

# Formal and informal contract farming in Mozambique: Socially embedded relations of agricultural intensification

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## Funding information

DFID-ESRC Growth Research Programme (DEGRP), Grant/Award Numbers: ES/L01239/1, ES/L012391/1

## Abstract

This paper explores the role of contract farming arrangements in agricultural intensification in sub-Saharan Africa, combining secondary literature and original case material from Mozambique. The paper extends the scope of “contract farming” beyond the formal contracts between large companies and small-scale producers to include less formal credit agreements between farmers and traders. It argues that such informal contract arrangements are evidence of farmers' agency in “real markets.” In the studied cases, farmers use contract farming opportunities to intensify agricultural production by investing in irrigation and inputs. While informal contracts typically concern locally consumed crops, thus with more possibilities for side selling than formal contracts for export crops with company-controlled markets, informal contract compliance reflects closely knit social ties between the contracting parties. In both formal and informal contracts, purchasers tend to seek out producers who are already irrigating, thus obtaining gains from farmers' earlier investments. This also implies contract farming as a mechanism for accelerating social differentiation arising from unequal access to irrigation. The paper argues that the significance of informal contracts in the studied cases raises the possibility that informal contract farming by local traders plays a more important role in agrarian

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transformation in Africa than formal contract farming by large companies.

#### KEYWORDS

Africa, contract farming, irrigation, farmer-led irrigation development, Mozambique

## 1 | INTRODUCTION

This article focuses on the role of informal contracts between traders and small-scale farmers and argues that these are potentially more influential for agricultural intensification than formal contract farming with large companies. The paper draws on empirical evidence of informal contract farming associated with processes of farmer-led irrigation development.<sup>1</sup> Our work on this form of contract farming emanates from original research on farmer-led irrigation development, a process of agricultural intensification taking place across the continent, largely unnoticed by state and development agencies (De Bont & Veldwisch, 2020; Veldwisch et al., 2019; Woodhouse et al., 2017).

Though the extent of irrigated area developed by African farmers is not precisely known and in most countries not documented, there is ample evidence that, in aggregate, these areas may be very large and in many countries a multiple of the officially recognized irrigated area (Beekman et al., 2014; Cai et al., 2017; Venot et al., 2021). There is a growing awareness that farmer-led irrigation development in Africa is an important transformational process that has been taking place in a variety of contexts across the continent, leading to increased production of both staples and vegetables to supply growing urban markets (Izzi et al., 2021; Lankford & Wiggins, 2019; Veldwisch et al., 2019; Woodhouse et al., 2017). Almost by definition, this is also an exercise of agricultural intensification. Irrigating farmers make relatively high use of external inputs (seeds, fertilizers, pesticides, labour, and mechanization) to raise output primarily for sale in high-value urban markets (De Bont, Liebrand, et al., 2019). Market relations are varied and have different degrees of formalization, with informal trader networks as the most common intermediary. Such informal agreements with local traders may run in parallel with formal contracts with agro-export companies, but both serve as a mechanism to finance seasonal investment, which is a frequent requirement of crop growers in light of the increased use of external inputs. There are strong parallels between the ways in which farmers' agency operates in developing irrigated agriculture and in how it operates in developing and managing market relations. Moreover, both farmers' irrigation initiatives and informal contract farming have gone largely unrecognized for their rural development impact.

In this paper, we first set out to explore how contract farming has been defined and studied, linking it to the study of "real markets" and farmers' engagement with specific market mechanisms. We do this by drawing on primary case study research that illustrates the role of contract farming—both formal and informal—in agricultural intensification based on a combination of direct observations and in-depth interviews followed by a household survey. Our case studies compare two neighbouring communities in central Mozambique in which farmer-led irrigation development and contract farming arrangements have gone hand-in-hand. In many respects, such as hydrology, agronomic potential, markets, and migration, the two sites are similar, but they have experienced distinct trajectories of agrarian change. In particular, in one case, informal arrangements with local traders are most important while, in the other, formal contracts with an agro-export company predominate. In the paper, we trace the roots of these differences and assess their significance for processes of technological and socio-economic change. In doing this, we

<sup>1</sup>Sometimes, this is shortened to "FLID." In this paper, we eschew the acronym, following Billig (2013), who identified the excessive use of acronyms as one of the mechanisms through which human agency may be concealed. Rather than referring to FLID, we prefer to emphasize that farmers are leading the development of irrigated agriculture.

link the analysis of contract farming arrangements and trajectories of agrarian change to actually existing processes of agricultural intensification

## 2 | CONTRACT FARMING AND REAL MARKETS

In Critical Agrarian Studies, contract farming has recently been associated with contestation of land acquisition for agri-business ventures—the “global land grab” phenomenon. Amid international political controversy, companies were seen to move away from a single focus on acquiring land to farm directly to seeking control over agricultural production on land held by smallholder farmers (cf. Peluso & Lund, 2011). Together with a suite of other arrangements, contract farming is then seen as a means of avoiding the creation of enclosures while still achieving control over the use of land, water, and labour for agricultural production (Hall, 2011; Hall et al., 2015; Hall et al., 2017; Veldwisch, 2015; White et al., 2012). Although widely promoted by development agencies as a “win-win” “inclusive business model” from which smallholders can benefit (access to inputs, technology, and markets) while contributing to global food security (see, for instance, Vermeulen & Cotula, 2010), critics have argued that a political economy perspective reveals “smallholders serving corporate markets at the expense of local food security” and a risk of increasing socio-economic differentiation (McMichael, 2013, p. 671). This is an extension of the classic analysis by Little and Watts (1994), who already identified contract farming arrangements as potentially being a “disguised wage relationship” with smallholders reduced to labourers on their own land, while also bearing the risks of crop failure, indebtedness, and adverse power relations of market monopsony. In this paper, we seek to illuminate the role of contracts in advancing credit for farming intensification and its potential impact on agrarian change. In this, we draw on Bernstein and Oya's (2014) arguments for critical analysis of “real markets” in the livelihoods of small-scale farmers.

There is a wide diversity of arrangements referred to as “contract farming.” In his review, Oya (2012) observes that Little and Watt's (1994, p. 9) definition is very comprehensive: “forms of vertical coordination between growers and buyers-processors that directly shape production decisions through contractually specifying market obligations (by volume, value, quality, and, at times, advanced price determination); provide specific inputs; and exercise some control at the point of production (i.e. a division of management functions between contractor and contractee).” Moreover, he notes that the definition cannot easily exclude contracts where “control at the point of production” may be subtle and indirect. He goes on to point out that, while the recent focus of contract farming studies has been on private-sector agri-business contracts with small-scale “outgrowers” around “core estates” (managed directly by agri-business) or supplying agricultural processing and trading corporations, the definition above might also apply to state or parastatal marketing boards' arrangements in the 1960s and 1970s. In this paper, we argue that the definition might also substantively be applied to less formal agreements between local traders who provide their small-scale suppliers (farmers) with seasonal credit to purchase inputs such as agrochemicals in return for rights to purchase the crop. We feel this is important because farmers do not necessarily recognize such informal arrangements as “contracts” although they perform much the same function as more formal contracts with large corporations.

The challenges that African farmers face to finance their seasonal investments get timely access to agricultural inputs and then to turn their produce into economic value have long been recognized and have intensified since “liberalization” of markets in the 1980s (Poulton et al., 1998). In this regard, contract farming is consistent with an institutional economics view that emphasizes its function in addressing a variety of “market failures,” for instance, by providing seasonal credit, access to inputs, and guaranteed output markets (Abebe et al., 2013). Indeed, Poulton et al. (1998) identified contract farming as one of a number of ways to create “interlocking contracts” (to provide inputs in return to rights to purchase outputs) they considered a key requirement to expand smallholder cash cropping. However, they regarded these as relevant only to “traditional” export-focused crops, such as tobacco, cotton, or cashew, but not to food crops that rarely used agrochemical inputs. This has substantially changed in the past

two decades as accelerating African urbanization has turned many food crops, especially high value fruit and vegetables and higher yielding staples such as rice, into cash crops. This has created incentives to intensification, particularly through irrigation and agrochemical inputs.

These changing market dynamics for small-scale farmers in Africa suggest a need to re-visit relationships between technical and social change. In particular, it suggests a need to study “real markets” from the perspective of “farmers actively mak[ing] and act[ing] on choices in their evolving context” (Vorley et al., 2012, p. 63). In these real markets, small farmers mainly sell to local traders, often within broader social relations of trust and mutual benefit, sometimes through informal agreements or contracts that have similarities to the contract farming schemes of corporations. In this paper, we draw on evidence that such (informal) contracts between traders and farmers have played a role in financing (seasonal) investments in agricultural production inputs by small-scale irrigators in exchange for a sole-buyer agreement. This raises the possibility that traders' credit may be a significant source of working capital for agricultural intensification. In the rest of the paper, we first review the market-driven nature of farmer-led irrigation development, as a particular form of agricultural intensification, and then introduce the two case studies and their contract farming aspects. We conclude by discussing the implications of informal traders' credit and purchase agreements for the theorization of contract farming within processes of agrarian transformation.

### 3 | MARKET ARRANGEMENTS AND FARMERS' IRRIGATION INITIATIVES

In the growing literature documenting farmer-led development of irrigated agriculture, the analysis of market relations takes a prominent place, as demonstrated and discussed in this section. A survey of 18 sites of farmer-led irrigation development in Mozambique and Tanzania found irrigating farmers selling, on average, 13 and 5 times more crops (by value) respectively than non-irrigating neighbours (De Bont, Liebrand, et al., 2019). In the same survey, irrigated crops were reported as providing at least half of their total household income by no fewer than 67% and 83% of irrigators at sites in Mozambique and Tanzania, respectively. These processes are linked to demand from growing urban markets and involve a considerable and recurrent investment in irrigation technology, labour, agricultural inputs, and expansion of irrigated area (De Bont, Liebrand, et al., 2019). The nature of the market relations varies from case to case. Many documented cases have a clearly dominant crop, such as potatoes, tomatoes, or onions, though there are also cases with more variety. The crops and their diversities have an influence on the organization of marketing and the dynamics of demand and supply in relation to seasonal weather and water availability.

In the majority of reported cases of farmer-led irrigation development, small-scale farmers primarily produce vegetables for nearby urban markets (e.g., De Bont, Komakech, & Veldwisch, 2019; Gross & Jaubert, 2019; Harrison & Mdee, 2017; Hebinck et al., 2019; Scoones et al., 2019). However, some crops are traded over larger distances, including export across international frontiers through informal networks. This is the case in the extensive mountain stream irrigation systems of Tsangano, in Northern Mozambique, that are somewhat isolated from the rest of that country but are linked via informal trade to an international trade route along the Malawi border. This makes it possible for farmers to get cash for their potatoes, which travel onwards from Malawi, as far as Tanzania (Nkoka et al., 2014). Similarly, onions irrigated from boreholes in the Kahe area in Northern Tanzania are grown for sale in Kenya (De Bont, Komakech, & Veldwisch, 2019).

While mostly ignored by states and development organizations, these developments have been noticed by traders, supermarkets, and agricultural corporations, and they have started engaging with farmers. Scoones et al. (2019) report that local supermarkets in Zimbabwe source their agricultural produce through contracts with irrigating smallholders. Small-scale producers with access to irrigation are capable of reliable output, and agro-export companies that source their produce from smallholder “outgrower” communities have also recognized this advantage of working with farmers that irrigate. Some contract farming schemes have particularly sought to engage farmers that have started irrigating by themselves. For instance, this is reported for sugar and citrus in Zimbabwe (Scoones et al., 2019) and is also common for French beans grown for export from Kenya (Thotoli et al., 2019). Such

contract-farming schemes effectively lead to agro-export companies gaining control over prime irrigated areas and their production processes. This has parallels to the analysis that many companies securing land deals in sub-Saharan Africa in the “land grab” following the 2008 food crises were not looking at “empty land,” but rather for prime land with good access to water (Mehta et al., 2012; Woodhouse, 2012). Of course, it is not only irrigated crops that are mediated by trading networks with more or less formal contracts linking credit advances to monopsony rights. A question to which we shall return below is whether market-related contracts associated with farmer-led irrigation development are characterized by particular power relations and outcomes. We now turn to consider our case studies from central Mozambique.

## 4 | IRRIGATION FROM MOUNTAIN STREAMS IN CENTRAL MOZAMBIQUE

We consider contract farming in two neighbouring areas of small-scale farmer-led irrigation development in central Mozambique. The empirical data were generated as part of a broader comparative study<sup>2</sup> of farmers' irrigation initiatives at 18 sites in Tanzania and Mozambique. We draw on interviews with irrigators and other key informants undertaken in 2015–2017 to trace the trajectory of irrigation development in both areas from the colonial period, through a series of major upheavals following independence, insurgency, and depopulation, and a more recent phase of post-war resettlement over the past 25 years. At each site, a qualitative analysis of organizational and institutional aspects was complemented by a survey of farming methods and outputs of irrigating and non-irrigating households. We start by sketching the geographical and historical contexts.

The hills of Manica Province, in central Mozambique, are well located for the development of commercial agriculture. They are traversed by the main road linking Harare (Zimbabwe) with the port of Beira on the Mozambique coast, and they experience levels of rainfall (average annual 1100 mm) regarded as favourable for agriculture. Under Portuguese colonial administration, the area was an important site of settlement for European farmers and for commercial production of maize, high-value fruit and vegetable crops, cattle, and intensive poultry. Following the independence of Mozambique in 1975, the majority of Portuguese settlers left, abandoning their farms. This country-wide phenomenon and the associated drop in agricultural production were intensified along the “Beira corridor” as the new Mozambican government implemented UN trade sanctions against UDI Rhodesia,<sup>3</sup> by closing the frontier to freight traffic.

The government sought to maintain production on farms abandoned by settlers, either by using foreign investment to equip and manage them as state-operated mechanized farms or by promoting their occupation by local small-scale producers organized into cooperatives. However, agricultural production remained depressed by the insecurity associated with the intensifying conflict up to Zimbabwean independence in 1980 and then by insurgency and armed conflict that depopulated the area and severely disrupted the economy for most of the decade 1982–1992. An end to armed conflict in 1992 set in train a process of political and economic liberalization associated with a rapid repopulation of central Mozambique. Census data show the Manica Province population increased by a million people from 1997 to reach 1.91 million in 2017. The rural Manica hills accounted for a third of this rise, outstripping even the rapid growth of the Provincial capital, Chimoio. Much of this population growth appears due to migration of people from other parts of Mozambique, but part has also resulted from immigration from Zimbabwe, including farmworkers of Mozambican origin, following the “fast track” land reforms in Zimbabwe during 2000–2002 (Bolding & Piloto, 2013).

<sup>2</sup>safi-research.org

<sup>3</sup>The European settlers in the colony of southern Rhodesia unilaterally declared independence (UDI) from the United Kingdom in 1965 in order to block black majority rule that would have followed the planned end of British colonial administration. The UDI state was declared illegal and was the subject of UN trade sanctions until its replacement by democratic elections and the creation of the republic of Zimbabwe in 1980.

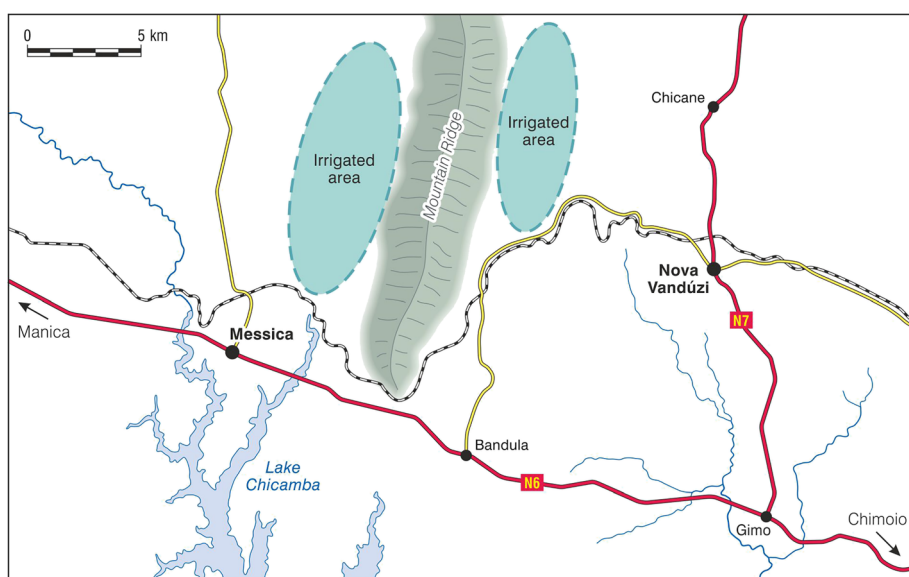
Although some irrigation structures, notably small dams and canals, were constructed by individual Portuguese settlers, over the past decade, researchers working in the Manica hills have documented irrigation extending over tens of thousands of hectares and increasing between 3% and 4% per year (Beekman et al., 2014; Bolding et al., 2010). Much of this irrigation follows a pattern widely used in East Africa, termed “hill furrows” (Adams & Anderson, 1988). Small-scale farmers use their own resources to construct weirs in streams to divert water into hand-dug earth canals to transport it to their fields, sometimes over several kilometres. In this paper, we examine two irrigated areas that we shall term “Vanduzi” and “Messica” that lie on opposite sides of a mountain known locally, and variously, as *Messica* or *Nhaumbwe* to the north of the administrative centre (*posto administrativo*) of Bandula in the upper catchment of the Revué river, itself part of the Búzi river basin (see Figures 1 and 2).

In the area of our study, agriculture has three growing seasons. A wet season (December–March) is the focus of rainfed cultivation of the staple maize crop. A dry and cool “winter” season (April–July) is the main period for horticultural production. A dry and hot “summer” season (August–November) is most susceptible to water shortage, but presents opportunities due to high market prices for horticultural crops. The primary source of irrigation is water in perennial streams originating on the slopes of the Messica/Nhaumbwe mountain. These have fairly stable base flows due to contributions from groundwater, particularly in their lower reaches (Weemstra et al., 2014), allowing between 1 and 10 L/s to be diverted into earthen irrigation canals, but these may dry up towards the end of the “summer.”

The Vanduzi case study is located in the locality (*povoação*) of Belas, in which seven rivers flowing down the mountain are all considered permanent but with reduced flows during the dry season. In this area, abandoned settler farms were run as state farms 1976–1982. Although the state farms were closed during armed conflict in 1982–1992, and the land subsequently farmed by small-scale farmers (sometimes in competition with larger scale private land claimants), the previous state management of the land appears to have left expectations of further formal interventions by both state and non-state agencies. This led to a series of efforts to rehabilitate and further develop irrigation by small-scale farmers, most recently through the World Bank-funded PROIRRI project. In addition to physical infrastructure, interventions have focused on establishment of formal farmers' irrigation associations including through vesting of formal rights to land (DUAT), as well as water, in these associations. It was perhaps logical, therefore, that the area has also been the main focus of corporate contract farming activity.



**FIGURE 1** Central Mozambique



**FIGURE 2** Map of the two case study areas: Messica and Vanduzi

In the Messica case study area, just on the other side of the mountain range, six small streams flowing from the mountain are used for irrigation. In contrast to the situation in Vanduzi, in Messica, colonial farms abandoned at independence were designated as “cooperatives,” with a strong degree of self-organization allowed. As in Vanduzi, the progress of post-colonial agriculture was interrupted by a decade of insecurity and depopulation. Since the end of the war, as in Vanduzi, land has been claimed and occupied by small-scale farmers, sometimes in competition with larger scale operators, but, in contrast to Vanduzi, very little external intervention has taken place. As a consequence, the approximately 53 canals developed by people of the communities of Ruaca and Chirodzo remained relatively unregulated by government agencies and experienced a much “lighter touch” intervention by the Dutch-funded MIPP project seeking to increase the benefits from irrigated agriculture (Beekman & Veldwisch, 2016).

These differences in development histories have led in the Vanduzi case to greater investment in infrastructure and equipment but also greater formalization of farmers' associations, while in the Messica case, very little external intervention has taken place, and irrigation development is relatively unregulated. As we show in the next section, the two cases have distinctly different market relations broadly and different contract farming arrangements in particular.

## 5 | FORMAL AND INFORMAL CONTRACT FARMING ARRANGEMENTS IN MESSICA AND VANDUZI

The descriptive statistics in Tables 1 and 2 are derived from a questionnaire survey undertaken in 2017 with irrigating and non-irrigating households. The sample was randomly selected in each area, with the condition that at least 50 non-irrigating households should be included. This means that the sample is not representative of the proportions of irrigating and non-irrigating households in each area, but it is representative of different types of farmers within “irrigating” and “non-irrigating” categories. The data are disaggregated into six clusters (using SPSS two step cluster analysis) defined by five variables: use of irrigation (yes/no); gender of head of household; and household ownership of three different asset value classes (high, medium, and low). The clusters produced by this procedure were as follows:

TABLE 1 Average household size and land holdings per household at each site and disaggregated by cluster

	N	Number of members per household	Active adults aged 16–64)	Percent of households that hire labour	Total farm area (ha) per household	Area harvested of irrigated crops (ha)	Estimated irrigable area (ha) per household	Percent of total land irrigable	Percent irrigable rented	Percent irrigable purchased	Crop diversity (number of crops grown)
Messica	245	7.27	3.22	34.7	5.65	1.76	1.93	34.3	3.3	20.8	2.5
HiValAssets	17	8.53	3.35	41.2	7.53	2.16 <sup>a</sup>	2.44 <sup>a</sup>	32.4 <sup>a</sup>	7.2	26.5	2.4
Irr_rich	68	9.66	4.40	54.4	7.02	3.46	3.67	52.3	2.6	13.8	3.4
Irr_poor	61	6.38	2.54	31.1	5.83	2.18	2.61	44.8	3.9	30.5	2.7
FHH_irr	11	7.45	4.09	18.2	5.73	2.50	2.14	37.3	0.0	19.1	3.1
non_irr	72	6.10	2.76	25.0	4.40						1.6
FHH_no_ir	16	4.38	2.13	12.5	2.63						1.5
Vanduzi	159	6.82	3.13	49.7	3.21	1.24	1.18	36.7	6.3	14.8	3.1
HiValAssets	11	8.73	4.27	45.5	3.86	2.68 <sup>b</sup>	2.18 <sup>b</sup>	56.5 <sup>b</sup>	3.8	12.5	3.3
Irr_rich	57	7.72	3.82	71.9	3.46	1.93	1.92	55.4	3.2	14.6	3.9
Irr_poor	28	5.29	2.46	50.0	2.99	1.43	1.19	39.9	17.9	20.3	3.5
FHH_irr	11	4.64	2.09	36.4	2.90	1.59	1.90	65.5	7.2	9.6	3.2
non_irr	36	6.75	2.56	30.6	2.97						1.9
FHH_no_ir	16	6.63	3.06	25.0	3.04						2.3

<sup>a</sup>29% of the households in this cluster are not irrigating.

<sup>b</sup>10% of the households in this cluster are not irrigating.



**TABLE 2** Crop marketing by households (mean values by cluster)

	N	Percent of total crop harvest (value) sold	Percent of irrigated crop harvest (value) sold	Gross annual income (USD) from crop sales per household	Net income (USD per ha of irrigated crops)	Households using irrigation earning at least half of total income from irrigated crops (%)	% of households growing crops on contract
Messica	245	40.1	43.0	716.4	197.5	84.2	8.6
HiValAssets	17	47.9	55.5	1231.5	316.1	100.0 <sup>a</sup>	5.9
Irr_rich	68	59.4	75.2	1631.4	369.4	85.3	19.1
Irr_poor	61	49.3	61.8	519.8	264.3	82.0	4.9
FHH_irr	11	51.6	63.2	715.8	159.8	72.7	9.1
non_irr	72	18.7		55.8			4.2
FHH_no_ir	16	2.8		2.2			0.0
Vanduzi	159	45.6	53.5	587.7	173.3	88.7	33.3
HiValAssets	11	43.6	64.4	1817.2	538.8	90.0 <sup>b</sup>	18.2
Irr_rich	57	70.1	83.6	768.6	213.9	94.7	59.6
Irr_poor	28	61.7	75.7	844.0	316.7	78.6	35.7
FHH_irr	11	68.8	83.2	441.2	51.2	81.8	63.6
non_irr	36	5.8		21.8			0.0
FHH_no_ir	16	4.9		23.0			0.0

<sup>a</sup>29% of the households in this cluster are not irrigating.<sup>b</sup>10% of the households in this cluster are not irrigating.

1. Owners of high-value assets (not all of whom use irrigation) [HiValAssets]
2. Irrigators with high asset ownership scores [Irr\_rich]
3. Irrigators with low asset ownership scores [Irr\_poor]
4. Female-headed households that irrigate [FHH\_irr]
5. Male-headed non-irrigating households [non\_irr]
6. Female-headed non-irrigating households [FHH\_no\_irr]

Landholdings are larger in Messica than in Vanduzi, particularly among the wealthier households, whose total landholdings in Messica, averaging 7 ha per household, are about double those in Vanduzi. The difference in landholdings between the wealthiest and poorest is also more marked in Messica than in Vanduzi. In general, the poorest groups (non-irrigators and female-headed households) average from 2.5 to 3 ha in both places. Household size, in terms of total members and numbers of working-age adults follow similar patterns as landholdings—that is, they tend to show human resources are larger for households with larger landholdings.

Those households that are irrigating have larger landholding than those that are not, with the exception of a small number of households (5 in Messica and 1 in Vanduzi) with high value assets (e.g., vehicles and motorized equipment) and large landholdings but who do not irrigate. Irrigating households' apply water on average to between a third and two thirds of their total landholdings. Land purchases accounted for more than a fifth of irrigated land in Messica and a sixth in Vanduzi. Land purchases appear particularly important among irrigating households who are less asset-rich, suggesting a group with smaller landholdings who are seeking to expand. Renting-in of irrigated land accounts for smaller areas than land purchase. Although formal land titles are held by some farmers' associations,

particularly in Vanduzi (see below), the great majority of land rental and purchase arrangements do not involve formal titles and are conducted under local conventions that may involve written agreements and approval by local customary authorities.

The dramatic impact of irrigation on income from crop production is evident in Table 2, with upwards of two-thirds of the value of irrigated production being realized through sales. Lower rates of marketed output are apparent among the households with high value assets, indicating less intensity of market orientation than the other groups of irrigating households. However, more than 70% of irrigating households stated that the income from irrigated crops provides at least half of their total income. There are large disparities in value of gross sales that reflect differences in the size of landholdings among irrigating groups. Differences are less marked when comparing net income per hectare, except for female-headed households, who average markedly lower returns per hectare. Overall, however, the disparity in landholdings, use of hired labour, and income from irrigated crops for those able to irrigate suggests that farmers' own irrigation initiatives can provide the basis for a growing socio-economic differentiation in these rural communities. We now turn to the specific aspects of contract farming in the two areas.

Survey respondents were asked where they sold each crop that they grew. Sales of crops on contract were recorded for 6% (7/117) of the tomato crops in Messica, and for small numbers of other crops, including sesame (3/5 crops) and cabbage (1/19) in Messica, and cabbage (1/41), potatoes (1/2), and sunflower (1/5) in Vanduzi. However, the vast majority of the crops grown on contract are those whose sole buyer is a foreign-owned agri-business, the Companhia de Vanduzi. These are “baby corn” maize, chilli peppers, and green beans destined for export. The much greater scale of contract farming in Vanduzi is evident in the survey data (Table 2). Baby corn was recorded as grown for sale on contract in 71 instances in Vanduzi, compared with only eight in Messica. Similarly, 29 crops of chilli peppers were recorded as grown on contract in Vanduzi compared with 10 in Messica. However, Companhia de Vanduzi was not involved in contracts for other crops, notably tomatoes and cabbages, that are subject to less formal contract farming arrangements between growers and traders. We now consider these two types of contract farming—informal and formal—in more detail. The significance of contract farming may be under-reported in these survey data, as qualitative data indicates that growing crops on contract to local traders, in return for credit and assistance to acquire inputs such as seed and fertilizer, is a central feature of irrigation development by small-scale farmers in the area.

## 5.1 | Informal contract farming: multi-faceted agreements with local traders

Although less visible in our survey data, our observations and in-depth interviews suggested that the formal contracts with the Companhia de Vanduzi have somewhat obscured a much earlier practice of crops grown under contracts with local traders. In the Messica area, the expansion of irrigated tomato production since 2007 has been promoted by contracts between growers and private traders operating from the main vegetable market in Chimoio. Traders provided inputs to the farmer (on credit) in exchange for the right to buy their whole tomato crop. The dynamics and commercial incentives behind these tomato contracts between traders and growers in Messica have been described by Van den Pol (2012). He highlights the extreme variation in price of tomatoes in urban markets in central Mozambique and the incentive this provides to traders to secure access to high quality crops (grown with agrochemical inputs) during the off-season when prices are highest. He also documents the key role played by a small number of women traders in the central market of the provincial capital, Chimoio, in organizing and financing the production and logistics of the tomato crop in Messica. The development of this market has prompted individual irrigators to adopt different production and marketing strategies. Van den Pol (2012) identified how some farmers in Messica grow tomatoes extensively, mixed with other crops, and carry or bicycle small quantities to the roadside to sell directly to consumers. In contrast, others from the same community aim for high quality tomato production during the rainy season, which requires spraying frequently with fungicides, targeting a lucrative off-season market via transport to a nearby city. The same study identified another three distinct strategies of production and marketing of

tomatoes in the same area, all making use of similar forms of irrigation. Informal agreements with traders in this area resemble corporate contract farming schemes in the sense that they finance inputs in exchange for the right to buy the produce at harvest time. Such agreements are not written down and are highly based on trust. Most traders from the nearby city provided such arrangements for tomato farmers. Farmers, in return, referred to those traders as “special customers.” Over the period of a decade, farmers increasingly specialized in tomatoes and adapted their tomato varieties in coordination with traders they treated as their fixed customers. The high demand for tomatoes, particularly tomatoes of high quality, prompted traders to take initiatives to finance agricultural inputs such as seeds, fertilizers, and pesticides and sometimes also to deliver these to farmers. Farmers also maintain contacts with traders over mobile phones and sometimes ask them to bring from town things other than agricultural inputs, such as fish or cement.

Interviews in Vanduzi also revealed informal contract farming in a vibrant local and regional market for fresh vegetables. In Vanduzi, the primary subject for such contracts is cabbage (*repolho*), purchased from producers for MT15/cabbage and sold in Chimoio or Beira for MT 20–25/cabbage in the main season (May–November), but up to MT45/cabbage in the hot season (December–April) when growing conditions are more difficult. Traders advance credit typically of about MT3000 (USD50), which they subtract from payment at harvest. In some cases much larger advances (MT50,000 or USD833) have been reported, to produce crops worth MT260,000 (USD4300).

Cabbage traders range in scale. The largest, with their own trucks, buy about 3500 cabbages a week and supply not only regional wholesale markets, such as Maquinina in Beira and Mercado 38 in Chimoio, but also Machipanda and Zimbabwe. Smaller traders buy around 500–1500 cabbages a week and hire trucks to transport to the urban wholesale markets. The smallest retail traders usually purchase smaller/lower quality produce (MT 2–5/cabbage) by the sackload (40–80 cabbages per sack) for sale (at MT5–10/cabbage) in local retail markets, such as Vanduzi and Messica. Traders harvest the cabbages themselves to check on quality, with the wholesalers having first choice and the retail traders taking what is left.

## 5.2 | Formal contract farming: the Companhia de Vanduzi

The Companhia de Vanduzi has operated in the area since 2004, when it established a “core estate” (under direct company management) with a total area of 1500 ha in Catandica and Chitundu for the production of fresh vegetables (green beans, “baby corn,” and chilli peppers) for export to the United Kingdom.<sup>4</sup> In addition to the company's own production from this core estate, it sought to expand production by contract farming with local small-scale growers, beginning with those in farmers' associations in Vanduzi. In 2017, the company was working with five farmers' associations in Vanduzi, producing on 225 irrigated hectares. In 2014, the scheme was extended to farmers' associations in Messica.

Contracts involve supply of inputs and technical advice for units of 0.2 ha of maize/baby corn, or 0.1 ha of green beans or chillis. Prices are set in advance (MT5/kg for baby corn, MT14/kg for green beans and MT 20–25 for chillis), and input costs are deducted before payment for the harvest. Contracts are available only to members of associations who have permanent access to irrigation. Although similar to the local traders' tomato contracts (supply of inputs on credit in return for exclusive right to purchase the harvest), these contracts are more formal: Individual producers had to be registered as members of a farmers' association and contracts had to be witnessed by association leaders.

The contract farming arrangements for export crops introduced by the Companhia de Vanduzi imposed a greater degree of formality to agricultural production with explicit requirements of farmers having access to irrigation. However, the relationship between the company and its contract farmers was not an easy one. In Messica, producers

<sup>4</sup>The Companhia de Vanduzi started as a sister company to Moçfer Indústrias Alimentares (MIA), which operated a contract farming scheme on paddy rice in Chókwe Irrigation System, Southern Mozambique, as analysed in Veldwisch (2015).

complained they did not receive copies of contracts, prices were low, and baby corn and chilli pepper crops were frequently rejected on grounds of inadequate quality while the company prohibited their sale to alternative buyers. Moreover, farmers accused company staff of not making their concerns known to the company managers. Some farmers continued to produce tomatoes on a small scale to spread their risk, maintaining that tomatoes have a higher profit compared with chilli peppers and baby corn, but the latter have a more guaranteed market.

It is important to note that besides the crops promoted via formal contracts, small-scale irrigators grow a wide variety of crops for local markets, including tomatoes and onion, cassava, banana, beans (*Phaseolus vulgaris*), and sweet potato. This has resulted in a highly intensive use of irrigated land, which, in some instances, is cropped at least twice and sometimes three times per year. Typically, a maize crop grown in the rainy season is followed by a commercial cabbage crop in the dry season. Alternatively, a series of two or three short-season contract crops such as baby corn (3 months) or green beans (2 months) may be grown during the course of a dry season (April–November).

In 2017, the Companhia de Vanduzi withdrew from contracts with farmers in Messica and focused on its own core estate production and contracts with outgrowers in Vanduzi District. This consolidated the much greater integration of Vanduzi into the export-oriented contract farming system and parallels the greater levels of official intervention and investment in formalizing irrigation infrastructure and institutions. However, those irrigating groups in which contract farming (overwhelmingly concerned with export crops baby corn and chilli peppers) was more frequent (Table 2) do not seem to have secured higher returns per hectare compared with those with less involvement. This tends to corroborate the reservations expressed by farmers in interviews about contracts for producing these crops. Finally, Companhia de Vanduzi was sold in March 2018 to a Zimbabwean financial corporation, Takura Capital. This raises questions about possible changes in policy and potential implications for contract farming focused on crops for export, rather than for local/regional urban food markets.

## 6 | FORMAL AND INFORMAL CONTRACTS IN AGRARIAN TRANSFORMATION

We readily acknowledge that the empirical study on which we draw for this paper was not designed to study contract farming, but rather to investigate the processes at work among farmers investing labour and capital in developing irrigated agriculture to take advantage of new market opportunities. However, the occurrence of contract farming, not only in its more conventionally recognized formal “agri-business” manifestation, but also in a parallel informal activity, prompts three areas for discussion. First, it raises the question that such contracts may provide an important mechanism for financing farmers' own investment efforts. Second, it offers an opportunity to consider whether formal or informal variants of contract farming offer advantages relative to the other. Finally, it provides an opportunity to (re)consider the significance of contract farming in processes of agrarian transformation more widely. We consider each of these aspects in turn.

Contract farming does appear to be a critical source of funding to purchase agrochemical inputs and seeds needed to realize the potential gains in crop value obtainable with irrigation. Even though many irrigators involved in farmer-led irrigation development use very simple and low-cost irrigation technologies, like buckets, controlled drainage of wetlands and stream diversions, investment in irrigation almost by definition involves intensification and/or expansion of cropped area. Even if investment costs for water management technology are relatively low, they are invariably accompanied by cash investments for the cropping season, including for fertilizer, seeds, pesticides, mechanization, and/or labour. Small-scale farmers developing their own irrigation are largely dependent on informal networks, both for marketing their produce and for financing their production systems. For the latter, where they do not have a source of off-farm income, farmers mainly make use of informal money borrowing systems such as group saving schemes, rotating credit schemes, informal money lenders in the community, and so forth. A particularly attractive arrangement for farmers is pre-financing of the cropping season by informal traders, on the promise that

the crop will be purchased by the trader. Besides a solution for financing production costs, the output market is also secured and the risk of fluctuating market prices is shared between producer and trader. Informal contract farming may then become an important mechanism in financing farmer-led irrigation development and other forms of agricultural intensification. It thus illustrates the agency of small-scale producers in “real markets” pursuing options for improved productivity and increased incomes.

This reading of the function of contract farming is similar to that of Cole's study (this issue) of traders on the Lao/Vietnam border. There, too, contract farming is seen as a relationship through which traders and producers take advantage of new markets (maize for animal feed manufacture) arising from major shifts in food systems. It is important to note that the more informal versions of contract farming are not always recognized as “contracts.” For example the survey on which we draw for Tables 1 and 2 consistently returned very low numbers of responses indicating crops grown under contract, particularly on sites in Tanzania. Yet interviews with irrigators produce quite a different picture, of which this, from a rice grower in Rukwa—where no crops grown under contract were reported in the household survey—is typical:

[Farmers] get loans to run their farm management from traders under the agreement on returning in terms of crop harvest during harvesting time. However, the agreement on prices is always low compared to the actual prices in [the] market at [...] harvesting time. For example, one farmer reported that he got [a] loan under the agreement on 25,000Tsh per bag of rice instead of 40,000Tsh to 80,000Tsh per bag.

This highlights the importance of looking at the content of “real market” relationships beyond the more visible engagement of larger scale corporate actors.

Informal contract farming offers parallels with the operation of “vernacular land markets” (Chimhowu & Woodhouse, 2006). These perform many of the functions of conventional markets, such as allocating land to those with greater resources with which to exploit it, as well as the attendant socially differentiated consequences, but without recourse to statutory land titles. As with vernacular land markets, the contracts between farmers and traders are market transactions secured by the social relations within which they are embedded. The terms of exchange in such contracts thus reflect the disparities of power and consequent exploitation between those involved in the contracts. This raises the question of whether such informal contract farming arrangements are as exploitative of small-scale farmers as the more formal versions.

With regard to the possible advantages of either formal or informal contract farming arrangements, the preliminary evidence from these case studies does not show clear advantages in terms of productivity or profitability for producers taking informal contracts to grow tomatoes or more formal contracts to grow baby corn. All informal borrowing arrangements build on multifaceted relationships in a networked community and go beyond a mere financial contract. Just as with formal contracts, these informal arrangements can be risky for farmers if they do not achieve the projected harvest (in terms of quantity and/or quality), but for many farmers these relations are more accessible and easier to navigate than formal loans at finance institutions. It is important to recall, however, that our case study data confirms contract farming tends to be concentrated among the wealthier farmers using irrigation, who are actively sought by contracting traders. These informal contract farming arrangements mainly concern crops that have a local market and are traded in large volumes. Farmers thus have ample opportunity for side-selling, though this is of course balanced by the often multi-faceted relations with the finance-providing traders.

It is important to note that both formal and informal contracts have the effect of leaving production risk firmly on the shoulders of the producer, and this, indeed, appears to be a feature of producer-trader arrangements in other contexts, such as those analysed in classic studies in India (Harriss, 1990). The critical importance of the balance of power in determining the distribution of benefits from contract farming is a recurrent theme of other papers in this issue (see Cohen, Vicol, and Pol; Shonhe and Scoones; White and Hanny). The (in)formality of contracts does not per

se affect the balance of power between the parties involved, with local traders being no less capable of exploiting small-scale farmers than corporate agri-business, as exemplified by Nigerian grain traders (Oguoma et al., 2010, cited in Cole, this issue), and indeed rice traders referred to above by interviewees in our own research.

In the cases we investigated in central Mozambique, contract farming concerned perishable crops of vegetables and this reduces the scope for traders and other market intermediaries to hoard stocks in order to maximize trading margins. In this respect, the timing of purchase and sale may be equally critical to both producer and buyer. However, corporate contracting for vegetables for export offers fewer opportunities for side-selling as there is only a single buyer and this significantly reduces the producers' relative power in the contract. In this sense the formal contracts for export crops tend more to the classic labour relationship mapped by Little and Watts. Nonetheless, the widespread use of informal farmer-trader contracts by small-scale irrigators suggests that the problematic nature of such formal contracts should not obscure the importance of other forms of contract farming operated in “real markets.” This suggests that questions about the negative aspects of contract farming need to focus on particular types of market structure (export via large corporate intermediaries exercising monopoly control), rather than on the principles of contracts per se.

Oya, in his 2012 review, suggests that the relatively limited reach of contract farming in the overall rural population meant that its impact on agrarian change might be quite restricted, unless it accentuated other processes of change already underway. It is therefore significant that both informal contract farming promoted by local traders and formal contract farming by the Companhia de Vanduzi targeted local communities in which farmers had already started irrigating. In the case of the Companhia de Vanduzi, farmers were recruited to grow export crops with the promise of modern technologies and a secure market outlet. Most farmers only cropped a part of their irrigated area in contract to the company while on the rest continued their existing mix of irrigated output for sale in local markets. A similar pattern is observed also in the Kenyan cases of French bean production (Thotoli et al., 2019) and in the supermarket contracts described for Zimbabwe farmers (Scoones et al., 2019). In each case, farmers' irrigation practices predated their contracts with the companies. Companies contracting producers seem to search for farmers that have already started irrigating by themselves in order to benefit from their investments and access to irrigation, which provides an important guarantee for a good harvest. Contract farming, be it formal or informal, may accentuate the advantages of households with the means to develop irrigation and thus likely reinforces local processes of socio-economic differentiation and accumulation of wealth.

## 7 | CONCLUSION

In this paper we have extended the scope of “contract farming” beyond the formal contracts between commercial corporate entities and small-scale producers to include less formal credit agreements with traders. We think this is justified because the latter illustrate that the proposed benefits of contract farming (access to markets, technology, and credit) do appear to underpin the widespread use of traders' credit by small-scale irrigators. Following Poulton et al. (1998), this places contract farming on a continuum of arrangements through which small-scale producers may seek to gain access to inputs needed for intensification of production. They also accentuate, and possibly accelerate, processes of socio-economic differentiation, as suggested by the preferential recruitment of those with their own irrigation capacity. We recall the key question posed by Oya (2012) about the significance of contract farming to wider processes of agrarian change in Africa. While leaving open the question, Oya observed that contract farming—as pursued by agri-business companies—was not sufficiently extensive to act as a dominant force driving socio-economic differentiation but it “may be contributing to processes of social differentiation and capitalist development *already* under way, in conjunction with several other forces, specific to time and place” (2012, p. 28, italics in the original). However, the possibility that informal contracts may be widespread between traders and farmers intensifying production, as in the instances where farmers develop irrigation, suggests that the role of contract farming in agrarian transformation in Africa is more widespread than previously thought. Informal contract farming may

therefore be amplifying the pace and spread of socially differentiated agricultural intensification, in ways that merit further research, particularly in the many areas witnessing impact of farmer-led irrigation development, but possibly also beyond.

## ACKNOWLEDGEMENTS

This paper was written as part of a collaborative project ([www.safi-research.org](http://www.safi-research.org)) funded by the UK Department for International Development (DFID) and the UK Economic and Social Research Council (ESRC) through the DFID-ESRC Growth Research Programme (DEGRP) (grant number ES/L012391/1). The findings and conclusions contained in the article are those of the authors and do not necessarily reflect positions or policies of the UK Government, DFID, or ESRC.

## DATA AVAILABILITY STATEMENT

Data are available on request from the authors.

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## REFERENCES

- Abebe, G. K., Bijman, J., Kemp, R., Omta, O., & Tsegaye, A. (2013). Contract farming configuration: Smallholders' preferences for contract design attributes. *Food Policy*, 40, 14–24. <https://doi.org/10.1016/j.foodpol.2013.01.002>
- Adams, W. M., & Anderson, D. (1988). Irrigation before development: Indigenous and induced change in agricultural water management in East Africa. *African Affairs*, 87, 519–535. <https://doi.org/10.1093/oxfordjournals.afraf.a098088>
- Beekman, W., & Veldwisch, G. J. (2016). Supporting farmer-led irrigation in Mozambique: Reflections on field-testing a new design approach. *Sustainability*, 8(6), 580. <https://doi.org/10.3390/su8060580>
- 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. <https://doi.org/10.1016/j.pce.2014.10.002>
- Bernstein, H., & Oya, C. (2014). *Rural futures: How much should markets rule?* IIED Working Paper. IIED.
- Billig, M. (2013). *Learning to write badly: How to succeed in the social sciences* (p. 244). Cambridge: Cambridge University Press.
- Bolding, A., Post Uiterweer, N., & Schippers, J. (2010). The fluid nature of hydraulic property: A case study of Mukudu, Maira and Penha Longa irrigation furrows in the upper Revuê River, Manica District, Mozambique. In P. Van der Zaag (Ed.), *What role of law in promoting and protecting the productive uses of water by smallholder farmers in Mozambique?*. Challenge Program Project No. 66. (pp. 105–136). UNESCO-IHE Institute for Water Education.
- Bolding, J. A., & Piloto, R. L. (2013). Reversing the Flows of People, Skills and Goods. Rural Livelihood changes in central Mozambique. In *In the Shadow of a Conflict. Crisis in Zimbabwe and its effects in Mozambique, South Africa and Zambia* (pp. 121–145). Weaver Press.
- Cai, X., Magidi, J., Nhamo, L., & van Koppen, B. (2017). *Mapping irrigated areas in the Limpopo Province, South Africa*. IWMI Research Report No. 172. International Water Management Institute.
- Chimhowu, A., & Woodhouse, P. (2006). Customary vs private property rights? Dynamics and trajectories of vernacular land markets in sub-Saharan Africa. *Journal of Agrarian Change*, 6, 346–371. <https://doi.org/10.1111/j.1471-0366.2006.00125.x>
- 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. <https://doi.org/10.1016/j.worlddev.2018.11.018>
- 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(1), 107–128.
- De Bont, C., & Veldwisch, G. J. (2020). State engagement with farmer-led irrigation development: Symbolic irrigation modernisation and disturbed development trajectories in Tanzania. *The Journal of Development Studies*, 56(12), 2154–2168. <https://doi.org/10.1080/00220388.2020.1746278>
- Gross, B., & Jaubert, R. (2019). Vegetable gardening in Burkina Faso: Drip irrigation, agroecological farming and the diversity of smallholders. *Water Alternatives*, 12, 46–67.
- Hall, R. (2011). Land grabbing in southern Africa: The many faces of the investor rush. *Review of African Political Economy*, 38(128), 193–214. <https://doi.org/10.1080/03056244.2011.582753>



- Hall, R., Edelman, M., Borras, S. M. Jr., Scoones, I., White, B., & Wolford, W. (2015). Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions 'from below'. *Journal of Peasant Studies*, 42(3–4), 467–488. <https://doi.org/10.1080/03066150.2015.1036746>
- Hall, R., Scoones, I., & Tsikata, D. (2017). Plantations, outgrowers and commercial farming in Africa: Agricultural commercialisation and implications for agrarian change. *The Journal of Peasant Studies*, 44(3), 515–537. <https://doi.org/10.1080/03066150.2016.1263187>
- Harrison, E., & Mdee, A. (2017). Successful small-scale irrigation or environmental destruction? The political ecology of competing claims on water in the Uluguru Mountains, Tanzania. *Journal of Political Ecology*, 24, 406–424. <https://doi.org/10.2458/v24i1.20881>
- Harriss, B. (1990). Another awkward class: Merchants and agrarian change in India. In H. Bernstein, B. Crow, M. Mackintosh, & C. Martin (Eds.), *The Food Question. Profits versus People?*. Earthscan.
- Hebinck, P. G. M., Bosma, L., & Veldwisch, G. J. A. (2019). Petrol pumps and the making of modernity along the shores of Lake Victoria, Kenya. *Water Alternatives*, 12, 13–29.
- Izzi, G., Denison, J., & Veldwisch, G. J. (2021). *The farmer-led irrigation development guide: A what, why and how-to for intervention design*. World Bank.
- Lankford, B., & Wiggins, S. (2019). Farmer-led irrigation in sub-Saharan Africa: Synthesis of current understandings. Synthesis Report, DFID-ESRC Growth Research Programme (DEGRP). <https://degrp.odii.org/publication/farmer-led-irrigation-in-sub-saharan-africa-synthesis-of-current-understandings/>
- Little, P. D., & Watts, M. (Eds.) (1994). *Living under contract: Contract farming and agrarian transformation in sub-Saharan Africa*. University of Wisconsin Press.
- McMichael, P. (2013). Value-chain agriculture and debt relations: Contradictory outcomes. *Third World Quarterly*, 34, 671–690. <https://doi.org/10.1080/01436597.2013.786290>
- Mehta, L., Veldwisch, G. J., & Franco, J. (2012). Introduction to the special issue: Water grabbing? Focus on the (re) appropriation of finite water resources. *Water Alternatives*, 5, 193–207.
- Nkoka, F., Veldwisch, G. J., & Bolding, A. (2014). Organisational modalities of farmer-led irrigation development in Tsangano District, Mozambique. *Water Alternatives*, 7, 414–433.
- Oguoma, O., Nkwocha, V. I., & Ibeawuchi, I. I. (2010). Implications of middlemen in the supply chain of agricultural products. *Journal of Agriculture and Social Research*, 10(2), 77–83.
- Oya, C. (2012). Contract farming in sub-Saharan Africa: A survey of approaches, debates and issues. *Journal of Agrarian Change*, 12, 1–33. <https://doi.org/10.1111/j.1471-0366.2011.00337.x>
- Peluso, N. L., & Lund, C. (2011). New frontiers of land control: Introduction. *Journal of peasant studies*, 38(4), 667–681.
- Poulton, C., Dorward, A., & Kydd, J. (1998). The revival of smallholder cash crops in Africa: Public and private roles in the provision of finance. *Journal of International Development*, 10(1), 85–103. [https://doi.org/10.1002/\(SICI\)1099-1328\(199801\)10:1<85::AID-JID502>3.0.CO;2-V](https://doi.org/10.1002/(SICI)1099-1328(199801)10:1<85::AID-JID502>3.0.CO;2-V)
- Scoones, I., Murimbarimba, F., & Mahenehene, J. (2019). Irrigating Zimbabwe after land reform: The potential of farmer-led systems. *Water Alternatives*, 12, 88–106.
- Thotoli, V., Zevenbergen, H., & van Veldhuizen, L. (2019). *Platforms for brokering and learning: Lessons on multi-stakeholder collaboration for farmer-led irrigation development*. SWA Kenya, SNV Netherlands Development Organisation.
- Van den Pol, B. (2012). 'Hot Tomatoes': Smallholder business strategies, market opportunities and irrigation system dynamics in Messica, Central Mozambique [MSc Thesis]. Irrigation and Water Engineering Group, Wageningen University.
- Veldwisch, G. J. (2015). Contract farming and the reorganisation of agricultural production within the Chókwe Irrigation System, Mozambique. *The Journal of Peasant Studies*, 42, 1003–1028. <https://doi.org/10.1080/03066150.2014.991722>
- 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), 1–12.
- Venot, J. P., Bowers, S., Brockington, D., Komakech, H., Ryan, C. M., Veldwisch, G. J., & Woodhouse, P. (2021). Below the radar: Data, narratives and the politics of irrigation in sub-Saharan Africa. *Water Alternatives*, 14(2), 546–572.
- Vermeulen, S., & Cotula, L. (2010). *Making the most of agricultural investment: A survey of business models that provide opportunities for smallholders*. IIED.
- Vorley, B., del Pozo-Vergnes, E., & Barnett, A. (2012). *Small producer agency in the globalised market: Making choices in a changing world*. IIED.
- Weemstra, H., Oord, A. L., de Boer, F. S., & Beekman, P. W. (2014). Baseflow prediction in a data-scarce catchment with Inselberg topography, Central Mozambique. *Physics and Chemistry of the Earth, Parts A/B/C*, 76, 16–27. <https://doi.org/10.1016/j.pce.2014.09.005>
- White, B., Borras, S. M. Jr., Hall, R., Scoones, I., & Wolford, W. (2012). The new enclosures: Critical perspectives on corporate land deals. *Journal of Peasant Studies*, 39, 619–647. <https://doi.org/10.1080/03066150.2012.691879>
- Woodhouse, P. (2012). Foreign agricultural land acquisition and the visibility of water resource impacts in sub-Saharan Africa. *Water Alternatives*, 5, 208–222.



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. <https://doi.org/10.1080/03066150.2016.1219719>

**How to cite this article:** Veldwisch, G. J., & Woodhouse, P. (2021). Formal and informal contract farming in Mozambique: Socially embedded relations of agricultural intensification. *Journal of Agrarian Change*, 1–17. <https://doi.org/10.1111/joac.12461>