

# 8

## AGRICULTURAL WATER MANAGEMENT IN MATRILINEAL SOCIETIES IN MALAWI

Land ownership and implications for  
collective action

*Everisto Mapedza, Emelder M. Tagutanazvo, Barbara van  
Koppen and Christopher Manyamba*

### Introduction

Collective action is a central pillar for enabling effective joint use and management of land and water for improved rural livelihoods in Malawi. This chapter analyses how the passing of land inheritance in a matrilineal society could manifest in collective action centred on the shaping of Water User Associations (WUAs) as a new arena for a gendered power contestation. Contextualized in an irrigation scheme, which initially began as informal irrigation but was later transformed into a formal irrigation scheme as it expanded within the matrilineal society of the Ntcheu District of Malawi, the chapter looks at the issue of power dynamics and how it plays out within irrigated agriculture. One of the major findings is that while landownership might be perceived as an important step for accumulating power within matrilineal societies, it does not automatically translate into more power within the WUA arena due to underlying structural or cultural barriers, which make it more difficult for women to engage within the public sphere. While the findings indicate that it is possible to have access to land resources without having meaningful control over the produce from irrigated agriculture or meaningful engagement in WUAs, it also shows how the mere introduction of irrigation which enables winter cropping introduces new gendered power dynamics. A better understanding of such gender dynamics will inform collective action within irrigated agriculture.

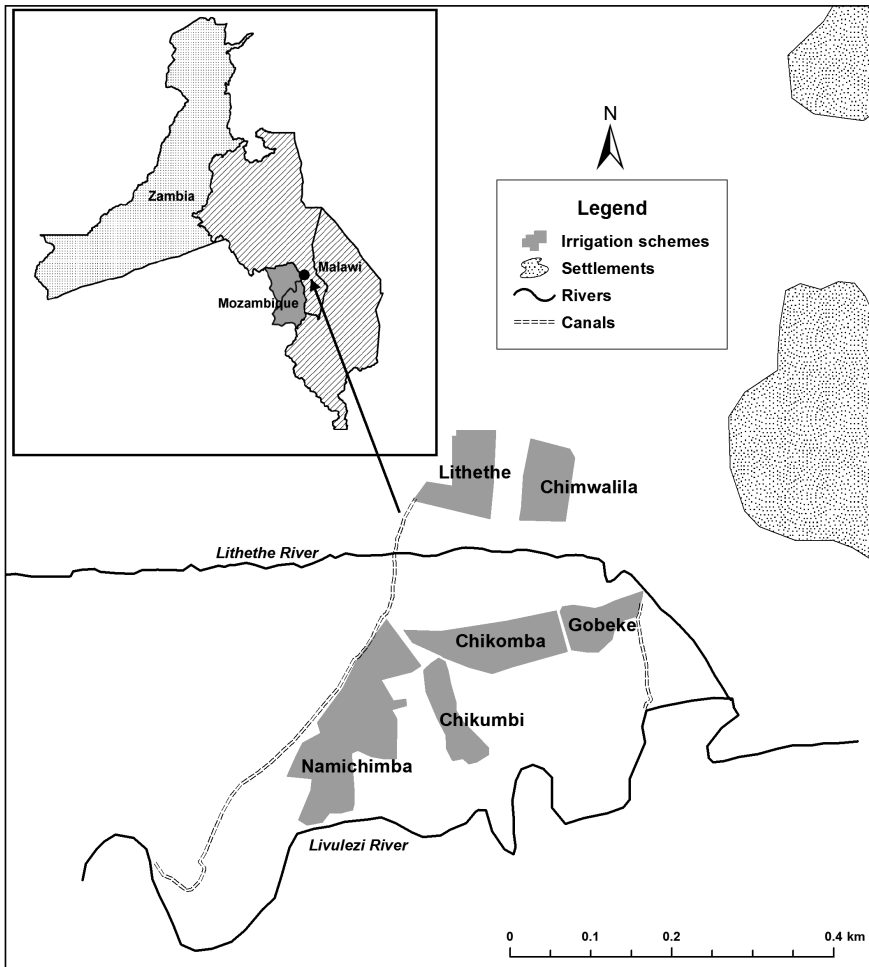
Land and water resources management has often been perceived through the lens of the tragedy of the commons (Hardin, 1968; Quiggin, 1993). While Hardin's arguments have often been used to justify the need for state intervention to 'save' natural resources from the hands of destructive users, another strand of scholars have felt that his scholarship conveniently lumps common property resources together with open access resources in his 'tragedy of the commons'

thesis (Ostrom, 1990, 1992, 1993, 1999, 2009; Stern et al., 2002; Bromley and Cernia, 1989; Bromley 1991; Berkes and Farvar, 1989, Jodha, 1992; Runge, 1992; Murphree, 1991, 1994; Wily, 2000; Meinzen-Dick, 2014; Chikozho and Mapedza, forthcoming). This chapter looks at how collective action plays out within the Malawi landscape of Ntcheu District. The authors argue that while it is important to understand collective action, it is also important to ground such an understanding within the gendered lens, especially in the context of a matrilineal context where it is often assumed that women have more leverage due to the matri-local (*chikamwini*) nature of marriages in the Ntcheu area.

One of the key thrusts of the commons scholarship has been to discredit Hardin's thesis. However, in that scholarship endeavour, gender, and how it is a key factor in the engagement of collective action, has largely lagged behind (Meinzen-Dick et al., 2000; Pandolfelli et al., 2008; Zwarteveen, 1997, 1998; Zwarteveen and Meinzen-Dick, 2001; Shah et al., 2002). This chapter looks at how gender was a major factor in determining the engagement of women in the WUA, despite women nominally owning land within the matrilineal setting of Malawi. Ownership has to be viewed within the context of the bundle of rights that other people have over the same property (Fortmann, 1995).

## Study area

The study focuses on the Kaziputa irrigation scheme, located in Kandeu, Ntcheu District, in the south-central region of Malawi, within the confines of the Chinyanja Triangle, which borders Mozambique to the west, Dedza District to the north, Neno District to the south, Balaka District to the southeast, and Mangochi District to the northeast (see Figure 8.1). The 8.53-hectare irrigation scheme began in 2005. It operates mainly as a self-funded community-owned project, currently comprising 75 irrigators whose principal source of livelihood is agriculture, specializing mainly in cereal production, particularly maize. Due to climate variability, rain-fed agriculture is increasingly facing major challenges. Each of the smallholder farmers, on average, cultivate less than 0.1 hectares of land. Ntcheu District covers 3,424 square kilometres of land and holds a total of 474,464 people, of whom 226,567 are male while 247,897 are female. The Ntcheu area has also seen a large proportion of men leaving to work in the South African mines since as far back as the 1920s, under a bilateral labour contract between Malawi and South Africa (International Organization for Migration, 2015). The area in which the scheme is located is considered the least irrigated in Southern Africa, despite its aridness, which is compounded by the prevalence of slightly above-average temperatures, which mostly range from a minimum of 13 degrees Celsius to a maximum of 31 degrees Celsius. Rainfall is very unreliable, but can be up to 1200 millimetres per year. The scheme draws its water uphill from the Livulezi River, via a gravity-fed system that utilizes canals as water channelling mechanisms to the irrigated plots.



**FIGURE 8.1** Map of the Kaziputa irrigation scheme, Kandeu, Ntcheu District  
 Source: Luxon Nhamo, IWMI Pretoria Office, South Africa

### Situating gender within landownership in Ntcheu

Ntcheu District is a largely matrilineal society where landownership is passed through the female line, from mothers to daughters. It is also largely matri-local, meaning that when a man and woman get married, the husband has to move to the wife’s homestead to begin their family there. In most rural settings, agriculture is the main source of livelihoods. This means that agricultural production will be on the wife’s land, which will have passed to her from her mother. Within matrilineal and matri-local societies, husbands own hardly any land. The village head reported, ‘Ownership depends more on women. Men don’t have much power. We can leave and go to stay somewhere else’ (interview, 23 July 2014). In the

**TABLE 8.1** Marital status of head of household

	<i>Irrigating</i>		<i>Non-irrigating</i>		<i>Total</i>	
	Number	%	Number	%	Number	%
Married	59	44.0	42	31.3	101	75.4
Divorced	7	5.2	8	6.0	15	11.2
Widowed	8	6.0	10	7.5	18	13.4
Total	74	55.2	60	44.8	134	100.0

Source: Authors' field work

event of divorce, the husband will leave his children and wife and will usually take only a few assets with him. In the study area, divorced men usually took only a bicycle and a blanket, leaving all other assets with their ex-wives and children. This narrative portrays wives as being more powerful than and having leverage over their husbands. Although this may lead to expectations that divorce rates would be high (as women can easily chase away their husbands and retain their assets), this is not the case in reality. Table 8.1 shows the marital status of the case study households. Divorce rates stood at only 5.2 percent for households involved in irrigation and only 6 per cent for non-irrigators.

Our research found that in matrilineal societies, relationships between husbands and wives are extremely nuanced and, we argue, display differential power dynamics between women and men in a number of ways. While, traditionally, the land is transferred to the women, husbands have joint decision-making when it comes to issues of labour, inputs, marketing and control of the benefits from irrigated agriculture (see also Kabeer, 1991). Agrawal (1994) points out that it is not just the ownership of property that determines someone's relative power, but the degree of control over that property.

First, landownership is vested in the woman and passes from mother to daughter. However, when it comes to decisions on the utilization, leasing or disposal of land, women are not the major decision-makers. In Ntcheu, uncles are central in decisions on how land is disposed of, not husbands, who have no control over landownership and its transfer. While nominally the land is vested in the woman's name, the control and major decisions pertaining to that land are made and effected by her uncles. Table 8.2 shows landownership and control of income based on our survey.

Second, labour provision is a key means for husbands to justify their presence and role in agricultural production in matrilineal lands. In the study area, it was often pointed out that husbands who could not provide labour would often be asked by their wives' uncles why they were not producing enough food to support their families. However, husbands do provide a great deal of labour, especially in Ntcheu, where land preparation is all done by hand, without the use of draught animals, and this gives them leverage in control of the benefits from irrigation. The fact that men are considered important in providing labour enables them to negotiate their relationships with their wives. Zwarteveen (1997) notes that, in Burkina Faso,

**TABLE 8.2** Landownership and control of income earned

<i>Control of income earned</i>		<i>Irrigating</i>		<i>Non-irrigating</i>		<i>All respondents</i>	
		<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Family owned	Male	–	–	41	17.8	41	17.8
	Female	–	–	27	11.7	27	11.7
	Both	–	–	41	17.8	41	17.8
Rented	Male	22	9.6	4	1.7	26	11.3
	Female	43	18.7	11	4.8	54	23.5
	Both	38	16.5	3	1.3	41	17.8
Total		103	44.8	127	55.2	230	100.0

Source: Authors' field work

intra-household access to and control of labour is one of the key factors for addressing the agricultural productivity challenge. Although wives are the landowners, men who provide the labour make key decisions on crop choice. Elsewhere, Sokile and van Koppen (2004) note that in Tanzania husbands are under a lot of pressure to provide labour as women can easily divorce unproductive husbands and replace them with more productive alternatives. Men can be divorced for being 'useless', for drinking too much or for being unable to provide for their families (interview, 20 July 2014). In our male focus group discussions, it was pointed out that men are sometimes kicked out after many years of hard work, and this can act as a disincentive to put in their best effort. Some men also indicated that they were reluctant to invest in 'good' houses, as these would be lost in the event of divorce. In Ntcheu, the procedure for divorce was said to be straightforward, as long as the wife's uncles endorsed her decision. 'The wife would simply give a light, and now they are using torches from China, to show you the way back to your parents' home, since it would have been a while since you were there and you might have forgotten the way back to their house.'

### Collective action in irrigated agriculture

Although land is nominally in the woman's name, irrigated agriculture offers an opportunity for men to engage in agriculture in their own names. Once land has been converted into irrigated land, its value is enhanced and men can lease it in their own names as the irrigation is collectively managed. This creates an opportunity for men who do not normally inherit land to gain access to land whose value has been increased.

The irrigation scheme began in 2005, comprising just six women and six men. By the time of our field research in 2014 and 2015, there were 53 female and 22 male irrigators. Leasing of land for irrigated agriculture entails having the ability to pay the rental lease value and to provide labour. Labour is required in two ways. First, there is a need to cultivate on the irrigated plot during the dry season, after harvesting of the rain-fed crops has been completed. Second, irrigated agriculture takes

place only during the dry season, after which the irrigators must prepare the land for the landowner, who cultivates the land in the wet season.

### Water users' association

Having a voice over institutions that manage common property resources, such as irrigation systems, is very important (Agrawal, 1994). The irrigation in Kandeu is organized by the One Apex Kaziputa Water Users' Association (WUA), which is divided into five lower-level associations (clubs): namely, Lithethe, Chimwalira, Gobeke, Namichimba and Chikumbi. At the time of our research, the Apex Kaziputa WUA was led by men (chairman and vice-chairman), and comprised a total of five men and five women. Thus, men held the most influential positions. The secretary and her deputy were both female, as was the treasurer. The irrigators stressed that positions such as treasurer were usually reserved for women, as they were perceived as more prudent than men, and so more likely to safeguard the WUA's funds. While discussing the fact that men held the most powerful positions in the WUA even though women were the majority water users and had equal representation on the scheme's management platform, gender power differentials started to emerge. Although women traditionally owned the land in Ntcheu, it was perceived that roles such as chair of the WUA entailed a lot of travelling. Zwarteveen and Meinzen-Dick (2001) argue it is important to understand that women's effective engagement in WUAs is influenced by social constructs of their roles, which include domestic chores and taking care of children, which limit their ability to assume more influential positions. Nonetheless, it is important that women participate in the decision-making process on irrigation in order to benefit from irrigated agriculture.

Table 8.3 looks at the WUA and how both men and women perceived its effectiveness, their participation in elections and their labour contributions. Both men and women had a positive view of the WUA, participated in elections and

**TABLE 8.3** Water users' association

		<i>Male</i>		<i>Female</i>		<i>Total</i>	
		<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Irrigation management committee (IMC) effective?	Yes	18	26.1	47	68.1	65	94.2
	No	1	1.4	3	4.3	4	5.8
Participate in IMC elections?	Yes	18	26.1	43	62.3	61	88.4
	No	1	1.4	7	10.1	8	11.6
Contribute to labour for maintenance of irrigation infrastructure?	Yes	19	27.5	48	69.6	67	97.1
	No	–	–	2	2.9	2	2.9

Source: Authors' field work

contributed labour. The WUA's by-laws, which were written in the local Chewa language, made it mandatory for all irrigators to provide labour unless they had an acceptable excuse. Those who violated the by-laws faced stipulated penalties, with expulsion the sanction for the worst offences or repeat offenders. The uniform application of these by-laws strained the gender roles, especially women's domestic chore demands. During our field trip to Ntcheu in October 2015, groups of irrigators were taking turns to pump water from a pool upstream so that they could irrigate their fields. Women mentioned that this requirement was having a negative impact on their children. The threat that they would not be able to irrigate if they did not take their turn on the treadle pump forced them to remain upstream, sometimes overnight. This was the beginning of an El Niño-induced drought which affected Southern Africa in 2015/2016, soon after a below-average 2014/2015 wet season. It is important to note, as Zwartveen and Meinzen-Dick (2001) argue, that discrimination sometimes emerges through formal and informal rules or even in everyday practices that do not accommodate the requirements of female irrigators.

### Marketing of irrigated produce

Access to and control of the benefits from irrigation are largely through controlling the benefits from the marketed irrigated produce. Ntcheu irrigators need to travel several kilometres across a mountain range to sell their produce at a large market. Since there is no direct transport to this main market, this entails setting off soon after midnight in order to be at the market very early in the morning, sell the produce and have time to travel back to Kaziputa. Women who were irrigators in their own right admitted that the trip was exhausting so they usually asked their husbands to go in their place, even though they knew the husbands would not bring back all the money from selling the produce. 'Women bring all the money from the market but men don't bring all the money. Women till the soil, don't see the money. The husband "tastes" the money first' (female focus group, 20 July 2014). Even though some of the market returns were diverted by men for use elsewhere, women perceived the amount of effort required to cross the mountain range as outweighing the money they lost. They also mentioned that they had to perform domestic chores and prepare their children for school, so it would be very difficult for them to go to market themselves. One of the key challenges in Ntcheu is the issue of men's excessive alcohol consumption, and some of this is funded by the money they make at market.

Interestingly, even the village head who had previously indicated that men had no power over the land highlighted that, when it came to selling produce at the market, the activity was done jointly (*simunye*): 'It's like we are hunting and we are putting everything in one basket' (interview, 23 July 2014). Table 8.4 shows both male and female attendance at market, and the estimated distance to each of the markets.

**TABLE 8.4** Attendance at produce markets and distances

<i>Where do you sell your produce?</i>	<i>Distance (km)</i>	<i>Irrigating</i>		<i>Non-irrigating</i>		<i>All respondents</i>		
		<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	
Male	Kandeu (locally)	4	6	14.6	9	22.0	15	36.6
	Lizulu	12	1	2.4	3	7.3	4	9.8
	Mlangeni	10	2	4.9	1	2.4	3	7.3
	Ntcheu boma	35	13	31.7	6	14.6	19	46.3
Total			22	53.7	19	46.3	41	100.0
Female	Kandeu (locally)	4	28	29.5	20	21.1	48	50.5
	Lizulu	12	1	1.1	1	1.1	2	2.1
	Mlangeni	10	4	4.2	5	5.3	9	9.5
	Ntcheu boma	35	19	20.0	17	17.9	36	37.9
Total			96		81		177	100.00

Source: Authors' field work

## Access to irrigation extension

Gendered power dynamics also play out in terms of access to agricultural extension information. For women farmers to be able to participate effectively in farming activities they need to be able to access agricultural extension. In Kaziputa, the irrigation scheme falls under the Kandeu Extension Planning Area (EPA). This is the lowest-level unit covered by extension officers, consisting of a number of villages which combine to form the EPA, which is akin to a ward. In the Kandeu EPA, all of the extension officers were male. While gender was becoming increasingly important in the extension reports, most of the extension staff did not receive training on gender to appreciate why gender matters in agricultural extension. Some of the staff who participated in our research admitted that they were frequently asked to disaggregate data by gender, but most of them did not understand why doing so would make a difference. Extension information was usually conveyed to the head of the household, even if the land was owned by a woman. Table 8.5 provides results on agricultural extension based on our questionnaire.

## Access to inputs for irrigated agriculture

One of the key concerns among irrigators was that while it was important to have access to water for irrigated agriculture, having land and water alone was necessary



**TABLE 8.5** Access to an agricultural extension worker

<i>Access to an agricultural extension worker</i>	<i>Irrigating (n=75)</i>		<i>Non irrigating (n=62)</i>		<i>All respondents (n=137)</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Male	19	25.3	10	16.1	29	21.2
Female	49	65.3	13	21.0	62	45.3
All – yes	68	90.7	23	37.1	91	66.4
All – no	7	9.3	39	62.9	46	33.6

Source: Authors' field work

but not sufficient for increased productivity. Agricultural inputs such as improved seed, chemicals and fertilizers were also needed to increase output on the irrigated land. In instances where some of the irrigators were women, they indicated that they relied on their husbands for the requisite inputs to be able to produce something substantial from irrigated agriculture. Access to credit, though limited, seemed to be more accessible to men than women. The government-subsidized fertilizer programme also favoured those who had more access to cash. NGOs such as CARE were promoting saving schemes (such as Banka Inkonde) to help farmers access capital, which could be used for agricultural inputs.

Table 8.6 shows the average cost of inputs bought by men and women. The average costs of transport are also included. Despite the land belonging to the women, men bought nearly double the amount of inputs as women. This has important implications since ownership of land might not necessarily translate into ownership and control of inputs and therefore crop choice. This is why in gender analysis it is important but not sufficient to know under whose name an asset is registered. Hence delving into access and control dimensions will enable a better understanding of the costs and benefits accruing to both men and women.

Table 8.7 shows perceptions of the role of women in agriculture. The findings show that 30 per cent of the irrigating respondents felt that women contributed more than men to agriculture. What is intriguing here is that the majority of the irrigators were women, so some of them did not feel they were contributing more than the men. Gender disaggregated analysis shows that 12 per cent of the men felt

**TABLE 8.6** Cost of inputs

<i>Past 12 months</i>		<i>Mean (Mkw)</i>	<i>Mean (US\$)</i>
Average cost of input	Male	53,676.4	135.21
	Female	29,285.7	73.77
Average transport costs	Male	2,795.3	7.04
	Female	3,500.6	8.82

Source: Authors' field work

**TABLE 8.7** Perceptions of women's contribution to agriculture

<i>Women's control over agricultural inputs</i>		<i>Male</i>		<i>Female</i>		<i>Total</i>	
		<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Irrigating (n=75)	More than men	9	12.0	23	30.7	32	42.7
	Less than men	6	8.0	13	17.3	19	25.3
	Equal	7	9.3	17	22.7	24	32.0
Non-irrigating (n=55)	More than men	4	6.5	17	27.4	21	38.2
	Less than men	5	8.1	11	17.7	16	29.1
	Equal	7	11.3	11	17.7	18	32.7

Source: Authors' field work

that women did more than they did, while 30.7 per cent of the female irrigators felt that they did more than the men.

### Access to credit

Credit was obtained mostly from local financial groups (such as Banki Nkhonde), followed by Opportunity Bank, and lastly from neighbours. Potential sources of credit are: ARISE, Banki Nkhonde (local microfinance group), Limbe Leaf (for tobacco growers), Malawi Rural Development Fund (MARDEF), Opportunity Bank, National Smallholder Farmers' Association of Malawi (NASFAM) and, surprisingly, the Safe Motherhood non-governmental organization. Table 8.8 shows who obtained credit. Although men formed a smaller percentage of the irrigating farmers, they still managed to access more credit than women. This disparity was despite the efforts of non-governmental organizations which have been attempting to create a level playing field for credit by encouraging lending to women. In a number of instances where loans were advanced to women, men would decide on how to use the funds once the loans had been disbursed to the women, leaving the latter with the loan risk.

**TABLE 8.8** Who obtained credit?

<i>Who obtained credit?</i>	<i>Irrigating</i>		<i>Non-irrigating</i>		<i>Total</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Male	19	41.3	18	58.1	37	48.1
Female	27	58.7	13	41.9	40	51.9
All	46	100.0	31	100.0	77	100.0

Source: Authors' field work

**TABLE 8.9** Group membership

	<i>Membership</i>	<i>Irrigating</i>		<i>Non-irrigating</i>	
		<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Religious group	Male	11	14.7	16	25.8
	Female	64	85.3	46	74.2
Farmers' organization	Male	5	6.7	1	1.6
	Female	12	16.0	4	6.5
Women's organization	Male	2	2.7	6	9.7
	Female	6	8.0	1	1.6
Savings club	Male	6	8.0	3	4.8
	Female	43	57.3	17	27.4
Irrigation committee	Male	13	17.3	0	–
	Female	38	50.7	0	–

Source: Authors' field work

**TABLE 8.10** Barriers to agricultural production for irrigators

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Lack of fertilizer	21	48	69
Poor access to markets	14	28	42
Poor soils	6	22	28
Lack of capital	11	12	23
Land shortage	4	22	26
Lack of farming equipment	4	9	13
Other	2	0	2
Pests	1	5	6
Low rainfall	0	5	5
Lack of labour	0	2	2

Source: Authors' field work

## Social capital

Membership of collective organizations also reflects social capital, which can be mobilized in other arenas, such as irrigated agriculture. It is interesting to note that some men were members of women's organizations, and of savings clubs that NGOs promoted specifically for women, as shown in Table 8.9.

Table 8.10 shows the barriers to agricultural production for both men and women. While the top three barriers were common among men and women, it is interesting that 'poor soils' ranked far higher among women. Further discussions showed that this is usually related to lack of inputs to address that challenge.

Although women are the owners of the land, it is interesting that land shortage is one of their key barriers to increased agricultural production.

## Discussions and conclusion

Tenure is not absolute – it is fluid, created, challenged, modified, negotiated and reconfigured – hence the importance of what Fortmann (1995) refers to as ‘tenurial niches’ (see also Fortmann and Bruce, 1988). No one has absolute ownership of property, hence the notion of tenurial niches. While it is important for women in Ntcheu to have the land passed on to them from their mothers, that on its own will not translate into meaningful control of the benefits accruing from the land. Land values tended to be valorized through use for irrigation. Once the commercial value of the land rises, more men become interested in irrigated agriculture. While land is a key asset in the irrigation schemes of Kaziputa, it is also important for the landowner to have access to the WUA in order to influence its decisions, to derive the best value from the market, to gain access to irrigation extension, agricultural inputs and credit, to have social capital and to have access to and control over the benefits coming from irrigated agriculture. It is by meaningfully deriving benefits from the land they own that nominal title ownership will yield benefits for the women that tend to be more beneficial to the household (Johnson et al., 2016).

Collective action within irrigated agriculture is meant to jointly resolve collective challenges, such as water allocation, land use and in some instances joint marketing efforts. In Malawi’s Ntcheu District, it has often been assumed that the matrilineal and matri-local (*Chikamwini*) nature of the society enhances and empowers women in irrigation and agriculture more generally. Our study indicates that while landownership is an important step, on its own it is not adequate to be used as an empowerment indicator for women in Ntcheu. Although women are the landowners, their participation in the WUA is similar to that found in patriarchal areas, where men take leadership positions, such as chair and vice-chair, while women are assigned the lesser roles of secretary and treasurer. Also, although there were more female than male members of the WUA, there were equal numbers in the association’s committee.

The research therefore encourages a more critical review of collective action for agricultural water management in order to ensure that gender power asymmetries are taken into account in collective action decisions so that women are not left behind in collective decision-making for increased agricultural productivity. As commons researchers, we need to avoid the binary of male and female ownership and start looking at the gradient from female to male. This will enable us to address the multiple stories and competing narratives.

There is a need to address issues of access and distributional equity – who gets what? This calls for going beyond the neat bureaucracy to look at the social, economic, political and gendered dimensions of land tenure in the context of collective action. There is also a need to monitor the gendered dynamics, processes and

sub-processes of the tenurial niches within the Kandeu area, as Fortmann (1995) argues with respect to the forestry sector. Such an analysis is most likely going to further scholarship on the ‘paradox of landownership’ which is not translating into control of benefits for the women of the Ntcheu area of Malawi. The paradox could be explained by the underlying structural or cultural barriers which limit women’s engagement in the public sphere and the demand for women to continue to do household chores, which gives men more freedom to engage beyond the household. Agricultural extension also still sees men as the ‘farmers’, thereby undermining the role of women, despite their access to and ownership of the land.

## References

- Agrawal, B. (1994). *A Field of One’s Own: Gender and Land Rights in South Asia*. Cambridge: Cambridge University Press
- Berkes, F. and Farvar, M.T. (1989). Cooperation from the perspective of human ecology. In F. Berkes (ed.) *Common Property Resources: Ecology and Community Based Sustainable Development*. London: Belhaven Press
- Bromley, D.W. (1991). *Environment and Economy: Property Rights and Public Policy*. Oxford: Blackwell
- Bromley, D. and Cernia, M. (1989). *The Management of Common Property Natural Resources and Some Conceptual Fallacies*. Washington, DC: World Bank
- Chikozho, C. and Mapedza, E. (forthcoming). In search of socio-ecological resilience and adaptive capacity: Articulating the governance imperatives for improved canal management on the Barotse floodplain, Zambia. *International Journal of the Commons*
- Fortmann, L. (1995). Talking claims: Discursive strategies in contesting property. *World Development* 23(6): 1053–1063
- Fortmann, L. and Bruce, J.W. (1988). *Whose Trees? Proprietary Dimensions of Forestry*. Boulder: Westview Press
- Hardin, G. (1968). The tragedy of the commons. *Science* 162(13): 1243–1248
- International Organization for Migration (2015). *Migration in Malawi: A Country Profile 2014*. Geneva: IOM
- Jodha, N.S. (1992). *Common Property Resources: A Missing Dimension to Development Strategies*. Washington, DC: World Bank
- Johnson, N.L., Kovarik, C., Meinzen-Dick, R., Njuki, J., and Quisumbing, A. (2016). Gender, assets, and agricultural development: Lessons from eight projects. *World Development* 83: 295–311
- Kabeer, N. (1991). Gender, production, and well-being: Rethinking the household economy. IDS Discussion Paper 288. Brighton: IDS
- Meinzen-Dick, R. (2014). Property rights and sustainable irrigation: A developing country perspective. *Agricultural Water Management* 145: 23–31
- Meinzen-Dick, R., Raju, K.V., and Gulati, A. (2000). What affects organization and collective action for managing resources? Evidence from canal irrigation systems in India. Paper presented at 8th Biennial Meeting of the International Association for the Study of Common Property, Bloomington, IN, 31 May–4 June
- Murphree, M.W. (1991). *Communities as Institutions for Resource Management*. Harare: CASS
- Murphree, M.W. (1994). The role of institutions in community-based conservation. In D. Western, R.M. Wright, and S.C. Strum (eds) *Natural Connections: Perspectives in Community-Based Conservation*. Washington, DC: Island Press

- Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Actions*. Cambridge University Press: Cambridge
- Ostrom, E. (1992). *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco: ICS Press
- Ostrom, E. (1993). The rudiments of a theory on the origins, survival, and performance of common-property institutions. In D. Bromley (ed.) *Managing the Commons: Theory, Practice and Policy*. Oxford: Basil Blackwell
- Ostrom, E. (1999). Coping with the tragedies of the commons. *Annual Review of Political Science* 1999(2): 493–535
- Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science* 325: 419
- Pandolfelli, L., Meinzen-Dick, R., and Dohrn, S. (2008). Gender and collective action: Motivations, effectiveness and impact. *Journal of International Development* 20(1): 1–11
- Quiggin, J. (1993). Common property, equality and development. *World Development* 21(7): 1123–1138
- Runge, F. (1992). Common property and collective action in economic development. In D. Bromley (ed.) *Making the Commons Work: Theory, Practice and Policy*. San Francisco: ICS Press
- Shah, T., van Koppen, B., Merrey, D., de Lange, M., and Madar, S. (2002). *Institutional Alternatives in African Smallholder Irrigation: Lessons from International Experience with Irrigation Management Transfer*. IWMI Research Report 60. Colombo: IWMI
- Sokile, C.S. and van Koppen, B. (2004). Local water rights and local water user entities: The unsung heroines of water resource management in Tanzania. *Physics and Chemistry of the Earth* 29(15–18): 1349–1356
- Stern, P.C., Dietz, T., Dolsak, N., Ostrom, E., and Stonich, S. (2002). Knowledge and questions after 15 years of research. In T. Dietz, N. Dolsak, E. Ostrom, and P.C. Stern (eds) *The Drama of the Commons*. Washington, DC: National Research Council
- Wily, L. (2000). Reconstructing the commons in Africa. Paper presented at the 8th Biennial Conference of the International Association for the Study of Common Property, Bloomington, IN, 29 May–4 June
- Zwarteveen, M. (1997). *A Plot of One's Own: Gender Relations and Irrigated Land Allocation Policies in Burkina Faso*. IWMI Research Report 10. Colombo: IWMI
- Zwarteveen, M. (1998). Identifying gender aspects of new irrigation management policies. *Agriculture and Human Values* 15: 301–312
- Zwarteveen, M. and Meinzen-Dick, R. (2001). Gender and property rights in the commons: Examples of water rights in South Asia. *Agriculture and Human Values* 18(11): 11–25