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One size fits all? Institutional design: lessons from two Malawian examples

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Abstract: This article observes two examples of attempted institutional design in Malawi's central region, Kasungu. In both cases external development actors enter local communities, and establish infrastructure to exploit two common sources of water. One is the exploitation of a river for group irrigation, the other a borehole to facilitate appropriation from a source of ground water. In both cases the infrastructure is accompanied by elaborate schemes of governance, ignoring the pre-existing social and bio-physical traits of the area. The results are two non-robust systems, collapsing under the weight of latent conflicts fuelled by the areas pre-existing institutional and bio-physical configuration. Using the framework of robustness in Social-Ecological Systems as a practical-analytical tool, the entities of the two systems are identified and their failure illustrated. The particular lessons drawn from the two cases are transformed into five general points meant to stimulate both development practitioners and future research endeavors.

Keywords: Africa, common pool resources, institutional design, institutions, irrigation, Malawi, water

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1. Introduction

The difficulties of managing common pool resources (henceforth referred to as CPR) have been well illuminated through decades of research (e.g. Hardin 1968; Hardin and Baden 1977; Ostrom 1990, 2005; Ostrom et al. 1994; for well-known examples). This article scrutinizes two efforts at implementing solutions to some of the problems identified in the literature. Two cases from a rural area in Kasungu, Malawi are studied – a small scale group irrigation scheme and a borehole providing clean drinking water. In both cases the tasks of public infrastructure-provision and solving CPR-dilemmas are sought through top-down implementation of institutional arrangements and collective choice mechanisms crafted by development actors from outside the local community.

A voluminous body of empirical literature suggests that bottom-up decentralized CPR-management is more efficient than governance by rules established top-down by remote actors (e.g. Tang 1991; Ascher 1995; Lam 1998; Ostrom et al. 1999). There are also examples of this from Malawi; a recent account describes how an irrigation scheme "parachuted" into a local site by development agents failed miserably (Veldwisch et al. 2009). These insights raise interesting questions for the cases at hand. Are the institutional arrangements crafted by the outsiders able to deliver the promised infrastructure and community benefits? Further, how robust are the schemes? What are the outcomes when two sets of designed collective-choice arrangements encounter a series of pre-existing institutional and bio-physical conditions?

To shed light on these questions the framework of robustness in Social-Ecological Systems (SES) as outlined by Anderies et al. (2004) is mobilized. The framework offers a gateway towards assessing the interplay among the resource at hand, the resource users, public infrastructure and public infrastructure providers. It offers a suitable tool for analysing the outcome of natural resource commons processes in terms of establishing whether or not they are sustainable. Through visualizing the active entities contributing to the end-result in the two cases this article aims to mobilize the framework as a practical-analytical tool.

2. The framework of robustness in social-ecological systems (SES) as a tool for analysing commons outcomes

The framework of robustness in SES outlined by Anderies et al. (2004) and later by Janssen and Ostrom (2006) is a useful tool for analysing entities and links between them in intertwined systems consisting of social and biophysical entities. The authors show that the components of systems like this typically includes 1) a resource, 2) public infrastructure, 3) public infrastructure providers and 4) resource users. The two cases studied in this article are precisely of this character. Table 1 provides a brief description of the two cases with this in mind.

To comprehend the possible complexity of SESs and explain robustness or non-robustness there are two types of key drivers that must be accounted for. The first is *strategic interactions*. This has been the traditional focal point for CPR

Table 1: Entities in the Irrigation and borehole case study.

	Irrigation	Borehole
Resource	Water source (river)	Water source (ground water)
Resource users	Farmers from seven villages	Residents in two villages
Public infrastructure providers	Catholic Development Commission of Malawi (CADECOM), locally elected committees, local clubs, leadership, "engine boys", Malawian government, resource users	Malawi Social Action Fund (MASAF), local committee, chiefs family
Public infrastructure	Water canals, plots of land, treadle pumps, manure, engine pump, gasoline	Borehole

analysts. A shortcoming, however, has been the sole focus on resource users, and the incongruence between individual and collective rationality. A key question in these accounts is how collective action and cooperation among resource users can be achieved (e.g. Ostrom et al. 1994; Kollock 1998). Anderies et al. (2004) ask for a broader analysis of strategic interaction, which can be found within and between all entities in the SES, for instance between resource users and public infrastructure providers.

The second aspect deals with *operational rules and collective-choice processes*. While most institutional analyses of SESs focus either on the harvesting decisions (operational processes) or the policy choices made by infrastructure providers (collective-choice processes), the authors argue that these cannot be analysed separately. Instead they call for a broader approach where individual decisions by resource users are analysed together with the policies crafted to steer these decisions in the desired direction.

If the system produces the looked-for benefits, like irrigated crops or clean water, robustness is a desired quality. Robustness is defined as "*the maintenance of some desired system characteristics despite fluctuations in the behaviour of its component parts or its environment*". Thus, the acid test for robustness in SESs is the system performance in the face of internal or external disturbances. Internal disturbances could for instance be conflicts between fractions of resource users, or gradual damage to the infrastructure as result of the resource users' actions. Typical external disturbances could be an earthquake, or rapid political changes affecting the system. Robust systems are adaptive and survive, while its non-robust counterparts collapse.

To examine robustness, the authors uphold that at least three questions must be answered. (1) What is the relevant system? (2) what are the desired system characteristics? and (3) when does the collapse of one part of an SES imply that the entire system loses its robustness?

3. Methods

Most data analysed in this article was generated through a series of semi-structured, in-depth qualitative interviews conducted from June 15th to August 10th, 2007.

Rather than aspire for statistical generalization or representativeness qualitative research aims to reflect diversity in a given population (Kuzel 1992). One way to reach this goal is through a purposive method of sampling (Curtis et al. 2000; MacDougall and Fudge 2001). The respondents were chosen from the population of resource users and public infrastructure providers in the two schemes, and amounted to around 20 interviews in both cases, 40 altogether. This represents 25% of the participant households in the irrigation scheme, and around 10% of the households using the borehole. Thus, although not suited for statistical analysis, the data is sufficient to carry out a well-informed qualitative analysis of the cases. Efforts were made to include people from all layers of the organizations and to elucidate all sides of possible conflicts. The topics discussed were informed by both theoretical insight, and continuously expanded knowledge about the cases. Interpreters were used[1], and the interviews ranged in length from 50 minutes to 2 hours. In addition to formal interviews, the article draws on informal conversations with representatives from the involved development agents, countless informal talks with locals and close to two months of observational data.

Alongside this material the analysis draws on textual information. This includes record and receipt books from both cases and records by the NGOs involved. The NGOs involved in the irrigation scheme kindly made available a number of monthly reports on the progress of the scheme, as well as plans of action and presentational material.[2]

4. Case studies

4.1. Case 1: An institutional blueprint for irrigation management

The first case is a small-scale irrigation scheme originally based on CADECOMs Livelihood Strategies Eliminating Needs project (LISTEN). However, the scheme has been through two phases – the first with CADECOM in charge, the other with the Malawian government in control.

4.1.1. Phase 1: CADECOM implements the LISTEN-scheme

Through setting up an elaborate set of groups, committees and clubs the LISTEN project combines group-irrigation with livestock-clubs (poultry and pigs). Its main objective is to "*Increase households' resilience to food security shocks*" (CADECOM 2007, 2). The plots of land irrigated in the scheme are not owned by the farmers involved, but can be borrowed on a seasonal basis. As of January 2007 eight communities in Kasungu irrigated crops through the LISTEN-scheme (Chimseu 2007). CADECOM aims to enrol 15 new communities (1000 households, 5500 individuals) by September 2010 (CADECOM 2007). The scheme studied in

[1] The native tongue of the region is Chichewa. There are methodological problems tied to the use of translators, like loss of information in the process. See Myers and Newman (2007) or Kapborg and Bertrö (2002) for discussions.

[2] For a more detailed description and discussions on methodology see Skjølsvold (2008).

this article has failed and experienced collapse. Given the plans of expansion, and Malawi's relatively recent encounter with famine (Deverux 2002) it seems vital to identify the factors contributing to failure.

In written material the LISTEN-project identifies several barriers to combining irrigation and livestock clubs. Diseases and theft are highlighted as the two main obstacles. Advocated solutions include vaccination and setting up security systems. A third barrier is identified as "achieving sustainability". The suggested solutions include "establishing committees" and keeping a savings account in a bank (CADECOM 2005). Figure 1 is an adaptation of Anderies et al. (2004) conceptual model of an SES depicting the entities in the irrigation scheme and the links between them as they were envisioned by CADECOM.

The scheme was designed to counter many things perceived as problematic by CADECOM. The farmers from seven villages were organized in seven clubs. These would elect two committees – one in charge of establishing and monitoring rules, organizing the collection of funds, annual construction of mud-canals, and maintenance activities. The other would oversee the scheme and report back to CADECOM. Funds would be generated through fees paid by the farmers and the two livestock clubs.

This setup was introduced to a pre-existing environment where strong social and physical conditions influenced its outcome. In particular two informal institutional arrangements greatly interfered with the designers plans, first, the power vested in the system of Malawian traditional authority and chieftaincy. This grants local elites privileges. Wealth, social status, and de facto legal immunity are all benefits enjoyed by this group. Second, there was a less tangible division between the involved villages. Not only were there seven individual villages, there were two clusters of villages, divided by social and geographical boundaries. One cluster was located close to the river. This group had strong feelings of ownership towards the scheme, while the "others" were perceived as outsiders, less legitimate

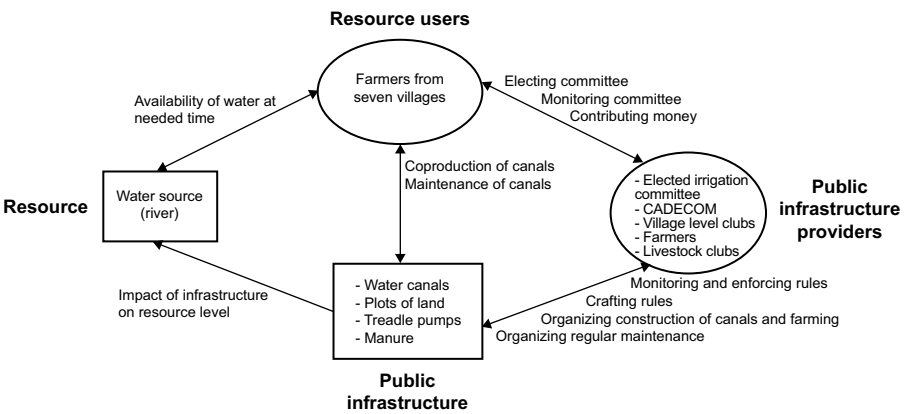

Figure 1: Irrigation design by CADECOM.

resource users. The clusters were also linked to different group village leaders, a powerful position in the traditional power structure of the region.

In practice the differences resulted in a skewed distribution of power and resources during the first season of irrigation. The group close to the river seized control of the treadle pumps and established a rental market with higher prices for the "others". The people from the villages close to the river were also favoured in the allocation of time slots for irrigation and use of the canals. Further, the main irrigation committee was restructured twice during the first season, tilting the balance of power further towards the group close to the river. The first time this was done because of allegations about corruption, the second time because of rumours about alcoholism and poor morale. The path towards the end result remains unclear, but the second time the committee was not elected and the collective choice arrangements ended up in the hands of two individuals closely tied to traditional leadership. Unfortunate circumstances also led to the collapse of the swine population in an outbreak of African swine fever, leaving the group with just the poultry club for support.

Despite many problems the scheme was relatively successful in terms of improving food security over the first season. Most farmers reported being able to harvest twice in a season, once was the norm prior to the implementation of the schemes.

4.1.2. Phase 2: Government up-scaling

Word of the relative success of the scheme's first season soon reached representatives from the Malawian central authorities. Small-scale irrigation was a key component in their strategy to develop the country's rural areas, and they wanted to improve the project further. An engine pump and gasoline was provided together with 500,000 Malawi Kwacha (MK). As far as training goes, two locals – both from the village cluster close to the river were trained in operating the engine. These would be known in the area as "the engine boys". More serious engine-maintenance would be performed by extension workers located elsewhere.

The development upset CADECOM who withdrew from the project. According to their representatives it was "*all too common that the government inflated schemes with cash*". The poultry club was detached from the rest of the scheme; the irrigation club was now a stand-alone operation. Once the government had carried out the training the group was left alone. Still, optimism prevailed in the area and the participation from the seven villages was at an all time high.

The government intervention in the scheme had several unforeseen consequences. First, it was decided that the members no longer needed to contribute funds. The collective choice arrangements were left in the hands of the two individuals closely linked to the traditional authorities, there would be no more elections. This could happen because of the tight links these individuals had to the traditional leadership[3] and the immunity this created. Further, the "engine

[3] Sister and wife of group village leader.

boys" became a factor deepening the divide between the irrigators living close to the river and the others. The engine boys were needed to start the engine, a task they happily carried out for "their own", while they were often reluctant to do this for the others, demanding small bribes to do so. In practical terms, this meant that access to the resource and access to the infrastructure was not equally distributed among the resource users. Figure 2 incorporates the informal institutions of the area and the external forces pressuring the setup, and depicts the scheme as it looked in the second season of irrigation after the government's intervention.

The scheme was operational for nearly another season before it degraded into pure conflict over money, gasoline, access to, and use of water and infrastructure, and control over the engine. Today the collective group irrigation scheme has collapsed, left are a few individuals irrigating their separate plots of land with the old treadle pumps.

4.2. Managing a common source of drinking water

The second case is less ambitious both in terms of complexity of collective choice arrangements and infrastructure. The Malawi Social Action Fund (MASAF) sponsored the construction of a borehole providing clean drinking water for two villages. They provided a roadmap of governance, stating that the resource users should elect a committee of 10 peers. This committee would organize maintenance and cleaning, collect fees from individual users and create and monitor rules. Figure 3 depicts the scheme as envisioned by MASAF within the conceptual model of an SES by Anderies et al. (2004).

As with the first case this scheme was introduced into a complex pre-existing structure of institutional arrangements. First, the borehole would cater for the needs of two villages. Villages, here, are not clusters of houses with physical boarders, but social entities with fluid boundaries defined by family affiliation

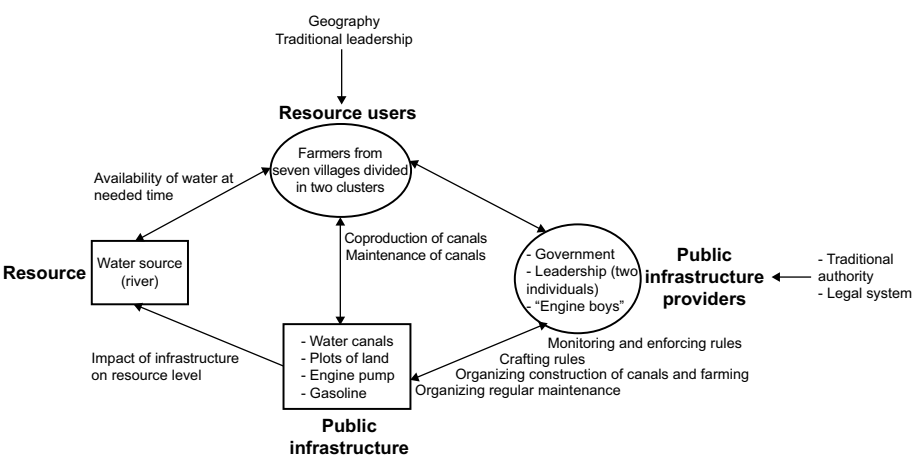

Figure 2: Irrigation result.

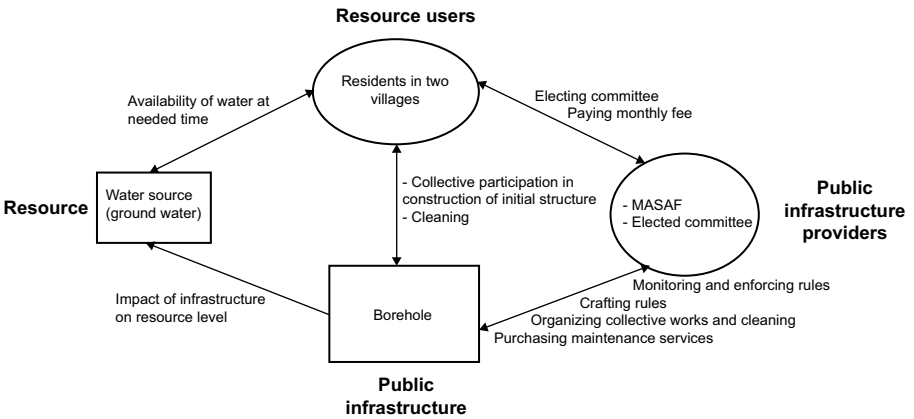

Figure 3: Borehole design by MASAF.

or other intangibles. As in the rest of Malawi labour migration is a potent social force in the area (Mtika 2007). This has created tension between those originating in the area, often labelled "villagers" and those moving in, often called "traders", resulting in high levels of distrust between the two (Bjørnstad 2008). "Villagers" and "traders" live in separate villages, which I will refer to as "traditional villages" and "trader villages". The power structure of traditional villages is closely tied to the traditional authority of chieftaincy, while the links between this authority and trader villages are weak. Thus, chiefs in trader villages do not enjoy the immunity of traditional village chiefs.

The borehole was meant to cater for one village of each kind. At the time of construction the borehole was "located" on what was conceived as trader-territory. A committee of 10 resource users was elected, with both "traders" and "villagers" involved. The committee established a number of rules, most of them to ensure that the water source would stay clean. For a while the system appeared to be a sound, stable and sustainable way to provide water.

However, after about a year or so the pre-existing institutional conditions of the area would change the systems character. The fluidity of boundaries became manifest in the fact that the borehole location was re-defined as traditional village-territory.[4] Knowing that he would not be punished, the chief of the traditional village dethroned the committee and appointed a new group of leaders, all in his immediate family. He assumed a separate role, outside the official leadership, but responsible for punishing non-compliance with rules. Prices for using water for certain tasks (brick making, brewing beer, and other commercial activities) were changed; "villagers" paid less than "traders". Penalties for violating rules became

[4] This happened because a de facto pre-existing village became legally recognized as a traditional village by the areas' traditional authority. Thus it gained a series of new powers associated with this institutional structure which it could now exercise.

harsher for "traders". In short, the distribution of costs and benefits tied to being a resource user became very uneven. Further, the new leadership of the scheme saw the potential for establishing a new business. Fuelled by the knowledge that they would not be punished they started lending out the money obtained through monthly fees, leaving the scheme short of cash and vulnerable should it need maintenance. This was apparent; there were damages in the concrete structure and clear signs of imminent breakdown. The leadership, however, was unable to produce the funds needed to handle maintenance.

Still, the physical infrastructure remained intact, but it would clearly not remain so without changes in governance. Figure 4 depicts the borehole outcome in the same framework as used in the first three figures.

5. Discussion

The two cases presented in this article are examples of CPRs in the form of SESs. Both illustrates the need to broaden the analytical focus beyond the incongruence between individual and collective rationality when trying to understand CPR dynamics (Anderies et al. 2004; Janssen and Ostrom 2006). While much literature highlights the importance of solving commons dilemmas between resource users to establish cooperation (Sandler 1992; Udéhn 1993; Ostrom et al. 1994), the commons dilemmas in the cases studied are also faced by de facto infrastructure providers, frequently failing to act for the benefit of the collective. This, of course, is not to say that interaction between individual resource users is of no importance.

In both examples external agents enters small communities, establish parts of the infrastructure needed to exploit the resource and provide a configuration for collective choice arrangements. As such the schemes can be placed in a long tradition of unsustainable top-down approaches to institutional design (Shah et

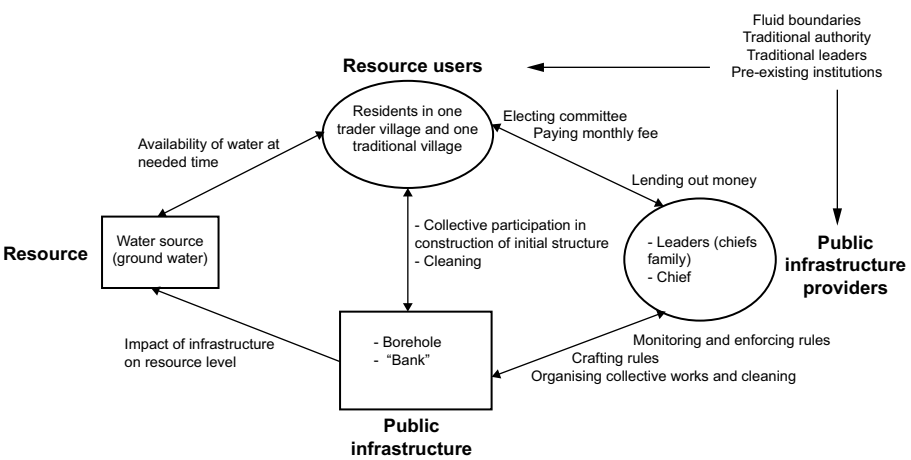

Figure 4: Borehole result.

al. 2002). Faced with external pressure emanating from pre-existing institutional- and bio-physical conditions of the area, the operational rules crafted by the development agents crumble. The informal rules tied to the relationship between traditional authority and the rest of society is of particular importance.

An explanation for the downfall resonating well with empirical literature on similar situations is lack of knowledge about the situation "on the ground" by development agents and the disharmony between existing institutions and designed solutions (Goodin 1996; Hobley 1996; Mandondo 1997; Dolšak and Ostrom 2003). Establishing groups, committees and rules to govern resources without consideration of pre-existing conditions have been problematic in the past (Nemarundwe and Kozanayi 2003), and it is problematic in this account. Veldwisch et al. (2009) claims that developers and donors are biased by a long-prevailing mindset postulating that developing poor rural African areas are best achieved by turning them into a particular type of modern full-time farmers, governed by particular types of institutions. This seems prevalent at least in the irrigation scheme, where modern technology and funds were perceived as magic wands which would transform the area.

In the cases studied here, particularly in the irrigation scheme, rapid reconfiguration of the CPRs governance in the image of pre-existing institutions, social groups and geography prompted severe imbalances in the systems. Collective choice arrangements were left in the hands of local elites, a development known to frequently result in poor policy and low efficiency (Ostrom 1990, 2005). An extension of this was that the equivalence between costs and benefits for different resource user groups became skewed; another trait regularly identified as unfortunate (Ostrom 1990, 2005). A fundamental challenge for institutional designers is to design institutions that are not vulnerable to capture by subsets of the community who can direct the institution against the overall social interest (Brock and Carpenter 2007). In both cases studied the institutions were hijacked by small subsets of the resource users drawing legitimacy from pre-existing institutional conditions.

In addition to underlining the need to analyse links between resource users and public infrastructure providers, Anderies et al. (2004) call for focus on the links between the resources, the public infrastructure and the resource users. The resources (river and ground water) have been given little attention in this account. This is mainly because of the scale of the two schemes; none exploit the resources to such an extent that their existence is threatened by over-exploitation. Availability of water, however, is not a reliable indicator of robustness (Bueno 2008). In these cases, the external and internal disturbances testing the systems robustness are mainly found in the interplay between the social domains (resource users, public infrastructure providers and pre-existing institutional conditions) and the public infrastructure. This is a firm remainder of the fact that funds and technology needs to be accompanied by governance and institutions which are suited to match the donor or development effort at hand. It is a well-established fact that blueprint solutions or panaceas to solve all social dilemmas related to commons and SESs are non-existent (Ostrom 1990, 2005, 2009; Kollock 1998;

Dolšak and Ostrom 2003; Brock and Carpenter 2007). Meinzen-Dick (2007) emphasizes that this general point is also true when it comes to the particular case of water management. Thus, the development agents first hand knowledge about power structures, social structures, rules, and institutions of a given area is a key for achieving success.

On a brighter note, the fact that these systems collapse rests mostly in the social domain, and the fact that physical destruction is limited to infrastructure, and not resources, should be of some comfort. The resources and their potential to increase food security and better sanitation are still there; available for exploitation in the future.

6. Conclusions

Drilling boreholes and establishing small-scale group irrigation schemes are two relatively cheap and technically simple ways to improve sanitation and food security in areas where the needed water resources are available. The examples described in this article illustrates that we should not confuse technical ease with guarantee of success. Local institutional and bio-physical realities are not necessarily susceptible to the schemes drawn up by outsiders. This is a key insight, which development agents and donors should keep in mind when crafting solutions. When this is not done the result might be failing infrastructure, collapse of the social systems. Ultimately the development efforts might not produce the intended benefits. And in the worst case one might do more harm than good.

Inspired by the cases at hand and moving beyond this relatively general point of advice it is possible to extract at least five specific points which may serve as inspiration for agents aspiring to design resource management institutions, as well as for future research endeavours:

1) When planning CPR-regimes or in other endeavours of institutional design, designers should familiarize themselves with local norms, rules, value-orientations and power-structures. Knowing the socio-institutional and bio-physical traits of an area is vital.
2) A practical way to do this is to identify activities in the local community which structurally resemble what you are trying to achieve. If these activities are successful, try to determine which mechanisms are at play. Use the knowledge acquired actively in the institutional design process.
3) Avoid transplanting blueprint solutions or panaceas which have been successful elsewhere without considering and trying to understand why they have succeeded. Consult the literature and learn from past successes and failures.
4) In rural settings long-term storage of resources in general and money in particular is a non-trivial problem. Developing savings-institutions that will be trusted by all appropriators should be a focal-point for researchers and developers alike.

5) A key issue is the relationship between attempted institutional design and existing power structures, particularly those who profit from status quo rather than from social and economic growth. The breaking of the usual path dependency is a big challenge, one that this article is not equipped to handle. Further research on this issue is needed.

The message of this article has been relatively simple. Two case studies show that institutional design is a difficult task. Attempts at cutting through pre-existing institutional conditions to craft a new social order needs to be fuelled by a thorough understanding of the pre-existing conditions at hand, so that sustainable, robust and adaptive regimes may be established.

Literature cited

Anderies, J. M., M. A. Janssen, and E. Ostrom. 2004. A Framework to Analyze the Robustness of Social-ecological Systems from an Institutional Perspective. *Ecology and Society* 9(1):18.

Ascher, W. 1995. *Communities and Sustainable Forestry in Developing Countries*. San Francisco: ICS Press.

Bjørnstad, S. 2008. *Rationality and trustworthiness. An empirical study of a borehole and irrigation project in rural Malawi*. MA-thesis. Institute for Sociology and Political Science, Norwegian University of Science and Technology.

Brock, W. A., and S. R. Carpenter. 2007. Panaceas and diversification of environmental policy. *Proceedings of the National Academy of Science* 104: 15206–15211.

Bueno, N. P. 2008. Understanding the concept of robustness in social-ecological systems: definitions and evaluation. Presented at a colloquium at the Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington, February 18, 2008.

Catholic Development Commission of Malawi. 2005. LISTEN project: Community action plan.

Catholic Development Commission of Malawi. 2007. Presentation of Livelihood Strategy for Eliminating Needs (LISTEN) Project Kasungu South.

Chimseu, L. 2007. *Monthly narrative report for January, 2007*. Kasungu: Lilongwe CADECOM sub office.

Curtis, S., W. Gesler, G. Smith, and S. Washburn. 2000. Approaches to sampling and case selection in qualitative research: examples in the geography of health. *Social Science & Medicine* 50:1001–1014.

Deverux, S. 2002. The Malawi Famine of 2002. *IDS Bulletin* 33:70–78.

Dolšak, N., and E. Ostrom. 2003. The Challenges of the Commons. In *The Commons in the New Millenium*, eds. N. Dolšak, and E. Ostrom, 3–34. London: The MIT Press.

Goodin, R. E. 1996. Institutions and Their Design. In *The Theory of Institutional Design*, ed. R. E. Goodin, 1–53. Cambridge: Cambridge University Press.

Hardin, G. 1968. The Tragedy of the Commons. *Science* 162:1243–1248.
Hardin, G., and J. Baden. 1977. *Managing the Commons*. San Francisco: W. H. Freeman
Hobley, M. 1996. *Institutional Change within the Forestry Sector: Centralized Decentralization*. Working paper 92. London: Overseas Development Institute.
Janssen, M. A., and E. Ostrom. 2006. Governing Social-Ecological Systems. In *Handbook of Computational Economics, Volume 2*, eds. L. Tesfatsion, and K. L. Judd.
Kapborg, I., and C. Beretrö. 2002. Using an Interpreter in Qualitative Interviews: Does it Threaten Validity? *Nursing Inquiry* 9:52–56.
Kollock, P. 1998. Social Dilemas: The Anatomy of Cooperation. *Annual Review of Sociology* 24:183–214.
Kuzel, A. J. 1992. Sampling in Qualitative inquiry. In *Doing Qualitative Research: Multiple Strategies*, eds. B. F. Crabtree, and W. L. Miller, 31–44. London: Sage.
Lam, W.-F. 1998. *Governing Irrigation Systems in Nepal: Institutions, Infrastructure, and Collective Action*. Oakland: ISC Press.
MacDougall, C., and E. Fudge. 2001. Planning and Recruiting the Sample for Focus Groups and In-Depth Interviews. *Qualitative Health Research* 11:117–126.
Mandondo, A. 1997. Trees and Spaces as Emotion and Norm Laden Components of Local Ecosystems in Nyamaropa Communal Land, Nyanga District, Zimbabwe. *Agriculture and Human values* 14:353–372.
Meinzen-Dick, R. 2007. Beyond panaceas in water institutions. *Proceedings of the National Academy of Science* 104:15200–15205.
Mtika, M. M. 2007. Political Economy, Labor Migration, and the AIDS Epidemic in Rural Malawi. *Social Science and Medicine* 64:2454–2463.
Myers, M. D., and M. Newman. 2007. The qualitative interview in IS research: Examining the craft. *Information and Organization* 17:2–26.
Nemarundwe, N., and W. Kozanayi. 2003. Institutional arrangements for Water resource use: A Case study from Zimbawe. *Journal of Southern African Studies* 29:193–206.
Ostrom, E. 1990. *Governing the commons*. Cambridge: Cambridge University Press.
Ostrom, E. 2005. *Understanding Institutional Diversity*. Oxfordshire: Princeton University Press.
Ostrom, E. 2009. A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* 235:419–422.
Ostrom, E., and R. Gardner. 1993. Coping with asymmetries in the commons: Self-governing irrigation systems can work. *The Journal of Economic Perspectives* 7:93–112.
Ostrom, E., R. Gardner, and J. Walker. 1994. *Rules, Games & Common-Pool Resources*. Michigan: The University of Michigan Press.
Ostrom, E., J. Burger, C. B. Field, R. B. Norgaard, and D. Policansky. 1999. Revisiting the Commons: Local Lessons. *Science* 284:278–282.

Sandler, T. 1992. *Collective Action: Theory and Applications*. New York: Harvester Wheatsheaf.

Shah, T., B. Van Koppen, D. Merry, M. De Lange, and M. Samad. 2002. *Institutional Alternatives in African Smallholder Irrigation: Lessons from International Experience with Irrigation Management Transfer.* Colombo: International Water Management Institute.

Skjølsvold, T. M. 2008. *The institutional reality of common pool resources*. MA-thesis. Institute for Sociology and Political Science, Norwegian University of Science and Technology.

Tang, S. Y. 1991. Institutional arrangements and the management of common-pool resources. *Public Administration Review* 51:42–51.

Udéhn, L. 1993. Twenty-five years with the logic of collective action. *Acta Sociologica* 36:239–261.

Veldwisch, G. J., A. Bolding, and P. Wester. 2009. Sand in the Engine: The Travails of an Irrigated Rice Scheme in Bwanje Valley, Malawi. *Journal of Development Studies* 45:197–226.