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# State Engagement with Farmer-led Irrigation Development: Symbolic Irrigation Modernisation and Disturbed Development Trajectories in Tanzania

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**ABSTRACT** *Farmer-led irrigation development, a process in which farmers initiate the establishment of irrigation, is increasingly recognised as the driving force behind irrigation expansion, agricultural intensification, and commercialisation in sub-Saharan Africa. Governments and development agencies aim to build upon these practices to further stimulate agricultural production and expand the irrigated area. In what seems the recognition of farmers' ability to take the lead, various African states have developed policies for 'demand-driven irrigation development'. This article scrutinises the actual practices of such a policy through a case analysis of an intervention in Northern Tanzania. The analysis demonstrates how even demand-driven policies can disturb the development trajectory of farmer-led irrigation development by reinforcing modernisation ideals adhered to by both farmers and government employees. An emphasis on the aesthetics of modernity leads to symbolic modernisation, cementing the dominant role of the state and formal expertise and paralysing farmers' irrigation development initiatives. This does not necessarily lead to agricultural intensification and commercialisation, which the formal policies seem to aim for and which is central to processes of farmer-led irrigation development.*

## 1. Introduction

Farmer-led irrigation development in sub-Saharan Africa is increasingly recognised as an important process underlying the expansion of irrigated area, as well as the intensification and commercialisation of agriculture (AGRA, 2018; de Bont, 2018a; Veldwisch, Venot, Woodhouse, Komakech, & Brockington, 2019; Woodhouse et al., 2017; World Bank, 2018). Farmer-led irrigation development is understood as a process in which farmers 'drive the establishment, improvement, and/or expansion of irrigated agriculture' (Veldwisch et al., 2019, p. 2). It is thus a characterisation of a development process, rather than a specific type of irrigation. The definition emphasises an appreciation of farmers' agency and capability to develop and improve irrigation. There is growing evidence that the irrigated area developed by farmers is not captured in official statistics and that in many countries the numbers on irrigation extent would more than double if these areas would be counted (Beekman, Veldwisch, & Bolding, 2014; IWMI, 2016; Lefore, Giordano, Ringler, & Barron, 2019; Scoones,

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Murimbarimba, & Mahenehene, 2019; Woodhouse et al., 2017). The phenomenon thus challenges the primacy of engineering and other expert knowledges (Veldwisch et al., 2019).

The recognition that farmers lead processes of irrigation development with positive contributions to rural and economic development raises the question of how state and development organisations can best engage with it (Lefore et al., 2019; Mdee & Harrison, 2019). That is, it raises questions of where, when, and how to regulate farmer-led irrigation development as well as questions of where, when, and how to support it.

In various African countries, *demand-driven* is the key word in policies stipulating how to engage with farmers (see for instance the irrigation policies of Kenya (RoK, 2015), Uganda (RoU, 2011) and Ghana (RoG, 2011)). Furthermore, the 2018 draft for the ‘Continental Irrigation and Agricultural Water Development Framework’ for Africa similarly states that ‘state agencies should move away from managing the process of identification, design, construction-supervision, and farmer organisation, towards a facilitative and demand-driven approach’ (AU-SAFGRAD, 2018, p. 22).

At its core, a demand-driven approach to development requires communities (or individuals) to actively apply for a type of government support that they feel they are in need of, rather than being identified by external actors as the target of a previously defined development project. The assumption is that this would lead to greater success rates (Baird, McIntosh, & Özler, 2013; Mansuri & Rao, 2004). However, common critiques of participatory approaches are that they often boil down to farmers being co-opted into external agendas (Cooke & Kothari, 2001; Craig & Porter, 1997; Mosse, 2004), that they constitute institutional mechanisms to discipline citizens (Boelens, 2008), and that they benefit those with the capacity to formulate their demands according to the state’s requirements, thereby failing to benefit groups that are disadvantaged and less able to voice their concerns and ambitions (Baird et al., 2013; Carlitz, 2017).

As of yet, no studies exist that critically examine the practices of demand-driven irrigation policies in relation to contemporary farmer-led irrigation development. To fill this gap, this article analyses state engagement with farmer-led irrigation development in Tanzania, a country which possibly has the most explicitly articulated demand-driven policy in the region and a long history of state engagement with ‘traditional’ irrigation (de Bont, 2018b).

To study how the Tanzanian formal policy shapes irrigation development interventions and how elements of these interventions are accepted, transformed, and rejected by farmers and government engineers, we conceptualise policy implementation as an interactive rather than a linear process (Thomas & Grindle, 1990). We use modernisation and modernity as explanatory concepts for why farmers and government officials strive for specific bureaucratic and technological interventions, and particularly focus on the importance of formal technical and institutional expertise, the power of specific aesthetic expressions and symbols of modernity, and the dominant role of the state (de Bont, Komakech, & Veldwisch, 2019; de Bont, Liebrand, Veldwisch, & Woodhouse, 2019; Scott, 1998). We aim to contribute to understanding how notions of modernity influence the dynamics between farmers and (state) engineers in interventions in farmer-led irrigation development and how this influences the development trajectory of farmers’ irrigation initiatives.

In the next section, we conceptualise the role of policy implementation as an interactive process and discuss how the quest for modernity is linked to technological optimism, the reverence for formal technical expertise, the formalisation of messy local institutions, and specific aesthetic representations. We briefly present the methodology underlying this paper and move on to an analysis of Tanzania’s formal policy of demand-driven irrigation. We demonstrate that it reflects modernisation ideals that emphasise agricultural intensification and commercialisation, institutional formalisation, as well as binary thinking on categories of modern and traditional agriculture, linked to the involvement of formal technical expertise. Presenting the case of Mawala, we then make two main arguments. Firstly, farmers participate in government projects due to their aspirations to become ‘modern farmers’, a prospect that is reinforced by external ‘experts’. Infrastructure, institutions, and practices are ‘modernised’, but in a highly symbolic way. Secondly, farmers actively portray an image of a grateful and peaceful community in need, covering

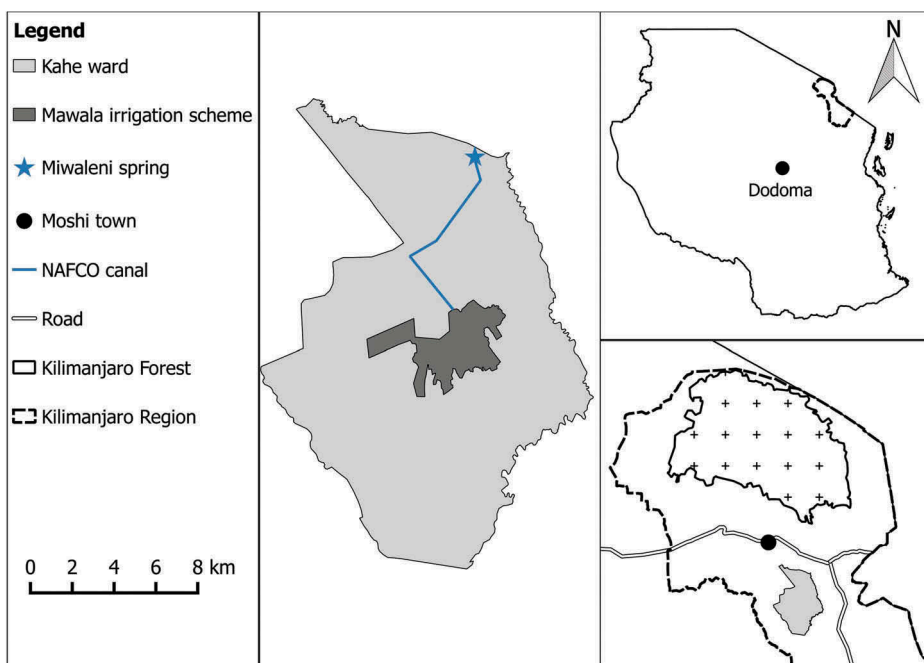
up internal diversity and conflict, as well as their own irrigation development initiatives, thereby strategically reflecting the interveners' ideas of *proper* development. Farmers' desire for modernity and experts' promises that they will bring this thus stimulates compliance and self-censorship. Cynically, the policy practices, influenced by idealised, abstract notions of modernity thereby become a threat to the development trajectory of ongoing incremental development by farmers themselves.

## 2. Policy, interventions, and the quest for modernity

In this paper, we understand policy implementation as an interactive process, which can lead to a variety of outcomes as policy elites and implementers try to respond to societal actions and reactions (Thomas & Grindle, 1990, p. 1165). Policy is transformed and reinterpreted during the implementation process (Long, 2001a). Long and Van der Ploeg's actor-oriented approach (Long, 2001b; Long & Van der Ploeg, 1989) conceptualises planned intervention (a type of policy implementation) as an 'ongoing, socially-constructed and negotiated process' (Long & Van der Ploeg, 1989, p. 228) in which farmers and the state interact and strategise. The underlying understandings of 'modernisation' by the different actors have a marked influence on these dynamics (Li, 2007).

The concept of modernity was initially used by the nineteenth-century European scholars to understand the societal changes after the French and Industrial Revolution (Mahmoud, 2015; Wagner, 2014). An emphasis on rationality, alongside rapid technological advancement, led to technological optimism: the assumption that it would be possible to gather knowledge of both the physical and the social world and use that knowledge to control and improve the human condition (Kivisto, 2010). As such, modernity quickly became something other societies should aspire to. Europe was postulated as the modern 'winner' to emulate, while colonised peoples were the traditional 'losers'. The image of Africa (and other colonised regions) as traditional and underdeveloped was cemented in the modernisation theory that became popular among American scholars in the 1950s (Ekbladh, 2011; Gilman, 2004; Wagner, 2014). Replicating the idea that there are 'traditional' and 'modern' societies, modernisation theory assumed 'a common and essential pattern of "development", defined by progress in technology, military and bureaucratic institutions, and the political and social structure' (Gilman, 2004, p. 3). It was modernisation theory that drove the development projects that became so prevalent in the decades after African states reached independence. Scott (1998) captured the thinking behind these projects in the concept of 'authoritarian high modernist ideology': 'a strong, one might even say muscle-bound, version of the self-confidence about scientific and technical progress, the expansion of production, the growing satisfaction of human needs, the mastery of nature (including human nature), and, above all, the rational design of social order commensurate with the scientific understanding of natural laws' (p. 4). This ideology has created a situation in which technical experts hold a powerful position in defining both the problems and solutions for countries in the Global South, even if these are often contested at different levels (Ferguson, 1990; Li, 2007; Scott, 1998).

In the field of irrigation, modernisation interventions are often aimed at the introduction of new technologies and formal managerial systems in specific farmer-managed schemes by government or project engineers, supposedly to increase their efficiency and productivity (Burt, 2013; Plusquellec, 2009). In such an analysis, the 'aesthetics of modernity' (Scott, 1998, p. 185), or the appeal that modern symbolic objects and actions (such as water use permits, lined canals, or the presence of government engineers) have for their association with prosperity and success, are often ignored. In this article, we show that such symbols, and the effects these symbols have on people's sense of belonging to a certain group ('the moderns'), are crucial in giving meaning to interventions and are thereby a driving force for both farmers and engineers.



**Figure 1.** Location of the Mawala irrigation scheme in Kilimanjaro region, Kahe ward, Tanzania.

### 3. Methodology

This article is based on three months of fieldwork by the first author in the Mawala irrigation scheme in Kahe ward, Kilimanjaro region, in Northern Tanzania (Figure 1). The scheme has its origins in the early 1970s when farmers started making use of spring water that became available after an upstream estate failed (Rudengren, 1981). In the late 1990s, after digging and maintaining the canals communally for over 20 years, groups of farmers and village leaders requested government support for upgrading their infrastructure. As a result, several projects, including road rehabilitation and canal lining, have been implemented since 2005, with most projects taking place after 2010. In 2017, 11 canals were irrigating approximately 1300 hectares, making use of a formal water permit of 900 l/s.

The Mawala case was selected after it was identified by the Kilimanjaro Zonal Irrigation Unit as a successful demand-driven and participatory project. During an initial interview, one of the engineers described how improvement projects, executed in collaboration with the District Office, had been based on farmers' needs and priorities and how the design was once altered to match farmers' wishes.<sup>1</sup>

The fieldwork took place from November 2016 to January 2017. During this time, farmers and government prepared for another infrastructural project, giving the opportunity for observations during meetings and planning activities and for interviews about current and past irrigation development with the different actors involved. In the scheme, 10 canal leaders were interviewed, as well as five past and current irrigation cooperative leaders, and three construction committee members. In addition, 16 focus group discussions were held with male and female irrigators from eight different canals. All 11 secondary canals were mapped with a handheld GPS during walking interviews (Evans & Jones, 2011) with canal leaders, which gave further opportunities for observing and discussing the results from different infrastructural projects. To get an insight in the perspectives of different government officials, two village chairmen were interviewed, one village executive officer, one ward executive officer, and five irrigation engineers from Moshi Rural district office and the Kilimanjaro Zonal Irrigation Unit. The repeated contact with government officials, in combination with policy documents, lies at the basis for describing the government's position in these demand-

driven interventions. Finally, correspondence between farmers and different government offices was collected from the Zonal Irrigation Unit and the Pangani Basin Water Office. This correspondence was translated from Swahili to English where necessary. The correspondence was used to analyse how farmers (as a collective or as different groups) interacted with each other (meeting minutes, letters) and the government (letters and reports) and vice versa.

#### **4. The policy idea of demand-driven irrigation development**

Before turning to the analysis of implementation practices and the accompanying farmer-government dynamics in the case study area, we present an analysis of both the formal policy and its interpretation by government officials at the implementation level. We take a closer look at the national policies and guidelines for irrigation development, as well as the views of the engineers that are tasked with its implementation.

The mission of the Tanzanian irrigation policy is ‘to facilitate participatory demand-driven irrigation development’ (URT, 2010, p. 13). This emphasis on citizens’ participation is not new, as Tanzania has cast the village as the locus of development since independence, emphasising the role of villagers’ participation in the national development project (Green, 2010; Jennings, 2003). More recently, demand-driven approaches have taken hold, for instance in the field of water supply (Carlitz, 2017) and community development (Baird et al., 2013). In irrigation, this demand-driven approach is combined with a strong emphasis on ‘irrigation modernisation’ and ‘improvement’ of so-called ‘traditional infrastructure’ (URT, 2016b), which is often the result of farmer-led irrigation development. In addition, farmers’ organisations and institutions are replaced by or transformed into formal institutions that are tasked with scheme and project management. These elements combine into a policy of demand-driven irrigation improvement through infrastructural development and institutional formalisation, based on farmers’ demands and participation in the various stages of implementation. The expected outcomes of the improvements are better ‘water management, water use efficiency and crop yields’ (URT, 2016b, p. 8). This policy clearly reflects the desire for state control and the application of engineering knowledge that is such an integral part of modernisation ideals. With 79 per cent of the funds of the Tanzanian Agricultural Sector Development Programme (ASDP) going to irrigation over the period 2006–2013 (URT, 2006), and the irrigation development guidelines emphasising demand-driven and participatory approaches (URT/JICA, 2010), this policy can be expected to have a major impact on government interventions in the agricultural sector as a whole.

Many of the irrigation development targets have been expressed as the number of irrigated hectares to be added. The 2016 National Irrigation Development Strategy, for instance, aimed to expand the ‘developed area for irrigation’ to one million hectares by 2016 (URT, 2016b, p. 14). Although not explicitly mentioned, the ‘developed area for irrigation’ does not take into account irrigation initiated by farmers, which is considered ‘unproductive’ and ‘inefficient’ (ibid). The figure only includes government-initiated schemes and so-called ‘improved irrigation schemes’. The latter are ‘schemes originally initiated and operated by smallholder farmers that have received interventions by an external agency in the form of construction of a new diversion structure, gated canal intake, water division boxes and other farm related structures’ (URT, 2010, p. 15). This emphasis in the definition on structures, rather than on irrigation practices or productivity reflects some of the symbolism of modernity that is so strong in irrigation modernisation. In June 2008, less than 300,000 hectares were under ‘improved irrigated agriculture’ (ibid, p. 1). In the years that followed, the irrigated area was expanded by a maximum of about 20,000 hectares per year (URT, 2016b, p. 7). It is clear that the target of the Tanzanian government of irrigating one million hectares by 2016 has not been met, and will not be realised any time soon at the current pace, although the ambition for rapid irrigation expansion remains.

The demand-driven approach is operationalised in the 2010 ‘Comprehensive Guidelines for Irrigation Scheme Development under District Agricultural Development Plan’ (URT/JICA, 2010). These guidelines are supposed to drive the implementation of the National Irrigation Policy (URT, 2016a, 2016b) and include a scoring table meant to facilitate the identification of priority schemes

(URT/JICA, 2010, pp. 3–8). Most weight is given to farmers' motivation (30% of the total score, compared to 15% for the water source and 10% for market linkages), illustrating the conviction that irrigation development based on farmers' demands has the best chance to ensure 'optimal expansion of area under irrigated agriculture for smallholder farmers and enhancement of their sense of ownership' (URT, 2010, p. 19). The ideal scheme is one using gravity irrigation from a perennial river, with a potential area of more than 200 hectares, highly motivated farmers, good road and market linkages, and no anticipated land conflict.

In practice, the ZIU and district engineers use criteria for selecting a case that are very similar to those stated in the guidelines, though they do not explicitly refer to the written guidelines or policy. When asked how they select their project locations, they first of all state that it is their policy to line existing earthen irrigation canals, in order to reduce water losses through seepage. Secondly, a scheme has to have a registered irrigators association, and preferably a government-issued water use permit. Thirdly, it is good for a scheme to be a relatively large smallholder scheme, so 'the money can be felt by many'.<sup>2</sup> Fourthly, an area should not have conflicts, because 'it is not easy to take your money to the area where people are fighting every day'.<sup>3</sup> ZIU engineers 'try to have peaceful people, and understanding people, to work with'.<sup>4</sup> Finally, they prefer to go to places where 'the needs of the farmers [are] real'<sup>5</sup> and where farmers 'really want to irrigate'.<sup>6</sup>

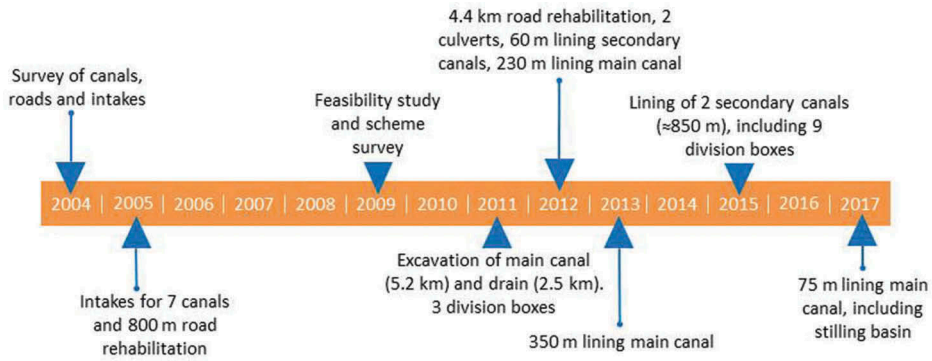
When assessing whether an intervention was a success, the engineers primarily refer to the process of intervention rather than the results. Firstly, they assume that if the allocation of funds and the design of the project are demand-driven, the implementation will automatically lead to an intervention that will meet farmers' needs. Secondly, the fact that higher levels of government and/or donors are satisfied is important. Performing the success of the intervention through emphasising the demand-driven and participatory character of the interventions is part of that, but so is meeting procedural requirements. Engineers are driven to spend their budget before the end of the financial year, lest they be considered lazy or ineffective: 'If government money was received three years ago, and it is still in the account, and you don't do anything ... If there is no reason, it can cost you your work, your employment'.<sup>7</sup> In the case of conditional funding, in which a certain amount of money has to be spent before the donor releases new money, project implementation can be rushed to free up new funds.

In short, state actors, both at the national and at the local level, adhere to the idea that demand-driven and participatory approaches lead to successful irrigation development. While the policy documents primarily focus on the expansion of the area under 'improved' irrigation and its related modernised agriculture, the implementing engineers are mainly concerned with meeting financial and construction targets and emphasise that farmers decide on what they want constructed. The ways in which farming and irrigation practices change, for instance through increased yield or water use efficiency, are central to the national policy but of less importance to implementing engineers. We will demonstrate this for the Mawala case in the following sections. We first describe and explain some of the crucial moments of government involvement in the scheme, and how it affected its functioning.

## 5. History of government involvement in the Mawala irrigation scheme

In this section, we briefly describe and analyse how the government's modernisation interventions, specifically demand-driven irrigation improvement projects, were adopted, transformed, or rejected by farmers over a period of about two decades (1995–2017).

Farmers of the Mawala irrigation scheme (covering Oria, Ngasinyi, and Mawala villages) first actively interacted with the state in 1995, when they applied for a water use permit of 0.9 m<sup>3</sup>/s. The permit was granted in 1996<sup>8</sup> and although framed as a farmer-initiated process by the basin water office, the account by farmers that they started the process after a government-initiated workshop seems more credible. In any case, it legitimised the scheme's claim to water. Moreover, the water permit also established the irrigation practices in the Mawala area as an 'irrigation scheme', as the

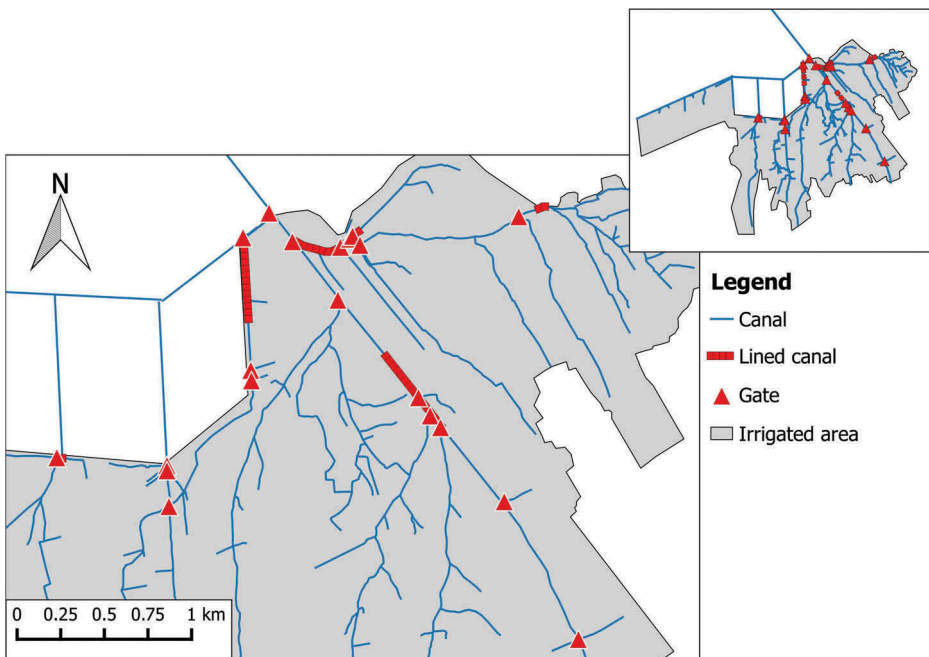


**Figure 2.** Timeline of infrastructural interventions and surveys in Mawala irrigation scheme.

permit recognised and formalised the irrigators, fields, and canals as a single unit. This status was reaffirmed through the surveys and infrastructural developments that followed.

After obtaining the water use permit, farmers started requesting infrastructural support from the government in 1997. Since that time, farmers have sent letters to the Regional Commissioner, District Commissioner, Zonal Irrigation Unit, and Pangani Basin Water Office requesting infrastructural support. At times the lobby was successful, which led to a variety of infrastructural interventions in the scheme (Figure 2).

The total estimated investment approaches 400,000 USD.<sup>9</sup> According to government statistics, the two latest projects led to 300 hectares of ‘improved traditional irrigation’, at a total cost of less than 200,000 USD. This means that the rehabilitation costs were about 600 USD per hectare, a limited amount in comparison to the average costs of 5–8,000 USD, as calculated by Inocencio et al. (2007) for 19 irrigation rehabilitation projects in Africa. The low spending corresponds with the limited



**Figure 3.** Location and extent of lined canals and constructed division boxes in the Mawala scheme.



nature of the project, which only focused on lining secondary canals and cementing division boxes, rather than addressing infrastructure from intake to field level. Farmers' dissatisfaction with the limited scope of the rehabilitation was exacerbated by the fact that recently renovated pieces of canal were already in disrepair, most infrastructural projects took place in the headend of the scheme,<sup>10</sup> and less than 5 per cent of the secondary canals was lined (Figure 3).

In 2004, as part of the infrastructural improvement process, the government encouraged farmers to register an irrigation cooperative to formalise their previous system of canal leaders. After several trainings, the opening of a bank account and the completion of a constitution, the Ongama irrigation cooperative was registered in 2007. It is interesting to note that, like with the water use permit application, the government's files portray the process as driven by farmers, while farmers explicitly say and write that the government initiated it. Reconstructing events based on the ZIU files shows that the initial meeting to start a cooperative was in fact initiated by the government, as were the trainings in which the founding members participated afterwards. This makes the farmers' account again more credible.

Through getting a water use permit, collaborating with the government in infrastructural projects and formally registering the irrigation cooperative, the Mawala farmers have become increasingly eligible for government support. This process is framed by the government as farmer-driven, but although farmers have not resisted institutional formalisation, they were also not the ones instigating it. Furthermore, the irrigation cooperative does not function as envisioned by the Pangani Basin Water Board: it struggles to collect fees, has failed to pay for the water use permit, and has not managed to independently mediate in conflicts with the upstream sugar estate. Instead, it has primarily become a conduit for communication between farmers and the government in the case of infrastructural projects.

In the next sections, we elaborate on why and how farmers have been working together with the government, and how a shared vision of modernisation has led to farmers disciplining themselves to match the government's notions of development.

## **6. The symbolism of irrigation modernisation**

At the heart of farmers' interest in working together with government are their expectations about modernisation and development. Farmers' general assumption is that if they can get 'truly modern canals', it will resolve water shortages and reduce the need for cleaning, resulting in productive and efficient agriculture and overall development. These expectations are summarized by a man farming along one of the lined canals: 'We expected that water would run and that [farmers] would get a lot of water, and everything [would] be easy, and everybody [would] be happy'.<sup>11</sup>

However, it has become clear that the lining of canals has not led to these expected results. Farmers state that water has actually reduced, that its division is more inequitable and that they have not seen an increase in yield. The most positive aspect of the lining is that the canals do not need to be cleaned or rebuilt, reducing labour requirements for those sections of canal. In spite of this, almost all canal leaders, when asked, say that if they were in charge, their first decision would be to line their canal. This discrepancy is explained by the fact that farmers believe that the canals that are being lined in Mawala are not 'truly modern': 'They are building a drain, following the canals our grandparents dug those years. When we get modern canals, then that could help us'.<sup>12</sup> In other words, what the government has done so far does not match the image farmers have of modern canals: the technology that will finally alleviate water shortage and bring development and productive agriculture. In spite of the results of previous projects, they still believe that the lining of canals, if done in the right way, can fulfil this desire.

In an attempt to overcome the apparent contradiction between expectations and results, farmers put the blame on the designs and engineers: 'They built it in a wrong way. If experts would be there, the canal would not be built like that. Real engineers never came to build the canals, they [the government] just brought cheap engineers'.<sup>13</sup> Part of these complaints about the engineers is

due to the substandard work on some of the canals, causing the canal walls to fall down or the cement to crack within a few years or even months. However, many farmers are also displeased with the appearance of the engineers and how they worked: 'Really, the engineers are a challenge. They have no tools; they are even asking farmers for hoes and shovels'.<sup>14</sup> Other farmers referred to how the engineer ate the same food as everybody else, took a motorbike taxi to the site and transported materials by donkey cart. In these statements, there is a certain disillusionment with the engineers, who are not the 'experts' the farmers were expecting, coming to bring development carrying the symbols of modernity: vehicles, power tools, and excavators. Instead, they use the same tools as the village craftsmen to build canals that look a lot like canals farmers could have built themselves.

Just as with the engineers, the canals' appearance plays as big a role as their performance in discussions about what modern irrigation should look like. Besides stating the importance of timely and sufficient water delivery, farmers regularly refer to neighbouring schemes as having the real modern canals. Especially the Lower Moshi Irrigation Scheme, which was once considered as a model for modern irrigation schemes in Tanzania (URT/Nippon Koei, 2002), is frequently mentioned. Lower Moshi is a rice scheme designed and built with support from the Japanese government, with concrete canals and division boxes, standard and levelled plots, and a strict planting schedule. Contrary to Mawala, where the canals have a rectangular cross-section, the Lower Moshi canals are trapezoidal. When farmers travel from their village to Moshi town, they pass through this system. They repeatedly explain how their canals look different from those in Lower Moshi and wonder why that is

'They built ours like a house, what kind of canal is that? Water is not going, crops are dying. Those canals of [the cooperative of Lower Moshi], even if you are far, in the car, in the minibus, you can see how nice and attractive they are, not like a house like ours'.<sup>15</sup>

The 'house' the farmer is mentioning, is a reference to the canals of Mawala which have a rectangular cross-section (the sides being built with the same building blocks houses are made of), while those in Lower Moshi have trapezoidal cross-sections made of reinforced cast concrete. With Lower Moshi being a model modern scheme for both farmers and the government, farmers wonder why their canals do not look the same<sup>16</sup> and feel like they are being cheated.

Farmers' modernisation aspirations and narratives push them to actively look for government support to line their canals, in spite of disappointing results after previous infrastructural projects. The powerful symbols of modern canals with trapezoidal cross-section and engineers with construction machinery prevail and cause farmers to believe that if the right designs and the right engineers can be sent, water shortage will be reduced and agriculture will be productive. This belief in external expertise is accompanied by a retreat of farmers' involvement in developing infrastructure, which is also part of a strategy to be seen by the government as a grateful community, as we elaborate upon below.

## **7. Self-disciplining and portraying a peaceful image**

In order to be eligible for government recognition and funding, farmers have applied for a water use permit and registered an irrigation cooperative, both after encouragement by government officials. Especially the water use permit is a shared symbol of modernity and legitimacy for farmers and the government: both repeatedly mention it during discussions about water availability and see the moment the permit got issued as the moment the scheme truly came into being. In addition to the formalisation efforts, irrigation and village leaders have tried to cultivate good relationships with the government officials they are directly dependent on. A group of Mawala village elders explained the importance of this in a letter written after a conflict among farmers, advising that

‘[farmers] respect and use government funds for their intended purpose, so the government thinks we have used it well without conflict and will continue to find us other money and finally judge us to be an excellent example of development and a role model for others’.

This thought process is at the root of farmers’ self-disciplining through which dissent and dissatisfaction are hidden in order to portray the image of a peaceful and grateful community. This is achieved through three main strategies, which are sometimes employed at the same time.

First, dissatisfaction with the results of infrastructural projects, such as frequently expressed by farmers during interviews and focus groups, is absent from the formal, written communication between farmers and the government. In the letters, irrigation and village leaders defer to the engineers as the true authority in the field of irrigation development, relegating farmers to a supporting role. An example of this strategy, and of its necessity, was the events surrounding the 2011 infrastructural works. When the farmers’ construction committee wrote to the supervising engineer that the dimensions of the designed canal were too small to carry floods and should, therefore, be enlarged, the ZIU agreed, adjusted the design, and widened the canal. However agreeable this situation seems, the engineers wrote in their report of late March 2011 that ‘the construction committee first wanted to spoil the relationships by wanting to perform roles which certainly were not theirs’ and that ‘the construction committee, being insecure about the work they were overseeing and their daily activities, even [wanted] to play the role of experts’. Here, they were undoubtedly referring to the committee’s interference in the design and implementation process. On 18 March 2011, the Ongama cooperative suspended the construction committee for stealing fuel from the construction site. The chairman of the 2011 construction committee admitted that he was taken to court, but says that he was cleared of all charges,<sup>17</sup> and he was re-elected as construction committee chairman in 2016. This indicates that the suspension of the committee was possibly a tool to appease the engineers, rather than the result of real concerns about its members’ functioning.

The most explicit expression of leaders handing over responsibility for irrigation development to the government’s experts was possibly when farmers were told by their representatives not to build irrigation structures because this was seen as a government task. Although farmers themselves have in the past constructed a few permanent concrete structures such as an intake, a division wall, and a culvert carrying water over another canal, this has increasingly been blocked by the scheme management. In a 2005 letter to a farmer wanting to build a division box, the then active water user association stated that

‘The [ZIU] is the only one to supervise the primary building or any repairs when it is needed, not anyone else. So it is better you stop and you break down whatever you have built, because that [what you have done] is like destroying the whole structure of the scheme. Also, this project belongs to the government, so you should not control it like personal property’.

Similarly, the irrigation cooperative leading the scheme told a canal leader in 2015 not to reconstruct the canal intake, although irrigators had already collected money. Again the reason given was that infrastructural development is the work of the government. Finally, in March 2019, during the recording of video material for a short documentary, a leading farmer refused to talk about farmers’ own construction projects in the scheme, because he did not want to offend the government.

In a second strategy, the image of a grateful and peaceful community is promoted by discrediting those who raise concerns as being external, unknowing, or troublemakers. One example of this was the abovementioned firing of the construction committee after they offended the engineers, but there are more instances where this strategy was employed. When a group of 82 farmers wrote to the district commissioner to complain about the implementation of a project, it led to a response from the ward executive officer, discrediting the complainants. One of his main arguments was that these farmers were not part of the scheme and did not know what was going on, because they rented land rather than owning it. While this may be true for some, others on the list of signees did own land and at least one was involved in the application of the first water right in 1995. After reducing the complainants to a small group of

external farmers, the ward executive officer asked for security and anticorruption officials to identify those few who were holding back the ‘development of the nation’. He also stated that

to continue the model of fighting against experts, leaders and officers of the central government is unlucky for future development’. [Mawala should] ‘have a culture of loving, and receiving advice from, leaders, experts and officers of the village, kaya,<sup>18</sup> district and central government.

This final statement, besides putting aside the farmers as the enemies of development, also again reflects the deference to the government experts. In assessing the validity of the ward executive officer’s statements, it is interesting to note that one of the farmers being accused of being external later became the secretary of the irrigation cooperative and is the son of one of the first leaders in the scheme. These statements, therefore, seem again to be more of a discursive tool than a realistic explanation for the reported issues.

Finally, while projects might not lead to actual improvements in irrigation practices or productivity for farmers, farmers are reluctant to reject any offered support. This is due to the persistence of modernisation narratives, as explained in the previous section, but also because continuous contact and shared activities with the government are seen as a security for the future. In addition, it might have add-on benefits that are not related to irrigation, as explained by one farmer:

The place with no government is dead. The role of farmers is to be close with the government, to cooperate with the government. (...) For instance, when there is a conflict, it is easy for the government to solve it. Or if we need something, it is easier for the government to solve it.<sup>19</sup>

The reluctance to reject a project, even if it is not considered to match the priorities of farmers, became clear in 2014. Initially, farmers agreed on lining secondary canals, but in later meetings this was changed to requesting the secondary canals to be lifted, thereby solving problems caused by the sub-field level of existing canals. The ZIU rejected this idea, however, saying that the money was insufficient for such a project. When it became clear that what farmers truly wanted was not possible, the chairman of Ngasinyi village captured the dilemma best: ‘you need to decide whether to receive this little bit or not to receive it. If we refuse, we will be removed from the list of the needy’. In the end, two canals were lined in their original low-lying position.

Farmers in Mawala share a vision of modernity and development with the state engineers, although they interpret elements of it differently. In order to secure future projects, farmers portray a peaceful and grateful image, even when there are internal conflicts or protests about irrigation project implementation. In addition, farmers never reject a project, even when they do not think that the benefits will outweigh the costs. These strategies speak of farmers’ strength and insight in the project allocation process on the one hand, but also indicate a power imbalance which problematises the characterisation by the zonal irrigation engineers of Mawala as being a successful participatory project in which farmers are in control.

## **8. Conclusion**

The Mawala case shows how shared modernisation ideals drive both farmers and government officials in their wish for state interventions in farmer-led irrigation development. From policymakers to engineers to farmers, all subscribe to a similar idea of modernisation in which a strong state presence, institutional formalisation, and engineering transform a ‘messy’ farmer-initiated irrigation scheme into a well-managed, efficient, and productive agricultural system through planned intervention.

However, the influence of the everyday politics and concerns of implementing engineers translate the demand-driven participatory approach from a means to achieve more sustainable results through securing the cooperation of motivated farmers into a project objective in its own right. Engineers use

participatory and demand-driven approaches to justify projects which have little impact on irrigation practices or water availability, with the argument that they are simply following farmers' instructions. Meanwhile, procedural constraints and the fear of being seen as ineffective by superiors drive the implementation of projects even when there are doubts about their contribution to improving agricultural productivity.

At the same time, farmers' steadfast belief in modernisation as something brought by external actors and the power they attribute to the aesthetics of modernity severely impact their interactions with government officials and their understanding of good irrigation. This is illustrated by the Mawala case, where farmers want their scheme to look similar to the neighbouring Japanese engineered scheme, which has become a model for modern irrigation for both the government and farmers. In a similar way, engineers are expected to be accompanied by modern attributes such as vehicles and tools and to be visibly different from villagers in behaviour, in order to truly embody the external expert. Farmers' conviction that the right engineers and the right canals have not yet been brought to Mawala explains why farmers strategise to make sure that the state will continue to choose Mawala as a site for intervention. Irrigation and village leaders do this by strategically portraying a positive image towards the government, of an eager, collaborative, and unified community. They downplay dissent, suppress farmers' construction initiatives, and defer to engineers as the only and true experts of irrigation development, thereby undermining the farmer-led irrigation development processes that were once at the heart of the scheme. Finally, every infrastructural project and every institutional formalisation attempt are accepted, even if the majority of farmers does not think that that particular intervention will ease their water management burden or increase their production. The engineering and institutional formalisation projects have come to symbolise a productive relationship with the government, as well as a way to achieve development and modernity.

The combined ideas of modernity of farmers and government engineers mean that the practices of the policy do not lead to the transformations desired by the state or farmers. Instead, the policy practices lead to symbolic modernisation, which cements the role between farmers and state, but does not increase water use efficiency or agricultural productivity. In fact, the interventions have stopped farmers from further investing in irrigation development. Instead, the idea that only external expertise can lead to modernisation has won from the confidence that it is worthwhile for farmers to continue driving their own development.

As observed in the policy practices at the Mawala irrigation scheme, symbolic modernisation has several functions, even if it does not directly impact productivity or efficiency. In the first place, it offers implementing engineers the opportunity to reach its spending targets and an apology for making poor engineering decisions. Secondly, it offers the state a relatively easy way to add to its counted irrigated area. Thirdly, it offers farmers a possibility to get their practices formally recognised by the state. And finally, it reinforces farmers' hope of external salvation. What symbolic modernisation does not do is help farmers in taking next steps in their self-initiated development trajectory. By reinforcing farmers' hope in external salvation, symbolic modernisation even risks that demand-driven irrigation policies become an obstacle to farmers' ownership of irrigation development by obstructing rather than supporting further agricultural intensification and commercialisation.

As ongoing processes of farmer-led irrigation throughout SSA show, the effectiveness of irrigated agriculture does not depend on high-tech infrastructure and formalised institutional models (Veldwisch et al., 2019). However, it appears to be very difficult to avoid the influence of the omnipresent strong belief in a type of modernisation which is state-initiated and -controlled and relegates farmers to mere recipients of technology and formalised institutions. In interaction with external engineers, this belief is reinforced and farmers risk losing ownership over their historic development trajectories. In other words, state intervention in farmer-led irrigation development processes can ultimately lead to the destruction of farmers' initiatives, and the processes that were meant to be supported can instead be halted. It requires good engineering knowledge and careful facilitation to help farmers analyse their irrigation practices and the possibilities to improve on them. Creating a framework in which this can be done will be the next big

challenge for those governments and development practitioners wishing to engage with farmers' irrigation initiatives.

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## Notes

1. Interview Principal Engineer, Zonal Irrigation Unit, 6 January 2016.
2. Interview Zonal Irrigation Engineer, 12 December 2017, Moshi.
3. Interview Agronomist, Zonal Irrigation Unit, 12 December 2017, Moshi.
4. Interview Zonal Irrigation Engineer, 6 February 2017, Moshi.
5. Interview Principal Engineer, Zonal Irrigation Unit, 6 January 2016, Moshi.
6. Interview Principal Engineer, Zonal Irrigation Unit, 6 January 2016, Moshi.
7. Interview District Irrigation Engineer, 20 January 2017, Moshi.
8. Provisional Grant of a water right, water right no. 140126. Issued on 1 March 1996, Moshi.
9. Based on different allocations of money since 2004, as tracked through correspondence and project reports obtained from the ZIU office. The amounts in Tanzanian Shillings were converted to United States Dollars at the exchange rate for the year the money was allocated.
10. The concentration of activities in one part of the scheme is in line with what we observed in power differences between different areas in the scheme. In addition, tribalism and inequalities in water access were mentioned by water users between head- and tail-enders. Although we acknowledge this differentiation within the community, its analysis is not at the core of this paper, which instead focusses on showing how farmers from within the scheme interact as a group with external government actors.
11. Male farmer Mapinduzi canal during focus group, 10 January 2017.
12. Male farmer Samachi A canal during focus group, 24 January 2017.
13. Female farmer Bomba tatu canal during focus group, 27 January 2017.
14. Male farmer Chamkea canal during focus group, 12 January 2017.
15. Male farmer Bomba tatu canal during focus group, 27 January 2017.
16. The Zonal Irrigation Engineer argued that the difference in design is explained by the fact that in Mawala concrete canals are built inside existing earthen canals. To be able to build a trapezoidal canal, the earthen canal would first have to be filled and then excavated again in the desired shape. The rectangular canal can be built directly into the existing canal, and is, therefore, easier to construct and cheaper.
17. Interview 2011 construction committee chairman, 8 February 2017.
18. Kaya can literally be translated to 'household', but in this case refers to the term used during the Ujamaa/African Socialism villagisation programme where it meant a group of 250 households within one village (Lal, 2015).
19. Female farmer Mapinduzi during focus group, 10 January 2017.

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## References

- AGRA. (2018). *What is farmer-led irrigation? Unlocking innovation for livelihood, food, and water security*. Retrieved February 27, 2019, from [www.agra.org/what-is-farmer-led-irrigation-unlocking-innovation-for-livelihood-food-and-water-security/](http://www.agra.org/what-is-farmer-led-irrigation-unlocking-innovation-for-livelihood-food-and-water-security/)
- AU-SAFGRAD. (2018). *Continental Irrigation and Agricultural Water Development Framework - Draft*. Ouagadougou, Burkina Faso: Unpublished.
- Baird, S., McIntosh, C., & Özler, B. (2013). The regressive demands of demand-driven development. *Journal of Public Economics*, 106, 27–41.
- Beekman, W., Veldwisch, G. J., & Bolding, A. (2014). Identifying the potential for irrigation development in Mozambique: Capitalizing on the drivers behind farmer-led irrigation expansion. *Physics and Chemistry of the Earth, Parts A/B/C*, 76–78, 54–63.
- Boelens, R. (2008). *The rules of the game and the game of the rules - normalization and resistance in Andean water control* (Doctoral Dissertation). Retrieved from <https://edepot.wur.nl>
- Burt, C. M. (2013). The irrigation sector shift from construction to modernization: What is required for success? *Irrigation and Drainage*, 62, 247–254.
- Carlitz, R. D. (2017). Money flows, water trickles: Understanding patterns of decentralized water provision in Tanzania. *World Development*, 93, 16–30.
- Cooke, B., & Kothari, U. (Eds.). (2001). *Participation: The new tyranny?* London, UK: Zed Books.
- Craig, D., & Porter, D. (1997). Framing participation: Development projects, professionals, and organisations. *Development in Practice*, 7, 229–236.
- de Bont, C. (2018a). *Modernisation and farmer-led irrigation development in Africa: A study of state-farmer interactions in Tanzania* (Doctoral Dissertation). Retrieved from <https://su.diva-portal.org>
- de Bont, C. (2018b). The continuous quest for control by african irrigation planners in the face of farmer-led irrigation development: The case of the Lower Moshi Area, Tanzania (1935-2017). *Water Alternatives*, 11, 893–915.
- de Bont, C., Komakech, H. C., & Veldwisch, G. J. (2019). Neither modern nor traditional: Farmer-led irrigation development in Kilimanjaro Region, Tanzania. *World Development*, 116, 15–27.
- de Bont, C., Liebrand, J., Veldwisch, G. J., & Woodhouse, P. (2019). Modernisation and African farmer-led irrigation development: Ideology, policies and practices. *Water Alternatives*, 12, 107–128.
- Ekbladh, D. (2011). Introduction. In *The great American mission: Modernization and the construction of an American world order* (pp. 1–13). Princeton, NJ: Princeton University Press.
- Evans, J., & Jones, P. (2011). The walking interview: Methodology, mobility and place. *Applied Geography*, 31, 849–858.
- Ferguson, J. (1990). *The anti-politics machine: "Development," depoliticization, and bureaucratic power in Lesotho*. Cambridge, MA: Cambridge University Press.
- Gilman, N. (2004). Modernization theory and American modernism. In *Mandarins of the future: Modernization theory in Cold War America* (pp. 1–23). Baltimore, MD: Johns Hopkins University Press.
- Green, M. (2010). Making development agents: Participation as boundary object in international development. *Journal of Development Studies*, 46, 1240–1263.
- Inocencio, A., Kikuchi, M., Tonosaki, M., Maruyama, A., Merrey, D., Sally, H., & de Jong, I. (2007). *Costs and performance of irrigation projects: A comparison of sub-saharan africa and other developing regions* (Research Report No. 109). Colombo, Sri Lanka: International Water Management Institute
- IWMI. (2016). *Irrigated Africa and Asia*. Retrieved January 17, 2019, from [www.iwmi.cgiar.org/2016/02/irrigated-africa-and-asia/](http://www.iwmi.cgiar.org/2016/02/irrigated-africa-and-asia/)
- Jennings, M. (2003). "We must run while others walk": Popular participation and development crisis in Tanzania, 1961-9. *The Journal of Modern African Studies*, 41, 163–187.
- Kivisto, P. (2010). Modernity. In *Key ideas in sociology* (pp. 131–167). London, UK: SAGE Publications.
- Lal, P. (2015). *African socialism in postcolonial Tanzania: Between the village and the world*. New York, NY: Cambridge University Press.
- Lefore, N., Giordano, M., Ringler, C., & Barron, J. (2019). Viewpoint – Sustainable and equitable growth in farmer-led irrigation in Sub-Saharan Africa: What will it take? *Water Alternatives*, 12, 156–168.
- Li, T. M. (2007). *The will to improve: Governmentality, development and the practice of politics*. Durham and London, UK: Duke University Press.
- Long, N. (2001a). Demythologising planned intervention. In *Development sociology: Actor perspectives* (pp. 30–48). London, UK: Routledge.
- Long, N. (2001b). The case for an actor-oriented sociology of development. In *Development sociology: Actor perspectives* (pp. 9–29). London, UK: Routledge.
- Long, N., & Van der Ploeg, J. D. (1989). Demythologizing planned intervention: An actor perspective. *Sociologia Ruralis*, 29, 226–249.
- Mahmoud, Y. (2015). Modernization, development studies and modernity in current African debates. In A. C. Lindgren & S. Ross (Eds.), *The modernist world* (pp. 155–163). London, UK: Routledge.
- Mansuri, G., & Rao, V. (2004). Community-based and -driven development: A critical review. *The World Bank Research Observer*, 19, 1–39.

- Mdee, A., & Harrison, E. (2019). Critical governance problems for farmer-led irrigation: Isomorphic mimicry and capability traps. *Water Alternatives*, 12, 30–45.
- Mosse, D. (2004). Is Good Policy Unimplementable? Reflections on the ethnography of aid policy and practice. *Development and Change*, 35, 639–671.
- Plusquellec, H. (2009). Modernization of large-scale irrigation systems: Is it an achievable objective or a lost cause. *Irrigation and Drainage*, 58, S104–S120.
- RoG. (2011). *National irrigation policy, strategies and regulatory measures*. Accra, Ghana: Ghana Irrigation Development Authority.
- RoK. (2015). *Draft national irrigation policy, 2015*. Nairobi, Kenya: Kenyan Ministry of Agriculture, Livestock and Fisheries.
- RoU. (2011). *A national irrigation master plan for Uganda (2010-1035)*. Kampala, Uganda: Ministry of Water and Environment.
- Rudengren, J. (1981). *Peasants by preference? Socio-economic and environmental aspects of rural development in Tanzania* (Doctoral dissertation). Retrieved from <https://www.hhs.se/en/library/sse-publications/dissertations-fulltext/>
- Scoones, I., Murimbarimba, F., & Mahenehene, J. (2019). Irrigating Zimbabwe after land reform: The potential of farmer-led systems. *Water Alternatives*, 12, 88–106.
- Scott, J. C. (1998). *Seeing like a state - How certain schemes to improve the human condition have failed*. New Haven. London, UK: Yale University Press.
- Thomas, J. W., & Grindle, M. S. (1990). After the decision: Reforms implementing policy in developing countries. *World Development*, 18, 1163–1181.
- URT. (2006). *Agricultural sector development programme*. Dar es Salaam, Tanzania: Ministry of Agriculture, Food and Cooperatives.
- URT. (2010). *The national irrigation policy*. Dar es Salaam, Tanzania: Ministry of Water and Irrigation, United Republic of Tanzania.
- URT. (2016a). *Agricultural sector development programme phase 2*. Dar es Salaam, Tanzania: Ministry of Agriculture, Livestock and Fisheries.
- URT. (2016b). *National irrigation development strategy - Final draft*. Dar es Salaam, Tanzania: Ministry of Water and Irrigation, United Republic of Tanzania.
- URT/JICA. (2010). *The comprehensive guidelines for irrigation scheme development under district agricultural development plan*. Dar es Salaam, Tanzania: Ministry of Water and Irrigation.
- URT/Nippon Koei. (2002). *The study on the national irrigation master plan in the United Republic of Tanzania: Master plan, main report*. Dar es Salaam, Tanzania: JICA/Ministry of Agriculture and Food Security.
- Veldwisch, G. J., Venot, J.-P., Woodhouse, P., Komakech, H. C., & Brockington, D. (2019). Re-introducing politics in African farmer-led irrigation development: Introduction to a special issue. *Water Alternatives*, 12, 1–12.
- Wagner, P. (2014). Europe and the sociology of modernity. In S. Koniordos & -A.-A. Kyrtis (Eds.), *Routledge handbook of european sociology* (pp. 127–140). New York, NY: Routledge.
- Woodhouse, P., Veldwisch, G. J., Venot, J.-P., Brockington, D., Komakech, H., & Manjichi, A. (2017). African farmer-led irrigation development: Re-framing agricultural policy and investment? *The Journal of Peasant Studies*, 44, 213–233.
- World Bank. (2018). Innovation, entrepreneurship, positive change. Join the farmer-led irrigation revolution. Retrieved February 27, 2019, from [www.worldbank.org/en/news/feature/2018/09/05/innovation-entrepreneurship-positive-change-join-the-farmer-led-irrigation-revolution](http://www.worldbank.org/en/news/feature/2018/09/05/innovation-entrepreneurship-positive-change-join-the-farmer-led-irrigation-revolution)