to develop geothermal energy to meet their socio-economic growth agendas. But the project areas are mainly populated by local communities ignorant of those technologies and their uses. Controversies can be emerged on the territories utilization, water management, environmental protection and cultural heritage. Those controversies showed the limit of the social acceptance or acceptability approach.

1. Introduction

"Energy is a fundamental factor of production in all economies" (John Reiley, 2015), energy is therefore a factor of development. The energy currently produced comes mainly from the Earth's fossil resources such as coal, oil, uranium, and natural gas. The use of these resources has enabled industrialized countries to enjoy a modern economy, industrial development, and comfort that developing countries do not have (John Reily, 2015; Bruno Maresca and Anne Dujin, 2014). The first report of the intergovernmental group on climate change established the link between human activities and global warming and more precisely the greenhouse gases effect caused by carbon dioxide (IPCC, 1990).
The current energy system faces major challenges including climate change, the depletion of fossil resources, as well as the rise in the price of these resources; these have sparked the advent of a new paradigm "energy transition" which is reflected in a new form of cooperation between industrialized countries, emerging countries and least developing countries (LDCs) to reduce the consumption of fossil resources, socially, technically, economically and culturally (Gilles Carbonnier, 2011) to fight climate change. To this end, the Paris Agreement, the first universal agreement on climate change indicate the reduction of global warming to 2 degrees Celsius in 2050. The energy transition represents "the transition from an energy system based on fossil fuels to an energy system that improves energy efficiency and based on the use of renewable energies" (IRENA, 2018). However, this is a part of a context of rising energy demand due to population growth in developing countries and the maintenance of a high living standards in industrialized countries (Nadia Benalouache and Kévin Duruisseau, 2015).

Globally, 1.4 billion inhabitants do not have access to electricity, 70% of which is in Sub-Saharan Africa, wood energy is the main source of energy for rural African communities (IEA, 2014), the use of which accentuates the loss of plant cover, accelerates desertification and accentuates climate change (plants take up the carbon dioxide which is responsible for the greenhouse gases effect). Africa loses 0.5% of its plant cover annually (Gérard Madon, 2012). African countries are accelerating their energy transitions through the development of renewable energies including solar, wind, biomass, hydroelectricity and geothermal energy (see Fig1) in order to fight climate change and reduce the use of wood energy.

![Figure 1: Energy source in Africa for the 2018-2040 scenarios, International Energy Agency, 2019](image)

However, the energy transition reflects profound changes in the current energy system and is not limited to a technological dimension, but include socio-economic, territorial, political and regulatory dimensions (Nadia Benalouache and Kévin Duruisseau, 2015). Indeed, the deployment of renewable energies can meet non-technological barriers including economic, logistical, environmental and social barriers. (See Table 1)
Social acceptability is one of the social barriers to the deployment of renewable energies, it generally represents the resistance of local communities on a particular project (Laurence Serra, 2011) but it represents also the inertia factors produced by “series of resistances” (Marie Christine Zelem, 2015). Controversies related to social acceptability have multiplied in recent years, they are translated as extra-financial risks or indirect costs by companies (Ernst and Young, 2012; Ruggie, 2010), which contradicts the concerns of local communities which go beyond the simple creation of jobs and tend towards the transfer of technology through training, the distribution of wealth, empowering local communities and controlling the environmental impact of the project (Delannon et al, 2011). This new approach invites us to take into consideration the social aspect of technological projects and to think in terms of socio-technical feasibility which refers to a shared responsibility in the technical and political world and the social world (Marie Christine Zelem, 2015). To this end, according to the United Nations, strengthening local capacities in the adaptation, use and mastery of technology promotes socio-economic development and technology transfer (UNCTAD, 2014).

In Africa, renewable energy projects are mainly undertaken in rural areas in order to allow rural communities to benefit from decentralized local energy and to reduce the use of wood energy. Geothermal energy projects are currently being developed in East Africa, notably in Ethiopia, Djibouti and Kenya, these projects are undertaken by governments, private companies, and financial donors or investors. Some of these projects are controversial, such as Olkaria project in Kenya, other projects can be controversial in Ethiopia and in Djibouti, because the local communities (Massai, Oromo, and Afars) are asking for better engagement in these projects and a responsible share of the financial benefits of the projects.

2. Social acceptability and territories

The territory as defined by Pierre Larousse (1875) is "a space thought, dominated, and designated. It is a cultural product, just like a category of perception that man chooses within sets that are still undifferentiated ", but it is also defined by Maryvonne Le Berre (1995)" as the portion of the earth's surface, appropriated by a social group to ensure its reproduction and the satisfaction of its vital needs. It is a spatial entity, the group's place of life, inseparable from the latter”. It is important to note here that the territory is a social space, a space dominated by a social group to satisfy their vital needs; in fact the social is manifested in the interaction between individuals "located" and "localized" (Thierry Paquot, 2011).
Socio-economic development projects are part of territories with distinct social, geographic, economic and environmental characteristics. The implementation of these projects can create problems of “good neighbors” (Joannie Roy, 2018). Disputes around the implementation of a project in a given territory are defined by the concept of social acceptability.

Social acceptability does not have a universal definition, but according to Caron-Malenfant (2009) social acceptability is "the result of a process by which the parties concerned build together the minimum conditions to be set up for a project, a program or a policy integrated harmoniously, and at a given moment, in its natural and human environment "and according to Fournis and Fortin (2013) “social acceptability is defined as a process of political evaluation of a project involving a plurality of actors involved at various scales and from which gradually build recognized institutional arrangements and rules legitimate, because they are consistent with the vision of the territory and the development model favored by the actors concerned ”. Social acceptability therefore refers to a perception of the stakeholders on a project and it is also the result of negotiation between the stakeholders to overcome a situation of conflicts and controversies around a project (Sofiane Baba and Chantale Mailhot, 2016).

According to Boltanski and Thévenot (1991) in the theory of “economies of greatness”, the agreement and the controversies can be carried out between seven worlds such as the civic world, the world of the opinion (initially called of the reputation world), the commercial world, the industrial world, the domestic world, the inspired world and the green world; these worlds have distinct principles and values. According to Boltanski and Thévenot (1991), there can be only three types of controversy between worlds including (1) controversy in the same world, (2) controversy occurs during the juxtaposition of different worlds (without conflict situation), and (3) controversy between different worlds (with conflict situation); there are also three types of solutions according to them which are the clarification, the arrangement and the compromise. The resolution of conflicts linked to controversies refers to the participation of the stakeholders involved, indeed, development projects can fail “for lack of being able to engage targeted populations and / or actors from the territories concerned early enough” (Marie Christine Zelem, 2015). This opens the way to the notion of participative or deliberative democracy which is a "movement which aims, more or less clearly and effectively, to institutionalize the participation of ordinary citizens in other forms than the simple appointment of elected representatives" (Elodie Ferenzin, 2015).

Decisions from participatory democracy are more legitimate than those from representative democracy and reflect a “social fabric” and local actors from a territory; this new governance is driving a new bottom-up dynamic in which information flows from the bottom up (Gendron, 2014). The participation of local communities is therefore imperative in the decision-making process for the implementation of territorial projects.

3. Social acceptability and renewable energies

Renewable energy projects in regions are confronted to social acceptability. The most controversial projects concern hydroelectric projects in Canada and wind power plants in Europe. In France and Germany, a study carried out by Arthur Jobert, Pia Laborgne, and Solveig Mimler (2007) has shown that the social acceptability of wind projects can depend on the implementation of the project, the local integration of developers of projects, the creation of support networks, and access to ownership of power plants by local communities. These aspects are in addition to those appearing in the literature, namely visual impact, ownership, information and participation (Arthur Jobert et al, 2007). In Canada, a conflict that lasted two
decades over a controversy surrounding the hydroelectric dam project between Hydro-Québec and the Cree Nation (local population) has made it possible to develop an approach that promotes respect for the socio-political organization of local communities (Cree Nation) and the capacity building for the co-construction of projects (Sofiane Baba et al 2016). For Anglo-Saxon literature, the notion of social acceptability of renewable energy projects is made up of three dimensions, including (1) the dimension of socio-political acceptability which refers to the acceptability of technologies by politicians, political decision-makers and stakeholders, (2) market acceptability which refers to the adoption of a technological innovation by the market, and the acceptability of the technology by consumers,

Figure 2: Triangle of social acceptance, Wustenhagen et al, 2007

3. Social acceptability and geothermal energy

According to J.P Oliver de Sardan (1995) "Development "is only one form of social change and cannot be seen in isolation. The analysis of development actions and popular reactions to these actions cannot be separated from the study of local dynamics, endogenous processes, or “informal processes of change”". To access development, African countries are ardently committed to the development of renewable energies to reduce their greenhouse gases emissions and mitigate the effects of climate change. The East African Countries have recently committed to develop geothermal energy, the potential of which is estimated at more than 20,000 MW (at the level of the East African rift), Kenya is the only country which exploits this resource efficiently with an annual production of 636 MW which places it in fifth place among the largest producers of geothermal energy in the World (IRENA, 2018). However, Ethiopia with its 5 MW of production is not to be outdone and is developing several projects in Aluto Langano, Corbetti and Tendaho. The Republic of Djibouti is following with the development of projects in Lake Assal and in Hamlé-Garabayis. These projects are implemented in territories with specific socio-environmental characteristics indeed these territories have protected areas (Lake Assal, Suswa, and Aluto Languano) and are traditionally occupied by agro-pastoral communities (Afars, Oromos and Massais). Ethiopia with its 5 MW of geothermal energy production is not to be outdone and is actually developing several projects in Aluto Langano, Corbetti and Tendaho.
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Studies carried out in Kenya by Wanjohi F. Kinga and Josphat Kwasira in 2016 has shown that geothermal exploration generating environmental and social impacts. These impacts were due to, (1) to the odor caused by the emissions of gases (80% of CO2 and 9.5% of H2S) during the tests, (2) to the felling of the vegetation and the loss of habitat for wildlife during the installation of drilling infrastructure (drilling platforms, water supply, and access roads), (3) noise generated during civil engineering activities and tests, and (4) the reluctance of local communities who refuse to implement the project either because of a poor understanding of the project, or because of a bad experience with previous projects, or because of fear.

Indeed, currently reluctance of local communities towards geothermal energy is observed in Japan where a controversy has emerged on the geothermal steam which is used by the industrial companies to generate electricity and by the owners of hot baths "ONSEN" (Kabuto, 2015). Other controversial projects have emerged in other territories including Milos and Nisyros (in Greece), Mt. Amiata in (Italy), Ohaaki (in New Zealand), and in Puna (Hawaii in the United States). According to Cataldi (1999), the impacts on the ecosystem, human health, the local economy, the alteration of the landscape, and the loss of the cultural heritage can justify the attitude of the local communities towards geothermal projects.

Currently, International development banks funded an involuntary resettlement programs in Olkaria in Kenya and Aluto-Langano in Ethiopia to develop geothermal power plants. The local communities as Massai (Kenya) have joined together to assert their right over the geothermal resource and denounce the loss of their cultural heritage (Kenya).

4. Limits of the social acceptability and the new paradigm

Social acceptability apart from its conceptual and definitional notions (Sofiane Baba and Chantale Mailhot, 2016) has limits. Indeed, this concept refers the responsibility for the failure of development projects to local communities (Marie Christine Zelem, 2015) who are stigmatized by acronyms like NIMBY (not in my back yard), LULU (locally unwanted land use), NIABY (not in anybody's backyard), NIMTOO (not in my term of office), BANANA (build absolutely nothing anywhere near anyone) or CAVE (citizens against virtually everything) (Joannie Roy, 2018). Project promoters highlight the selfishness of local communities, considering that their concerns do not respect the general interest (Wolsink, 2006; Batelier, 2015). However, the concerns of local communities are generally collective, such as "the fall in property values, the inability to keep unwanted uses of the territory out of the community, a decline in the quality of life caused by noise, traffic, odors and others, the deterioration of the image of the community, the increase in community services as well as the unsightly aspect of the project (Sandman, 1985).

However, the only opposition between the general interest and the particular interest cannot explain the conflicts around territorial projects (Arthur Jobert, 1998). Project promoters can also rush through consultative and participatory processes by closing discussions on projects before engineering studies (Elodie Férezin, 2016) and by stigmatizing the opponents during the discussions (Joannie Roy, 2018). Given the flaws in the concept of social acceptability which has long served project promoters in resolving conflicts and assessing financial risks, it is necessary to adopt a socio-centered posture of renewable energy projects to understand the modes of diffusion, integration and implementation of these technologies in the territories, this new conceptual approach is socio-technical feasibility (Marie Christine Zelem, 2015).
5. Conclusion

The local communities living around the geothermal project areas in East Africa are mainly pastoralist, agro-pastoralist or nomadic population (Djibouti, Ethiopia and Kenya), those communities can benefit from the development of geothermal energy, but their real interest must be known in order to avoid any conflicts and controversies. Most of the geothermal projects in East-Africa are done as a western project “up-down projects” including the realization of environmental impact assessments, stakeholder engagement and reinstallation action plans, but those techniques must be revised to be applied in our cultural context. Because those techniques are techno-centered and socio-centered techniques must be used to sustain the geothermal energy development projects in our region. The socio-technical feasibility is a socio-centered tool that can be used for geothermal energy.

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