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Applying systems thinking approaches to overcome intractable governance challenges in the water sector of Malawi

Sydney Byrns*[1], Richard Quilliam[1], Tracy Morse[2], Ellis Adams[3], Heather Price[1]

Introduction

Malawi was one of the few nations to meet the Millennium Development Goal for water access, reaching rural water supply coverage of 85% by 2015 (United Nations Development Programme, 2015). However, many doubt the sustainability of this achievement, given that functionality rates have stagnated at around 70% for the last few years (Government of Malawi, 2019). There is ongoing debate surrounding the capacity for local government service delivery and the effectiveness of community-based management upon which the sector relies (Chowns, 2015). For Malawi, this evidence suggests that the recent global shift towards the Sustainable Development Goals (SDGs) could be more appropriately framed as a need to strengthen water governance. In the push to localize the SDGs, many non-governmental organisations (NGOs) are looking to reduce the risk of regression and collapse after their projects end. As a result, some NGOs are revisiting their exit strategies, and in particular, plans for what is often referred to as end-of-project "transition."

Such strategies are indirectly seeking ways to nurture a governance system around interventions. The structure of the governance system is defined by the complex network of relationships between decision-makers, which can trigger behaviour that is different from the intentions of the project. It can be hard to see what kind of relationships are emerging, and at the close of a project, NGOs are often inadvertently a prominent part of the governance structure. By mapping the interactions between stakeholders and the decisions that they make, we can start to understand the emergent governance structure and identify opportunities for breaking unwanted dependencies and leveraging unexpected relationships between stakeholders.

WASH Catalysts is a social venture focused on improving water sector governance in Malawi. The venture has adapted ideas and methods from the field of systems thinking to critically diagnose, advocate for, and implement systemic solutions to intractable sector-level challenges. From 2015 to 2018, *WASH Catalysts* conducted critical evaluations of the institutional sustainability of four international NGO projects as they were closing old projects and preparing to expand to other areas. Each project was focused on different aspects of rural water supply, including two typical groundwater infrastructure programs, a network of hand pump mechanics, and a project to implement small-scale solar pumped water schemes.

The aim of this paper is to identify common NGO practices that result in barriers to institutional sustainability of water projects, and how these could be mitigated. A cross-case analysis of four NGO projects was conducted to find similarities in the challenges they faced at the transition stage and the corresponding changes to project design that were developed. Findings suggest barriers can be counterintuitive and are linked to broader theories of working in complex adaptive systems.

Methods

To evaluate the institutional sustainability of the four NGO projects, *WASH Catalysts* used participatory systems mapping that focused on examining the linkages – processes, flows, relationships – between different stakeholders in the system.

In conducting the evaluations, the selection of the evaluator was strategic to the systems approach – i.e. to deeply understand system behaviour as it is and not as it 'should' theoretically be by design

[1] University of Stirling, Stirling, UK, *Corresponding author: s.c.byrns@stir.ac.uk
[2] University of Strathclyde, Glasgow, UK
[3] Georgia State University, Atlanta, USA

(Meadows, 2008). As a group that most often worked embedded in local government offices and community management groups, *WASH Catalysts* had ethnographic knowledge of local stakeholder behaviour while also having an external view of the NGOs and their goals.

The following method was adopted as one that could be relatively simple for organisations to replicate themselves.

i. Key informant interviews: understanding the current system context and behaviour

Preliminary key informant interviews were held with representatives of local government water offices and relevant community level institutions to help understand the general context of the area, how each stakeholder understood the project and its goals, how they came to be involved in the project, what they understood their roles and responsibilities were, who they were connected to in the system, any relevant information about financing and money handling, and perceptions of the post-project situation.

ii. Multi-stakeholder system mapping to identify dependencies and opportunities

Following initial interviews, groups of district and community level stakeholders were brought together, without the presence of NGO staff, to conduct mapping exercises to help visualize existing lines of communication, accountability, and technical, financial, or other support from one stakeholder to another. This allowed the identification of dependencies, breakdowns, as well as possible hidden opportunities in the system.

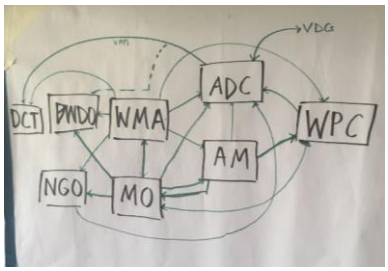

Figure 1*: Example of map of communication lines as described by stakeholders at community level*

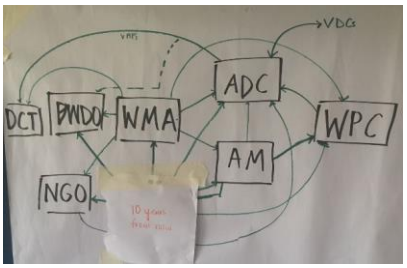

Figure 2*: Identifying dependencies, e.g. "What will happen without the NGO extension worker?"*

In all cases, these maps revealed many direct linkages to NGO staff members. Possible mitigation strategies were generated by asking the group what could be done on their own to keep the system functioning in the future without the NGO staff member, focusing on processes they were already engaged in.

iii. Workshop(s) to identify possible mitigation strategies

NGO staff were asked to brainstorm possible actions to address sustainability concerns revealed through the mapping process. Actions that were rated relatively easy to implement and perceived as more effective were prioritised for immediate action. Actions that were less easy to implement but still deemed important were flagged for future strategy discussions. All actions were assigned to the relevant phases of project implementation at which they would need to be considered, such as initial project design, community mobilization, monitoring, transition, etc.

Results and Discussion

The specific challenges for institutional sustainability and the next steps for project transition for each organisation were context specific. However, when the challenges highlighted in the four individual case studies were analysed together, many similarities in barriers to sustainable project transition emerged. These common barriers with corresponding examples of the system behaviour observed in the case studies are summarised in the table below.

***Table 1**- Barriers to project transition and corresponding examples taken from case studies*

Barriers to project transition	Observations of negative system behaviours from the case studies
1. Dependencies and temporary subsidies	-Communities relying heavily on NGO extension workers as the first line of contact in the face of any issue -NGO providing essential consumables and/or services at below market rates – for example: chlorine, replacement parts, repair services - Turnover of community committees is managed by the NGO until the end of the project
2. Lack of built-in accountability measures	-Public institutions on a community water line fail to pay for the large amount of water they use, financially crippling the scheme -Those responsible for the community water fund personally benefit from not paying water-related bills – for example, chiefs, loan groups -Entrepreneurs who are culturally obliged to provide water services free-of-charge in their own communities – for example, mechanics
3. Internal redundancies that undermine one another	-NGOs providing fast-wearing spares to mechanics in the same area spare parts shops are implemented -Introducing an association at a higher level in the hierarchy that shares the same responsibilities as a group of entrepreneurs at the lower level
4. Building beside the system instead of into it	-Training new people to do new things, instead of training people who are already trusted to do new things (upgrading skills) -Lack of harmonisation with existing management or payment structures in the area – for example: creating new structure adjacent to a larger one instead of widening the remit of existing management; siting a pay-per-use tap beside a free-to-use handpump
5. Seemingly external factors not addressed	-Organisations operating in the same area provide for free what is instituted as fee-for-service by the other -Organisations training more entrepreneurs in an area where there is already a stretched market for those trained by another -Donors of the scheme overriding local water decisions -Local government budgets are dispersed at a rate lower than planned
6. Low or distorted intrinsic ownership	-Community structures feel that they are part of and/or tied to the NGO -Stakeholder roles were given by the NGO (even with “sensitization”) -Misguided expectations that were set during initial community engagement grew into big misunderstandings over time
7. Rigid NGO implementation plans	-Continuing ‘pilots’ of ideas even though they are shown to be undermining the system -Timeframes that do not respond to changing needs or delays -The end of the project is marked by the end of the time allocated or by meeting static indicators rather than by meeting sustainability criteria
8. Putting the solution before the goal	-One-off trainings instead of building capacity on-the job, through mentorship and repetition over time -Unwillingness to harmonise with other systems for the provision of safe water because they are led by other organisations or promote different technologies

By recognising practices that result in these barriers, there is an opportunity for organisations to adapt their approaches to improve post-project sustainability of outcomes. In brainstorming their own shifts in practice to the barriers identified above, the four organisations found that although there were some strategies that must be implemented during project design stages (and in this case meant they could only be considered for new projects), many mitigation strategies could be applied during the implementation and transition stages. This also pointed toward the need for flexibility and new indicators and processes for ongoing monitoring. Strategies are broadly summarised in Table 2 below.

Table 2 *– Generalised strategies to improve institutional sustainability at various project stages*

Project design considerations (Before implementation)	**Mitigation strategies (Implementation and transition)**	**Ongoing monitoring (Throughout the project)**
Introduce system mapping at the project design stage to more deeply understand structures and relationships that are already working Explicitly plan and budget for a transition period at the end of every project to allow a flexible, phased exit Avoid designs that falsely "prop up" the system to make it work, especially through financial inputs	Re-define roles of NGO staff to focus less on the daily management at community level and more on strengthening linkages between existing stakeholders Extend timeframes for a more gradual exit that allows system gaps to be addressed Form alliances with other organisations that could be currently undermining efforts for sustainability	Develop "transition" indicators that signal autonomy of the system, or absence of dependency on the NGO (eg. evidence that stakeholders are carrying out critical responsibilities without external assistance) Integrate processes to regularly monitor emergent governance behaviour in the system and be flexible to adapt to the unexpected

Conclusion

Applying a systems thinking lens to uncover current system structure can be a powerful tool to identify where unwanted system behaviours have originated. The insights in this paper were generated from a handful of examples and framed for an NGO audience that is only a small part of the broader water governance system that exists in Malawi. While practitioners may see the relevance of these insights in directly redesigning their own individual projects, this is unlikely to lead to overcoming systemic governance challenges. At a higher level, the water sector governance system is characterised by similar breakdowns that often result in a lack of coordination, regulation, government capacity for service delivery, monitoring and evaluation, sector financing, community ownership, and private sector involvement, among many others. These challenges have been recognized repeatedly yet remain seemingly intractable, partially because the system itself is constantly evolving and the responsibility for change is diffused across a vast network. The result of so many different actors making decisions within the sector, is a complex web of interactions that produce the behaviour seen at sector level. This is a hallmark of complex adaptive systems, where system behaviour is more than the sum of its parts.

Future research is planned that combines more detailed methods from the field of systems thinking such as Social Network Analysis and causal loop diagramming, while borrowing theories from complex adaptive systems, behavioural economics, and socio-ecological frameworks, to further characterize the decision-making dynamics throughout the sector-wide water governance system and to identify leverage points for change.

Reference List

Chowns, E. (2015). Is Community Management an Efficient and Effective Model of Public Service Delivery? Lessons from the Rural Water Supply Sector in Malawi. *Public Administration and Development*, *35*(4), 263–276. https://doi.org/10.1002/pad.1737

Government of Malawi. (2019). Malawi Irrigation, Water, and Sanitation Sector Performance Report 2018-19.

Meadows, D. (2008). *Thinking in Systems*. Chelsea Green Publishing.

United Nations Development Programme. (2015). The Millennium Development Goals Report. https://www.undp.org/content/undp/en/home/librarypage/mdg/the-millennium-development-goals-report-2015.html (accessed 28 April 2020)