

# Political Ecology in the Anthropocene

## *A Case Study of Irrigation Management in the Blue Nile Basin*

Sina Marx

The study of human-environment relations and the focus on resource management practices have a long tradition in anthropological research. Early accounts that explain societies by means of their natural surroundings were based on a conceptual dichotomy between nature and society. Focusing on differences between societies (a) and the environment (b) was framed as the explanatory variable. The explanation of their connection was mostly one of a simple cause-effect relationship (a**∧**b), a framework that dominated the field far into the nineteenth century (Dove and Carpenter 2008, 1).

In the twentieth century, environmental determinism started to be increasingly contested within anthropology, and a more complex understanding of the relationship between societies and the environment developed. The focus shifted “to the asking of the reverse question, not how does the environment affect society but how, over time, does human activity affect, and especially degrade, the environment” (Dove and Carpenter 2008, 2). Further, with increasing globalization, the focus on local-level analyses alone became insufficient, and it was acknowledged that cultural as well as ecological processes on the local level were part of a broader set of both political and economic factors (Peet and Watts 1993, 1996; Bryant and Bailey 1997).

The paradigm shift to “the reverse question,” how humans affect the environment, has largely been a story of degradation. The narrative of the 1960s proposed that population growth coupled with mismanagement of natural resources by local communities was the primary cause of environmental degradation in the so-called Third World (Neumann 2005, 26 f.).<sup>1</sup> Closely linked with such neo-Malthusian thinking was the notion that the needs of a growing population could

be accommodated through technical and managerial improvements. As a consequence, classical development approaches aimed at implementing an agenda of such adjustments in Third World countries to overcome their environmental problems with the help of (Western) specialists in civil engineering or agronomy. Countering technocentric assumptions about the dynamics of resource use and environmental degradation and criticizing the neglect of social, economic, and political structures gave direction to early political ecologists' writings. Focusing on the social, economic, and political circumstances under which environmental conditions evolved worked to denaturalize nature, showing those conditions to be the outcomes of negotiated power relations (Blaikie and Brookfield 1987).

### DEGRADATION GOING GLOBAL—THE ANTHROPOCENE

Today's narrative on anthropogenic changes to the earth system, the Anthropocene, has taken the discourse of degradation to a new, global level, which provides a rich field for studies in political ecology. The term "Anthropocene" represents the notion that through human actions, we have entered "a new phase in the history of both humankind and of the earth, when natural forces and human forces [have become] intertwined, so that the fate of one determines the fate of the other" (Zalasiewicz et al. 2010, 2231). This statement illustrates the conceptual scientific challenge of the Anthropocene: it breaks down what Chakrabarty (2012, 10) calls the "wall of separation between natural and human histories that was erected in early modernity."

However, framing humankind as a global force and calling the changes resulting from collective human actions "anthropogenic" implies a false homogeneity. It conceals the fact that neither the drivers nor the effects of global changes are equally distributed among humankind. That is why Malm and Hornborg (2014) call global environmental changes "sociogenic," rather than anthropogenic, as a way "to indicate that the driving forces derive from a specific social structure, rather than a species-wide trait" (6). When considering climate change as one effect of an economy that is based on fossil fuels, "humankind" and "anthropogenic" are not categories that can account for the fact that those who are least responsible for climate change in terms of carbon emissions are likely to suffer most from its impacts (fig. 3.1).

Humankind is obviously not a single global agent, particularly when one takes into consideration the inequalities between regions as well as those that exist within a country. Hence, "species-thinking on climate change is conducive to mystification and political paralysis. It cannot serve as a basis for challenging the vested interests of business-as-usual" (Malm and Hornborg 2014, 6).

Against this background, I explore how global institutions and discourses that evolved around the issue of anthropogenic global environmental changes modify

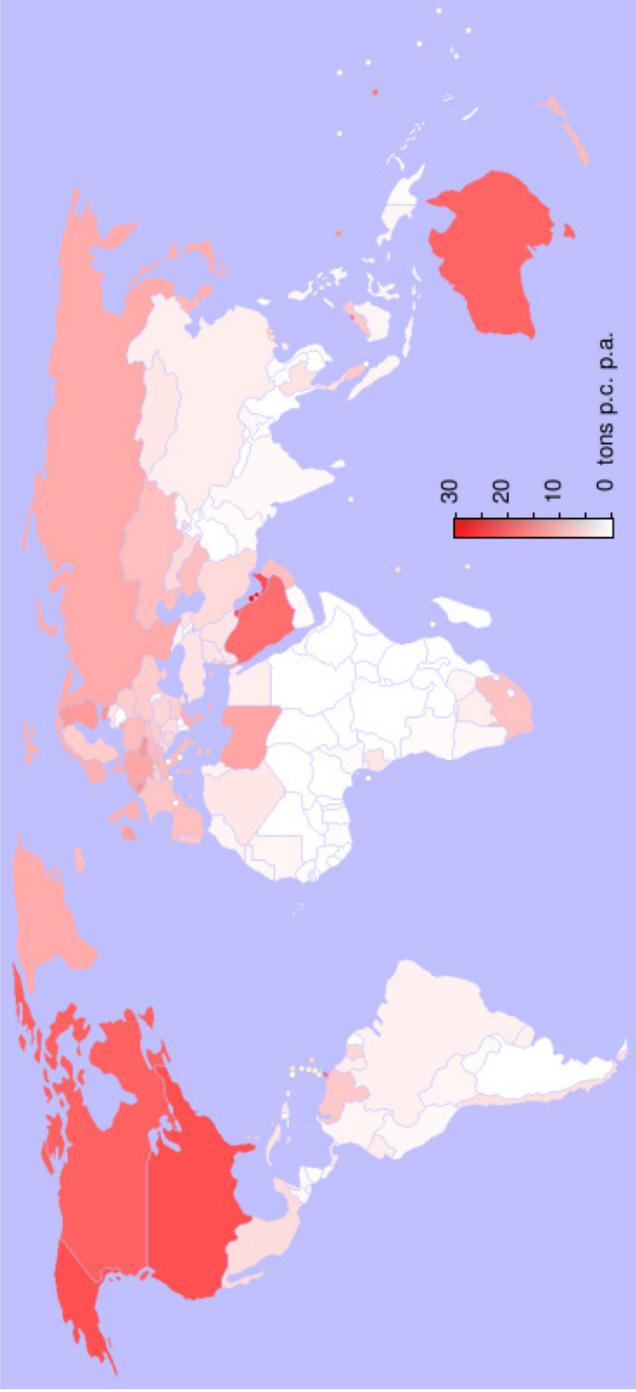


FIGURE 3.1. Annual carbon dioxide emissions [tonnes] per capita from 1990 through 2009. From [http://en.wikipedia.org/wiki/File:CO2\\_per\\_capita\\_per\\_country.png](http://en.wikipedia.org/wiki/File:CO2_per_capita_per_country.png). Licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.

the agency of stakeholders at different levels in water management, using the example of the Koga project—the first large-scale irrigation scheme to become operational in the Ethiopian Blue Nile basin since the 1970s. The study looks at interstate relationships among riparians of the Nile basin under climate change—as the most prominent component of the Anthropocene—and the role of the Koga project in this context. The responses of ministerial actors to changing paradigms of resource management are described at the national level. Finally, the study explores the effects of such changing paradigms and actor constellations on local irrigation management.

## METHODS

Fieldwork was conducted to examine the social impact of the irrigation scheme in two ways. It was done by looking, on the one hand, at institutional and organizational transformations and, on the other, at changes in the livelihoods of farming households affected by the project.

The qualitative methods applied during the research consisted mainly of structured and semistructured interviews, informal interviews, focus group discussions (FGDs), participant observation, and various rapid rural appraisal methods such as ranking exercises and transect walks. The interviews with farmers consisted first of a structured portion in the form of a household survey on the social and economic situation, including information about household members; cultivated crops; other means of income; distance to the nearest freshwater source; access to electricity, sanitation, health, and agricultural services; the farmers' organizations in place, and so on. The second part varied according to the answers given in the first part of the interview and aimed at the perceptions of irrigation benefits and costs, technical problems, and social conflicts related to irrigation. Informal interviews and FGDs were conducted with staff from the engineering company responsible for the supervision and overall management of construction, as well as with those from the capacity building team that conducted trainings with farmers. A couple of these trainings were attended to conduct participant observation, summing up to a total of six full days of lectures and discussions and one day of training on the fields. Those farmers who received irrigation water for their fields had to become members of a water user association (WUA). I attended several meetings of the WUA's different bodies (five zonal meetings and one board meeting). Informal interviews were also held with staff from the government agencies involved, namely, the Ministry of Water Resources (MoWR) in Addis Ababa and Bahir Dar, the Bureau for Agriculture and Rural Development (BoARD) in Addis Ababa and Bahir Dar, and the local Cooperative Promotion Bureau (CPB) in Merawi, as well as with staff and customers of the Agricultural Service and Credit Service Cooperatives in Merawi.

In addition to the fieldwork, an extensive amount of the available project documents were reviewed and analyzed, including the Feasibility Study and its

appendixes (AIL 1995a, 1995b), the Appraisal Report from the African Development Bank (2010), monthly and quarterly reports issued by the engineering companies from June 2003 on, and reports relating to Koga prepared by several consultant firms on behalf of the MoWR.

#### HISTORICAL CONTEXT OF IRRIGATION IN THE TRANSBOUNDARY NILE BASIN

Historically, irrigation has always been closely related to the formation of states and the exercise of power over its citizens (Wittfogel 1957). While large irrigation systems do not inevitably demand centralized authoritative management (Ostrom 1992, 1993; Shivakoti and Ostrom 2002), “regardless of the direction in which causality runs, harnessing water on a large scale has been associated with the formation of many early powerful states” (Barker and Molle 2004, 8). Irrigation has had a long history in Ethiopia, around two thousand years, albeit predominantly practiced on a small scale. With the coming to power of the Derg regime in 1974, irrigation—and in fact agriculture as a whole—declined quickly due to the ensuing socialist land reforms. Today only around 5 percent of Ethiopia’s water resources are being utilized, so state intervention for irrigation on a large scale is rather at a beginning stage, with dam construction on the rise. Considering the social and environmental problems that large-scale projects in the water sector have caused in the past, “the new rush into large-scale irrigation is inviting a number of problems” (Moges et al. 2010, 83) that have already been recognized in the debates on dams of the 1990s and those on irrigation failure in Africa as a whole.

#### WATER STORAGE AND THE STRUGGLE OVER THE NILE

The seemingly paradoxical situation of about 110 billion m<sup>3</sup> of water flowing across the country’s borders every year while a majority of the population lives in a state of constant undersupply of water is a result of both the high variability in rainfall and the lack of infrastructure. Because smallholders account for nearly 90 percent of the overall agricultural production in Ethiopia, and at the same time represent the group most vulnerable to uncertain climatic conditions, national food security is accordingly low.

However, while both the stakes and the potential for water storage are high, so too is the potential for disputes. Approximately 90 percent of the country’s fresh-water crosses international borders. Transboundary management of the resource is indispensable—with the Blue Nile (called the Abbay River in Ethiopia) being the most controversial. While the basin has an estimated irrigation potential of about 711,000 hectares (ha) (Arsano and Tamrat 2005), it is also the largest tributary to the Nile and is therefore subject to conflictive political and economic interests of the other riparian nations, especially those of Egypt and Sudan.

TABLE 3.1. Irrigation and Economic Indicators of Ethiopia and Egypt

Indicators	Ethiopia	Egypt
Irrigated land as % of total cultivated area <sup>2</sup>	2.5	100
Irrigated land in ha <sup>2</sup>	289,530	3,422,178
of which located in the Nile Basin <sup>3</sup>	76,000	3,080,000
Water withdrawal rate (m <sup>3</sup> /capita/year) <sup>1</sup>	48	1202
Employment in agricultural sector (%) in 2005 <sup>2</sup>	81	31
GNI per capita in 2009 (US\$) <sup>4</sup>	380	2,980

SOURCES: Compiled from <sup>1</sup>Gebeyehu 2004; <sup>2</sup>FAO 2005; <sup>3</sup>Kloos and Legesse 2010; <sup>4</sup>World Bank 2014.

Thomas Homer-Dixon (1994) has argued that in transboundary water management “conflict is most probable when a downstream riparian—a river-bordering state—is highly dependent on river water and is strong in comparison to upstream riparians.” This is exactly the case in the Nile basin given the vast differences between the countries in use of water resources and economic indicators (table 3.1).

The area along the Nile in Egypt and Sudan is one of the largest contiguous regions of high irrigation density in the world, and Egypt—as the downstream riparian—is by far the most economically powerful. With around 63.8 cubic kilometers, the total water withdrawal in Egypt equals 3,794 percent of the internally available renewable water resources (FAO 2005, 63), and the vast majority of this water is taken from the Nile. Such inequalities have a long history and are entwined with the history of control over the Nile waters.

From the beginning of agriculture in the region of Egypt and Sudan, around five millennia ago, the Nile has been the basis of life for most of the area’s inhabitants. About two thousand years later, artificial irrigation started, but it was not until the colonial interference of the British that Egypt began to systematically build dams and barrages. In 1929, Sudan and Egypt signed the first treaty exclusively dealing with the allocation of Nile water, allotting 48 billion cubic meters to Egypt and 4 billion to Sudan (Swain 2002, 296). After a phase of heightened political tensions due to the unequal distribution, the negotiations resumed, and in 1959 a new agreement was reached that assigned the entire average annual flow of the Nile to be shared between Egypt and Sudan—neglecting the rights of the remaining eight riparians. Ethiopia was allocated none of the Nile’s resources, although it contributes 80 percent of the total annual flow.

Egypt has long since been unwilling to change the state of affairs by any form of cooperative management. While following its unilateral goals and projects on the Nile, Egypt has historically tried to prevent any upstream development to preserve its own control. However, since the beginning of the 1990s, Ethiopia has started to become a threat to Egypt’s water supply as the country has begun its own irrigation projects on the Blue Nile. Despite protests by Egypt and Sudan, Ethiopia has insisted on its sovereign right to make use of the resources within its borders. The

quarrel reached its peak when Egypt managed to prevent the African Development Bank (the very bank that financed the Koga dam project under study here) from financing Ethiopia's planned water projects (Swain 2002, 298). After decades of political tensions over the use of the Nile water, the establishment of the Nile Basin Initiative in 1999 represents the most promising attempt at basinwide cooperation to date. Even though "there is not yet a new water management regime in the basin, . . . Ethiopia continues to develop its bargaining power vis-à-vis its downstream neighbours and within the Nile Basin Initiative" (Cascão 2008, 27).

#### THE KOGA IRRIGATION SCHEME IN THE CONTEXT OF HYDROPOLITICS AND CLIMATE CHANGE

Against this background, the Koga project is an important experiment within the national Integrated Water Resources Management (IWRM) portfolio. Thus, it has gained wide attention not only in Ethiopia but on the international level as well, even making it into the *Wall Street Journal* in 2003: "The Koga River project is being cast as a 'confidence builder' to show that upstream uses don't necessarily hurt downstream populations. Ethiopian engineers calculate the Koga irrigation would use less than one-tenth of 1% of the Nile flow reaching the Ethiopia-Sudan border" (cited in Haileselassie et al. 2009, 132). Also keeping the challenges of transboundary water management in mind, its success will be crucial for further development of the sector as "achieving implementation targets will be viewed by the international community as an indication of Ethiopia's capacity to handle similar capital-intensive schemes in the future. . . . [It is] regarded by lending organizations as the nation's litmus test to successfully bargain and attract major loans for future investment in the Nile Basin" (Gebre, Getachew, and McCartney 2007, 25). The political relevance of the project on an interstate level is clear: it will affect Ethiopia's bargaining position within the hydropolitics of the Nile, while the legitimacy of infrastructure development increases with the spread of climate change policies.

For the research area in the highlands of Amhara Regional State, climate change scenarios suggest a probability of increased rainfall that could benefit crop yields and thus food security (see, e.g., Bates et al. 2008; Kim 2008). Increased drought is not one of the probable effects of climate change in the Blue Nile basin. Irrigation is still incorporated in the Ethiopian National Adaptation Programme of Action (NAPA) as one of the most important adjustments in the agricultural sector to ensure food security (MoWR, NMA 2007; Ludi 2009, 6).<sup>2</sup> The main reason for this, according to the document itself, is that "current climate variability is already imposing a significant challenge to Ethiopia by affecting food security, water and energy supply, poverty reduction and sustainable development efforts, as well as by causing natural resource degradation and natural disasters. For example the impacts of past droughts such as those of 1972/73, 1984 and 2002/03 are still fresh

in the memories of many Ethiopians” (MoWR, NMA 2007). The AfDB Appraisal Report on the Koga project states the same rationale behind the Koga project: “The GOE [Government of Ethiopia] decision to accord the project a priority stems from frequent drought and food shortages” (AfDB 2001).

The problem of food insecurity can now be tackled with financial support from the international community that might not have been available without the climate change discourse. These developments allow Ethiopia to place water storage, as a national adaptation strategy, on the agenda despite the resistance from its downstream neighbors, a policy that otherwise might have been too politically sensitive to address with regards to interstate hydropolitics. However, as Lautze and Maxwell (2007, 239) point out, vulnerability to drought in Ethiopia “is known to arise from political marginalization rather than either technical deficiencies or the vagaries of the weather.” The following two sections analyze in depth how far the Koga irrigation scheme, as a supposed technical solution, has succeeded in reducing this vulnerability.

#### MINISTERIAL POWER RELATIONS AND THE “NEED” FOR WATER USER ASSOCIATIONS IN IWRM

The ministries involved in policy making regarding water storage for food security are mainly the Ministry of Water Resources (MoWR) and the Ministry of Agriculture and Rural Development (MoARD), since irrigated agriculture is located at the interface of their responsibilities. The Ethiopian National Water Resources Strategy states that it is “promoting the principles of integrated water resources management” (MoWR 2001, 2), also attempting to mitigate the expected effects of climate change. Irrigation management transfer is increasingly promoted as a tool to manage demand in IWRM to both reduce costs and increase participation. In line with more general structural adjustment programmes starting in the 1980s, irrigation management transfer as one form of privatization has been supported by many of the major international development banks (FAO 2001; cf. EDI 1996). However, the form that management transfer can take varies greatly from scheme to scheme.

While by its design the Koga project was envisioned as the first large-scale irrigation scheme to be managed by the farmers themselves, inconsistencies arose during the implementation phase concerning what parts of the scheme the farmers were actually going to manage and what parts should remain under state responsibility. Interpretation of the envisioned “self-management by the beneficiaries” has been inconsistent and undergone a number of changes that can be tracked via the rich project documentation. While in 2001 the division of management duties was outlined in spatial terms (infrastructure down to secondary canals managed by experts; infrastructure up to secondary level managed by farmers), the entire responsibility and duty of management and operation were only ascribed

to the beneficiaries in 2004 by the Cooperative Promotion Bureau (MMD 2005) in the course of establishing an irrigation cooperative (IC). Then the organizational framework was changed back to the initial plan of a jointly managed scheme intending to rely on the professional Project Management Unit to take care of the primary and secondary structures and support the nonprofessional IC in fulfilling the remaining duties. The legal status of the IC, however, remains unspecified. The title was usually applied by farmers and officials in an undifferentiated way from Water Users' Association, which is the form of farmers' organization put forward by the Ministry of Water Resources. Similar to other case studies, "no institution like the WUA formally exists. However, farmers mention them[;] . . . they claim to be a member of it" (Leidreiter 2010, referring to West Belisa). The "nonexistence" of WUAs is due to the fact that in Ethiopia the term usually refers to groups of farmers who organize irrigation themselves without official registration, while cooperatives are legally recognized by the Cooperative Societies Proclamation No. 147/1998. These nonprofit WUAs focus solely on water distribution, management, and operation of the infrastructure, but are "sometimes threatened by parallel established government-supported cooperatives which have broader operational scopes and have stronger links with government institutions" (Haileselassie et al. 2008, 35). However in the Koga case, both the existing IC and a potential WUA would be government-installed rather than driven by farmers.

Donors have contributed to this conceptual and legal confusion as well since they have imposed the internationally established concept of the WUA. As the World Bank stated with regard to the Ethiopian Nile Irrigation and Drainage Project, "Water users in Ethiopia have so far been mostly organised into legally recognized Water Users Cooperatives. . . . The project will sensitize communities on WUAs and encourage the formation of these in view of the comparative advantages as demonstrated in other countries" (World Bank 2007, 61). In 2009, the World Bank published a draft for the proclamation of WUAs, as well as for the establishment of by-laws and contract agreements, "to assist the Government of Ethiopia in the definition and adoption of the legal framework for the establishment of Agricultural Water Users Associations for the sustainable development and management of irrigation and drainage infrastructure" (BRLI 2009, 1).

This situation leads to disagreement between the involved agencies, contradicting the allegedly integrated approach:

The Agency for Cooperative Promotion of the Amhara National Regional State has initiated the formation of the Koga Irrigation Cooperative. This is quite substantial. But, the articles referenced from the proclamation pertaining to the establishment of cooperatives are not in most cases suitable for the establishment of an irrigation management organization, namely an IWUA. This has been contentious between the Consultant on behalf of the Client [i.e., the MoWR] and the Agency and has been viewed by the latter as an encroachment into what is considered by them as justifiably the Agency's sphere of activity.<sup>3</sup>

Busy with organizational and institutional confusion, the ministries failed to take other, potentially more important issues of participation into account. This failing led to a situation in which the process of decision making within the farmers' organizations substantially reproduced social inequalities: those who already possessed power in the respective community also filled the most important positions in the irrigation cooperative.

#### LOCAL REPRODUCTION OF POWER RELATIONS IN IRRIGATION MANAGEMENT

The mechanism of reproducing power is rather simple according to both the leaders' perceptions of why they were voted in and the members' statements on why they voted for someone. According to interviewees, the most important characteristics a person had to have in order to be voted for were (in descending order of importance) literacy and experience dealing with government officials. The criterion of literacy reduces the number of possible candidates considerably, as about 80 percent of the rural population in Amhara are illiterate. It also makes the election of women to leadership positions even less likely considering the difference between male and female literacy (around 30 percent and 10 percent, respectively; see Shenhut 2005). During research, no women were or had been active in any position of the cooperative.

Because basic literacy (as well as mathematical literacy) is crucial to fulfilling the tasks that come with the official positions in the organization, the reproduction of power along already established hierarchies makes perfect sense in a technocentric understanding of farmers' institutions. The problem is rather that the needed basic skills cannot be acquired by most.

The second point, namely, the capacities required to deal with government officials, especially applies to the higher positions in the organization and narrows the potential candidates to a small proportion of politically active people. Being familiar with handling administrative affairs and dealing with bureaucratic structures in the rural context usually comes with working for political parties or administration at the kebele, or peasant association, level (the smallest administrative unit of Ethiopia).

In this context, it is important to understand that the administrative institution of the kebele was established by the Derg regime in 1975 as a political instrument through which the regime "literally controlled every village and every human activity in the vast rural areas of Ethiopia" (Aadland 2002, 36). The kebele also played an important role in the prosecution of political enemies during the Red Terror campaigns. Although the leaders of the kebele were replaced after the downfall of the Derg, the structures were not, and the new ruling party could soon restore control through their own executives within the kebele structures (Pausewang 2002, 98). Over time, this newly exerted control from above increasingly resulted

in a situation in which the “kebele are once again monitored and run by political cadres” (Aadland 2002, 36). Most of the IC’s board members held such a position in the past or are still active in local party politics.

## CONCLUSION

As the study has shown, food security in Ethiopia is, in many respects, a political problem. Earlier research on disasters and on famines, in the Horn of Africa in particular, suggests, as pointed out earlier, that vulnerability to droughts “is known to arise from political marginalization rather than either technical deficiencies or the vagaries of the weather. . . . In brief, the real issues underlying the persistence of famine are about the lack of political inclusion, not the lack of technical interventions” (Lautze and Maxwell 2007, 239 f.).

The multiscale analysis revealed how policy narratives on the character of water resources management in general and irrigation in particular travel between the political scales. New policies and paradigms that are produced as an effect of changing global discourses have concrete impacts on power relations between actors at different scales.

The case study showed that global paradigms of how irrigation water is supposedly managed are best manifested on the local level through the intervention of the state. The “WUA discourse” is a good example. Farmers had to deal with the contradiction of being pushed to change farming practices for commercial production as a result of IWRM-related policies, although the necessary inputs for this were not available to them. These underlying reasons for farmers’ “conservative” behavior went unnoticed in the ministerial debates. A closer look at the linkages between the different political domains reveals that while global politics and institutions constrain the agency of the state by imposing certain policies on it, they also enable government actors to pick and choose from available discourses.

Climate change legitimizes infrastructure development in the face of transboundary hydropolitics. The Ethiopian government can extend its scope of agency with reference to the rather new issue of climate change and the surrounding policies like the NAPAs. However, while the implementation of irrigation projects, like the one in Koga, might mitigate the severity of disastrous water-related events, it does not necessarily lead to a decreased *vulnerability* to floods and droughts on the local level. Current disaster research points out that marginal groups are more vulnerable to disruptions, while elites, both local and national, might even be able to strengthen their position. Thus any means taken to mitigate possible impacts of climate change and resultant extreme events have to effectively include those most vulnerable groups. Otherwise, existing inequalities within our “species” are likely to increase to the detriment of those who have contributed little to the sociogenic changes that the Anthropocene brings about.

## NOTES

1. Publications reflecting such degradationist discourse include *The Population Bomb* by Ehrlich (1968), "The Tragedy of the Commons" by Hardin (1968), and *The Sinking Ark* by Myers et al. (1979).
2. NAPAs are a reporting process for Least Developed Countries to the United Nations Framework Convention on Climate Change (UNFCCC). These national reports are meant to identify priority activities that respond to immediate needs to adapt to climate change.
3. Unofficial working paper, "Irrigation Water Users' Association: Concept and Concern," by an MoWR training officer.