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Land for food or power? Risk governance of dams and family farms in Southwest Ethiopia

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ABSTRACT

We use the concepts of riskscapes and risk governance to analyze the tensions between land use for food (farms) and energy (dams) in South West Ethiopia. We analyze the linkages between risk perception, risk assessment and risk management for local and non-local actors. We distinguish, after empirical analysis, as main riskscapes the riskscapes of landlessness, food and energy insecurity and siltation. For the Ethiopian case, and more generally, we reflect on the potential of spatial planning as a site of risk governance, where risk perception, assessment and management can be discussed in their linkages, where different actor-related and topical riskscapes can encounter, can be deliberated and result in policy integration. We finally reflect on the ethical implications of our perspective and reconsider the idea of social cost.

1. Introduction

Hydropower provides electricity to one fifth of the world's population (World Bank, 2009) and one third of the world countries rely on this source of electric power (World Commission on Dams (WCD), 2000). According to WCD (2000), 24 countries in the world depend on hydropower dams for supply of over 90 percent of their electricity supply. Expansion of hydropower dams has been the result of rapid population growth and the associated increase in demand for energy (Siciliano and Urban, 2017). With the projections of world population indicating increasing trends in the future, dam construction is considered necessary to meet the growing demand for energy (Chen et al., 2016). Moreover, hydropower dams are the major renewable sources of clean electrical energy. Taking this into consideration, it is essential to think about how to better construct, operate and maintain hydropower dams and their reservoirs to reduce their negative impacts on the environment and society (Chen et al., 2016). This is because the end result of any hydropower dam development project must be sustainable improvement of human welfare (WCD, 2000).

However, there are risks inherent to the development and operation of hydropower dams on the environment and society (Fearnside, 2014; Alhassan, 2009; World Bank, 2009; Bezuayehu, 2006; World Commission on Dams, 2000). The production of hydroelectric power demands huge investments in the construction of dams and the creation of artificial lakes with massive impacts on land use and land cover. Large hydropower dams often cause risks of landlessness/physical displacement; loss of natural resources such as forest, mines and grazing land; loss of cultural heritage, identity, access to food and the general welfare on the local community, mostly the family farmers (Bahiru, 2010; Tefera and Sterk, 2008; Bezuayehu, 2006; Fearnside, 2014; World Commission on Dams, 2000). This means the local communities hosting hydropower dams often become "physically unsettled and imaginatively displaced, evacuated from place and time and thus become uncoupled from the idea of a national future and national memory (Nixon, 2010)" while the dam projects can have important economic and social contributions at national or regional levels. For instance, it is estimated that construction of large dams displaced 40 to 80 million people worldwide (WCD, 2000).

According to Nixon (2010) "displacements due to dams have resulted in declining key barometers of quality of life: nutrition, health, infant mortality, life expectancy and environmental viability." The major challenge with the dam projects lies with the neglect of the affected people since governments usually do not compensate and properly rehabilitate dam-affected people. According to the 1994 World Bank study cited in WCD (2000), only one out of the 192 dam resettlement projects had involved compensation and rehabilitation of the dam affected people. As a result, dam construction is a disputed issue worldwide, of high importance for governments, local people and the

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environment (Swyngedouw, 2007; Nixon, 2010). We can further mention the dependence of modernist-inspired governments on large scale projects to legitimize themselves and their ideologies of progress (Swyngedouw, 2007; Scott, 1998) and more generally, the tendency of large water projects such as dams and irrigation systems to keep power/ knowledge configurations in place, thus reducing critical scrutiny of regimes and democratic innovation (Bijker, 2007; Molle et al., 2009). In addition, the dams as physical objects are hard to remove and represent long-term investments that are hard to erase, while the water systems in large areas are likely affected. Thus, socio- ecological systems and the livelihoods and land uses they permit are made path dependent by the physical intervention (Rap and Wester, 2017; Van Assche et al., 2017a).

Ethiopia offers a window on many of the dam- issues identified above. It had a succession of modernist regimes with high ambitions and limited resources, and large dams featured prominently in the socialist- inspired development plans. In the last two decades, Ethiopia has experienced a massive economic boom coupled with agricultural transition and socio-cultural changes (Stellmacher, 2015). In this context, the country has increased its hydropower generation capacities massively to satisfy domestic consumption demands, boost industrialization, and become a top regional electricity exporter (World Bank, 2007b). Most large hydropower dams in Ethiopia have been built in the southwestern part of the country, an area characterized by heavy precipitation, in the rainy season, a rugged terrain, fertile soils, and traditional family farming. The dams, as sources of energy, planned for improving the domestic hydropower generation and export, are expected to have social, economic and ecological consequences. Therefore, there is an increasing need to understand the risks created because of tensions between the competing uses of land and the characteristics of these risks that increase vulnerability of family farming households to food insecurity, and long-term viability of the hydropower dam in order to design relevant strategies to address them. This study is an attempt to contribute to that end. We focus on the Gilgel Gibe-I (GG-I) hydroelectricity dam located in the Jimma Zone, Oromia region, southwestern Ethiopia, which is one of the largest dam projects carried out in the county in the past decades (Fig. 1).

The first plans for the construction of a hydroelectricity dam on the Gilgel Gibe river were conceived in the 1960s during the imperial regime, driven by an initial study conducted by the Yugoslav Electroproject company in 1963. Preliminary construction activities at the proposed site started in 1988, followed by a cooperation agreement between the Government of Ethiopia and the Democratic Republic of Korea. The project halted in 1994 but reignited in 1996 following an agreement between the Ethiopian government and the Italian company ENEL (EELPA, 1997; Kassa, 2001). Finally, in 2004, the Gilgel Gibe-I project was commissioned at a total cost of 356 Million USD (World Bank, 2006) (Fig. 2).

The dam is a 40 m high curved rock filled barrage whose reservoir has a capacity to store 917 million cubic meters of water (World Bank, 1997, 1999, 2007a). The reservoir of the dam occupies about 48 sq. km. The buffer zone, an area found within 500–1000 m from the upper most limit of the water level in the reservoir in all directions, occupies about 26 sq. km (World Bank, 1997, 1999). The project injected 184 MW dependable capacity and a total production of 722 GWH/ year in 2005 to the Ethiopian grid system (World Bank, 2007a). With this supply, the project increased the power supply in Ethiopia by 45 percent, making it Ethiopia's largest power plant. It enabled to reach additional 380 towns and 164 districts (*woredas*), contributed energy to the country’s fast growing industry and service sector, and even allowed energy export to neighboring countries (Devi et al., 2008).

According to the World Bank’s project completion report on the Ethiopian GG-I hydropower dam project, the project displaced “only” 706 households, all of which were compensated by the Ethiopian government (World Bank, 2007a). The following sections show the reality is slightly more complicated, and that in the current situation, the effects of the dam on family farming still prevail. The family farmers affected depend mostly on corn and *tef* (*Eragrostis tef*), followed by sorghum, pepper, khat (*Catha edulis*) and coffee. The commonly produced livestock in the study areas include cattle, sheep, goats, donkey, horses and mules as well as poultry and honey bee.

In this paper, we analyze the risks the dam poses to family farming near to the dam and its reservoir, with the aim of finding a more balanced relation between land use for hydropower and food production. In order to do so, we develop a theoretical framework to grasp the perception, assessment and management of risk by different actors and for different topics, a framework revolving around the concepts of riskscapes and risk governance. After analyzing our empirical data, we reflect on the potential of spatial planning as a site of risk governance. Finally, we revisit the concept of social cost, which appears in a different light after the construction of our perspective on risk governance for dams and family farms.

2. Methodology

Data were collected from Kersa and Omonada districts (*woredas*), Jimma zone, Southwest Ethiopia (Fig. 1). These areas are considered for our study since they fall within the region of focus for the food security research in Africa known as BiomassWeb project; our study is part of this project. We collected qualitative and quantitative data during one year of fieldwork (May 2015 to April 2016) through household surveys, focus group discussions, in-depth individual and expert interviews, informal individual and group discussions as well as participatory observation. We conducted informal individual and group discussions at the initial stage of the study to get broader understanding of the area and problems associated with the GG-I dam. After we get to know the area very well and understand the research problem better, we continued to organize in-depth interviews with individual farmers and experts, and carry out pre-arranged formal focus group discussions with different target groups.

In order to obtain the views of individual farmers without the influence of peers, we made in-depth individual interviews in isolated locations where the farmers feel free and their views stay confidential. We organized formal focus group discussions with separate groups of male and female farmers composed of the model, medium and poor farmers of all age groups (youth, adult and elderly) depending on their level of participation in the extension program. Expert interviews were conducted with university professors and researchers working on the conservation of GG-I watershed, extension agents and experts working in different government offices. We also had intensive discussions with relevant officials in the district and zonal offices and triangulated some of the information and data obtained from the community through a combination of qualitative and quantitative data collection methods; and review of secondary sources such as GG-I project reports, World Bank publications. We made repeated visits to the project office at Deneba to make field observations and discuss with the project management team. We had several opportunities to observe the community practices especially in soil and water conservation works.

In total, we did in-depth individual discussions with more than 50 farmers, 70 experts in different offices and capacities and 12 informal group discussions involving more than 60 farmers. We also had 22 formal focus group discussions involving 150 farmers; and household survey with 228 sample farmers. There were over five times of repeated meetings with some of the community members and this has enabled us to get the trust of some among the local people that were suspicious at the initial stage of our meetings. We also collected secondary data and relevant documents from different offices.

3. Conceptual framework

We develop a concise conceptual framework drawing on the riskscapes framework developed by Detlef Müller-Mahn and Jonathan Everts (2013) and evolutionary governance theory (Van Assche et al.,