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Contract farming and the reorganisation of agricultural production within the Chókwè Irrigation System, Mozambique

Gert Jan Veldwisch

This paper contributes to the discussion about ‘inclusive business models’ as alternatives to large-scale land acquisitions by analysing a case in which a foreign agribusiness investor, within an impact investment paradigm, acquired and rehabilitated a rice processing plant in Chókwè, Mozambique. A contract farming programme drawn up to source raw produce for the factory led to radical shifts in control over land and water resources. The case is set against the background of a large-scale irrigation system that has played an important role in national agricultural policies since colonial times. The private sector-led development approach is strongly supported by the state which portrays it as an opportunity to reduce its dependency on rice imports. The investor redirected the benefits of land and water use through taking a role of coordination and control within the irrigated production system.

The ensuing rural transformation reminds one of earlier periods in the development of the irrigation system: the central control over production, and the very high level of agricultural inputs and mechanisation, remind one of the state socialist period, while the removal of smallholders from their land and its concentration in the hands of a few bears a strong resemblance to the scheme’s establishment under colonial rule.

Keywords: contract farming; irrigation; Mozambique; land grabbing; water grabbing; rice

1. Introduction

This contribution presents an analysis of the effects of a contract farming scheme on the organisation of agricultural production, and the changing control over the benefits of land and water use.1 The analysis aims to contribute to the discussion about ‘inclusive business models’ as alternatives to large-scale land acquisitions, and shows that the way in which the integrative linkages are crafted has more transformative effects than the adoption of an ‘inclusive business model’ per se.

In 2005, a large British-funded agribusiness investor, Moçfer Industrias Alimentares (MIA), acquired a long-established rice processing facility at the centre of the Chókwè Irrigation System (CIS), the largest irrigation scheme in Mozambique, which covers an area of 26,000 ha.2 The company adopted an ‘impact investment approach’, implying that it aimed to reduce poverty and was not looking for quick profits. This model is

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1 An earlier version of this paper was published in Spanish as Veldwisch (2012).
2 The system is located about 200 km northeast of Maputo. The scheme takes its water from the Limpopo River at the Macarretane diversion weir, where water enters the canal system by gravity.
gaining support both in the private sector and among financers of more classical rural development projects. The government of Mozambique actively facilitated MIA’s activities as these were aligned with its strategy to increase domestic rice production and to reduce dependency on rice imports. It hoped to re-establish CIS as the ‘bread basket of the nation’. ³ To meet the factory’s demand for raw produce, MIA initiated a contract farming programme that for 3 consecutive years would radically change the organisation of agricultural production. After a very poor season in 2010/2011, which apparently left almost all of its contract farmers in debt, MIA dismantled its contract farming programme in favour of engagement with the family sector (Van der Struijk 2013). In 2013, MIA completely ceased its operations in Chókwè following flooding of the Limpopo River, which critically damaged the irrigation system and the company’s processing facilities. These later developments are beyond the scope of this contribution, which focuses on the contract farming period and its reorganisation of production, while paying some attention to the reason for the failure of the business model.

Since 2008, large-scale land acquisitions have become a hot issue, with activists and critical scholars challenging the ethics of what has become known as ‘land grabbing’ (see, for instance, Borras et al. 2011, 2012; White et al. 2012) and associated ‘water grabbing’ (Mehta, Veldwisch, and Franco 2012). Though useful in attracting media and policy attention, these terms obscure the fact that these large-scale land acquisitions are only the tip of the iceberg of a much wider and deeper process of transformation driven by the further enrolment of agricultural production in the global economy. A number of recent contributions to the global land grabbing debate urge looking beyond the strict land-based deals and focusing on a wider range of investment models, some of which could be attractive for the host countries (Vermeulen and Cotula 2010). This is partly because such models are already taking place at a large scale (Hall 2011), and because, from an analytical perspective, both the drivers and the process of agrarian transformation are very similar (Li 2011; White et al. 2012). At the same time, there is a drive to open up the land grabbing debate and to re-engage with the broader questions of agrarian transformation (see Oya 2013).

Following Hall (2011), White et al. (2012) demonstrate that besides the more visible land acquisitions, there are other business models, such as outgrowers and in situ commercialisation of smallholder production, which can be seen as examples of the same wider global process, even though these ‘do not necessarily result in dispossession of local cultivators or changes in the forms of their access to land’ (White et al. 2012, 634). Vermeulen and Cotula (2010, 3) analyse some of these ‘inclusive business models’, identifying contract farming, share cropping and joint ventures as possible alternatives to large-scale land acquisitions.

This paper analyses an example of such an alternative business model. According to Osterwalder and Pigneur (2010, 14), a business model ‘describes the rationale of how an organisation creates, delivers, and captures value’. In this sense it ‘is more or less the business-studies and business consultants’ equivalent’ of what in agrarian studies is called the ‘production’ or ‘labour regime’ (White et al. 2012, 633). The ‘labour process approach’ studies the ‘forces of production’, the ‘relations of production’ and the way surplus appropriation takes place (Burawoy 1985; Braverman 1974; Edwards 1979).

³The terminology is part of the government’s discourse and rhetoric to show its continued commitment to make the irrigation system ‘work’ and dates back to the Third FRELIMO (Frente de Libertação de Moçambique) Congress in 1977 (Pellizzoli 2010a, 2010b); see section 2 of this paper.
Business models thus have strong parallels to ‘forms of production’ (Veldwisch and Spoor 2008), each with its typical organisation of the internal and external relations of production (Burawoy 1985), including the distribution of, access to and control over land, water, labour, finance, markets and technologies. In this paper, the term ‘business model’ refers to the rationale of the organisation of the relations of production, including the distribution of burdens and benefits amongst the different actors involved.

A defining feature of all these business models that are considered alternatives to large-scale land acquisition is that the agribusiness investors engage with already-established small- and medium-sized producers and enterprises, and the value added is shared with these local actors (which is why these models are referred to as ‘inclusive’). However, the extent to which, and the ways in which, they are inclusive vary. Vermeulen and Cotula (2010) assess this by looking at issues of ownership, voice, risk and reward.

While these arrangements have the sharing of value with local actors in common, their content varies in almost every other respect. Hall (2011) argues that to better understand the diversity and scope of these transformation processes, we should study the different types of deals along 12 different dimensions:

1. the size, 2. duration and 3. source of the investments; 4. the commodities and 5. the business models through which they are implemented; 6. the tenure arrangements and 7. resources accessed; 8. the terms of leases and compensation; 9. the degree of displacement; 10. labour regimes and employment creation; and changes in 11. settlement and 12. infrastructure. (202–03)

In this analysis, MIA’s business model in Chókwè is an outgrower/contract farming business model [6] focused on rice production for import substitution [4] with ‘impact investment’ as the source of capital [3] that accesses irrigated land [7]. The remaining eight dimensions are used in the case study to capture the implications of the investment in more detail. In the discussion and conclusion, I analyse how the investment and its contract farming programme can be seen as the building of a ‘production network’ in which the 12 dimensions are meaningfully integrated to make the irrigated production system into a ‘working whole’ (Veldwisch, Bolding, and Wester 2009). These ‘integrative linkages’ give shape to the logic of the organisation of the internal and external relations of production – in other words, the rationale of the business model.

Rural transformation does not happen in an historical void. Since the establishment of the CIS in the early 1950s, its agricultural production has played an important role in national agro-economic policies and politics. Despite local particularities, its development history largely reflects the different phases of Mozambique’s political and economic development. These phases can loosely be distinguished as (1) the colonial period, (2) the early state socialist period, (3) early reforms and (4) multi-party democracy and further privatisation. Each of these involved a different organisation of production, had a different engagement with technologies and labour and was based on different perceptions of the role of large-scale rice production in the national economy. As Mosca (1996) points out, none of these phases completely changed the local social relations and the relations of production, but each phase left its mark on the irrigated production system, some in the form of social patterns, others inscribed in the technology and landscape. Section 2 of this contribution provides an historical analysis of the organisation of production at CIS.

Section 3 examines MIA, the agribusiness investor, its approach and the contract farming programme it implemented. The challenge of sourcing sufficient rice to run the rice processing factory is discussed, followed by a detailed description of the contract
farming arrangements that MIA established. It is explained how these arrangements led to
the concentration of control over land and water at two different levels and also led to a
marked increase in rice production.

Fieldwork for this paper was conducted by the author in November 2008, March 2010
and November 2011. The methodology consisted of a combination of direct observations
during field visits and semi-structured interviews with key informants, which, whenever
possible, were conducted in a field setting.

2. The history of the Chókwè Irrigation System

This section presents an analysis of the historical organisation of agricultural production at
CIS, and its relation to the national agro-economic policies and politics during four periods
of development: (1) the colonial period, in which agricultural production was organised
through medium-sized private settler farmers, partially with forced labour, to provide
surplus to the urban centres; (2) the early state socialist period, when labour, ownership
and production control were centralised under larger state-operated production units; (3)
early reforms that maintained crucial aspects of state-organised production, such as high
reliance on agrochemical inputs, while also introducing market forces, particularly
visible in the re-installation of medium-sized private farms alongside state farms; and (4)
multi-party democracy and further privatisation through which agricultural production pro-
cesses became thoroughly privatised, including the functions of input provision, processing
and marketing.

2.1. Medium-sized private settler farms under colonial rule

CIS is a large-scale open canal irrigation system for monoculture rice production, devel-
oped under Portuguese colonial rule in the early 1950s as the ‘Colonato do Limpopo’.

The growing population of Portuguese settlers (colonos) and the first urban centres
created a demand for food products that were not traditionally grown by peasants, including
rice, vegetables, fruits and livestock. The policy of taxing the rural population served to
monetise the peasant economy and thereby mobilise the flow of agricultural produce to
urban centres and of labour to plantations. Both aimed at modernising the economy,
with the local population providing a supply of cheap food and household goods. This
also implied a deliberate state policy to under-develop local rural economies (Mosca
1996, 18).

Portuguese colonisers evicted Mozambican families from the land, including the very
fertile Limpopo valley, to make space for colonos (West and Meyers 1996; Mosca
1996). In southern Mozambique, the goal was to produce food for the internal market
(Wuyts 1981). In other areas, peasants were forced to grow rice and sell all of their pro-
duction at set prices to the colonisers (Mangezi 1983). Around Chókwè, there were very
limited possibilities for a group of assimilados to use small parts of inferior land in the
settlement areas. Hermele (1988) shows that conflicts over access to irrigated land
emerged immediately after the confiscation of the land by the colonos and continued to
be a source of conflict throughout the decades that followed, although this conflict took

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4See Amilai (2008, 67–73) for details on the design and construction period.

5A second-class Portuguese citizenship for Mozambicans, who received special education and
adopted Portuguese language and customs.
different forms over time. From 1959 onwards, some Mozambicans were allowed the full status of settlers and received state support, but the majority would still only be allowed an insecure, ‘probationary’ status.

Southern Mozambique, especially Gaza province, has since been heavily influenced by labour out-migration to the South African mines, which started as early as the end of the nineteenth century (Manghezi 1983; Wardman 1985). In the 1960s, this was further stimulated when the Portuguese colonial government agreed to assist with recruiting Mozambican labour for the South African mines in exchange for South African development support (Mosca 1996). The numbers of out-migrants from southern Mozambique continued to rise until 1970, when 20 percent of all men (Wardman 1985), or 30–35 percent of the economically active male population (Mosca 1996), were involved. The salaries earned in South Africa were used to buy consumer goods and agricultural implements (Wardman 1985). The ‘organic linkages’ between peasant production and off-farm employment have historically played (Wuyts 2001) and continue to play (O’Laughlin 2009) an important role in the structuring of Chókwè’s rural economy. Since the establishment of CIS, the peasants living here have been seen as a labour reserve for intensive agricultural production within the boundaries of the scheme, although this role has been in competition with (and undervalued in comparison to) migrant labour opportunities and household production. The value of the salaries earned in South African mines was more than 10 times the value of all agricultural produce sold in Gaza Province (Wuyts 1978 in Wardman 1985). Settlers around Chókwè could not compete with the salaries paid by the mines and, in response, reverted to forced labour, which continued until the early 1970s (Wardman 1985).

By 1974, almost 16,000 ha of the planned 30,000–35,000 ha were brought under irrigated cultivation, divided unequally between Portuguese settlers, Mozambican settlers and Mozambicans on probation (see Table 1). Further development of the CIS was cut short by Mozambique attaining independence in 1975. The maximum production achieved in this period was reportedly 60,000 tons of rice (Hermele 1988, 36). A single organisation, the Brigada Técnica de Fomento e Povoamento do Limpopo (BTFPL), with overall authority to decide on land distribution, agricultural planning and setting prices, was responsible for the irrigation system and its production (Chilundo, Munguambe, and Namagina 2012). Right from the beginning, the main produce was rice, though there was also some horticulture and livestock production in the area (Wardman 1985; Bowen 1989; Amilai 2008; Chilundo et al. 2012).

Section 3 shows how MIA’s contract farming programme, which started in 2007, led to a very similar expulsion of smallholders, a consolidation of land into larger production units (about 16 ha each) and a re-focus on private-sector production.

2.2. Industrial agricultural production in large state-operated farms

In the transition period from a colony to an independent country (roughly 1974–1977), dramatic changes took place in the agrarian structure, with most Portuguese settlers leaving the Colonato (261 in 1975, and about 400 in 1976 and again in 1977). Some 4500 peasants were allocated land in the CIS, and another 10,000 peasants made a claim for access to irrigated land (Hermele 1988). The collapse of colonial structures more or less coincided with a sharp decrease in demand for Mozambican labour in South Africa, leading to a sharp decrease in wage incomes, which used to partially be invested into

6Also called chibalo.
peasant agriculture. The period was further characterised by one-party rule by FRELIMO (Frente de Libertação de Moçambique), the independence movement that transformed itself into a socialist party. A civil war ensued with RENAMO (Resistência Nacional Moçambicana), a rebel movement supported by South Africa and Rhodesia (now Zimbabwe), both still under white-minority rule and fearing Mozambican political influence on independence and reformist movement in their countries.

During the third FRELIMO congress, which took place in 1977, the party adopted a Marxist–Leninist identity, and a policy that marked a transition to collective and state agriculture (Roesch 1988; Mosca 1996; Amilai 2008). In 3–4 years, communal villages were introduced throughout the country, after which 40 percent of the rural population lived in villages. In the early years, these communal villages were much appreciated for introducing literacy programmes, establishing schools and health posts and improving access to clean drinking water (Mosca 1996).

Also in 1977, the Chókwè area was covered by severe floods which led to the evacuation of its population and the destruction of its basic infrastructure. The government used the situation to accelerate its policies of establishing collective villages and state farms (Hermele 1988; Amilai 2008). The population was resettled into communal villages, while peasants who only partially used their land were allocated smaller plots. At the same time, large groups of peasants completely lost access to land – a move that ignited resistance, but was pushed through anyway (Hermele 1988). Meanwhile, the Colonato was completely re-organised into a single state-socialist enterprise: the Complexo Agro-Industrial de Limpopo (CAIL), the largest state farm in Mozambique (Wardman 1985, 297). The creation of CAIL involved a single state organisation taking full control of all agricultural activities within the boundaries of the irrigation system, with the exception of managing the canal system, which was brought under the control of an organisation named Sistema de Regadio Eduardo Mondlane (SIREMO) (Amilai 2008, 75). Despite a general focus on export agriculture during this period (Wuyts 2001), Chókwè also played an important role in national agricultural policies and, in 1977, the irrigation system was for the first time ‘officially designated as the breadbasket of the nation’ (Hermele 1988, 36).

Mosca (1996) describes the organisation of production on the state farm as showing a strong continuation from the colonial period, which was intensified through capital investment and especially mechanisation. Hermele (1988) also reports very high levels of

### Table 1. Land distribution in the Chókwè Irrigation System (CIS) in 1974.

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>Area (ha)</th>
<th>Average land holding (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portuguese settlers</td>
<td>968</td>
<td>8273</td>
<td>8.5</td>
</tr>
<tr>
<td>Mozambican settlers</td>
<td>412</td>
<td>2448</td>
<td>5.9</td>
</tr>
<tr>
<td>Mozambicans ‘on probation’</td>
<td>2584</td>
<td>5168</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3964</td>
<td>15,889</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: adapted from Hermele (1988, 44).

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7The designation ‘complexo agro-industrial’ (CAI) is a specific category of state farms with an organisation based on that of Soviet sovkhozes and with similar organisational structure to the agro-industrial complexes in certain socialist countries in Europe. Together with the state enterprises producing for export, the CAIs were generally considered more important than other state farms and were under the direct control of the Board of Ministers (Mosca 1996, 25–26).
mechanisation, including pesticide spraying with airplanes. Foreign technical assistance
was mobilised through connections with other socialist countries, and financial resources
were made available to the farms, which were tasked with realising production targets allo-
cated to them from above through annual and multi-annual plans. Military-like obedience
was often demanded in the management of these farms, representing a continuation and
extension of the authoritarian methods of the colonial era (Mosca 1996).

In this period, the state (erroneously) perceived peasants as having a labour surplus and
not being involved in commercial activities (Wuyts 2001). Peasant production was also
seen as a pre-capitalist form of production and peasants as being incapable of adopting
modern technologies, economically traditional and politically conservative (Mosca
1996). The collective villages established after 1977 were supposed to provide labour to
CAIL, but the peasants largely refused to do this and demanded their own plots within
the scheme. Hermele (1988) notes the similarities to the forced mobilisation of labour in
the colonial period. Peasants only received state support when they were linked to a social-
ist form of production, such as the collective villages, while markets continued to be
dictated by the state which skimmed off the surplus value of peasant production by
keeping prices for their produce artificially low (Mosca 1996). This is particularly ironic
for a government with the ‘objective of protecting agrarian communities from the exploi-
tative aspects of market economics’ (West and Myer 1996, 47).

Amilai (2008) notes that there was a continuous and accelerated decline in production at
CIS from 1974/1975 onwards.8 This reached a crisis point in the 1980/1981 growing season
(Hermele 1986 in Amilai 2008; Bowen 1989), and marked the start of a number of reforms
away from collective and state farming that would continue over more than a decade.

Section 3 shows how MIA’s contract farming programme can be seen as a return to the
central coordination and control over agricultural production that was practised in the early
state-socialist period. The very high level of agrichemical inputs, the advanced mechaniza-

tion of production and dependence on foreign expertise are elements that would reappear
in MIA’s business model.

2.3. Re-installation of medium-sized private farms alongside state production

The failures of CAIL can be seen as a precursor to reforms in the Chókwè area, but these
reforms also paralleled reforms at the national level. Central planning ended after FRELI-
MO’s 4th congress, in 1984, at which it completely abandoned Marxism–Leninism (Wuyts
2001; Mosca 1996) and changed its focus to smallholders and co-operative agriculture
civil war contributed to this shift in policy, with the government coming under pressure
to engage with the smallholder sector. The adopted reforms led to four different sectors
existing next to each other: private farms, the family sector, co-operatives and state
farms (Wardman 1985). There were important linkages and co-dependencies between
these sectors that created a fragile balance (Hermele 1988).

In 1983, CAIL was divided into 10 smaller state enterprises, each with an area of
approximately 1–2000 ha (Hermele 1988; West and Myers 1996). These continued their
highly mechanised form of production with foreign technical assistance, but performed
very poorly, with the cost of production being almost 3 times higher than the value of

8For Mozambique as a whole, there was an indexed decline for marketed rice from 100 in 1975 to
79.9, 46.4 and 30.7 for 1976, 1980 and 1981 respectively (Mosca 1996).
production (Wardman 1985). Many of these state enterprises were soon dissolved, with the land within CIS being increasingly privatised. By 1986, 14,000 peasant farmers had received between 0.5 and 1 ha each (Bowen 1989). By 1990, all the state farms had been dismantled, followed by a chaotic land distribution process in which large areas of the best land, up to 16 ha, were given to the private sector. In some instances, land distribution occurred several times, with previously allocated land being reallocated, and a lack of written title deeds. The result was highly insecure land tenure with mounting conflicts and poor long-term management of the soil and water infrastructure (West and Myers 1996).

In the early years of independence, cooperative farms were set up throughout the country, but with little success in the Chókwè area (Wardman 1985). With the dismantling of state farms, cooperatives were (re)established at a larger scale, reaching a total of 14, covering a total area of 1500 ha, by 1985 (Bowen 1989). The form of production resembled that of the neighbouring state farms: irrigated, highly mechanised and with a high reliance on industrial inputs (pesticides, fertilisers and improved seeds). Labour on the collective plots was organised through work brigades, but this proved troublesome as many people joined the cooperatives solely to access an individual plot and cultivate it with support from the cooperative (Wardman 1985).

In 1986, some 436 private farmers occupied 4600 ha with an average of some 10.5 ha each. These farmers were obliged to follow the agricultural planning for the irrigation system and had contracts with the government that stipulated production targets and the percentage of the total yield to be sold to the state, which ranged from 40 to 95 percent, depending on the area cultivated (Bowen 1989). Production of marketed rice grew substantially after the redistribution of land: Bowen (1989) attributes this mainly to a higher yield under peasant production, though it is likely that this was also due to an increase in cultivated area.

The co-existence of different forms of production within the boundaries of the irrigation scheme, and the highly insecure land tenure situation that followed from these reforms, remained in place until quite recently. MIA’s contract farming programme would make use of both, as described in section 3.

2.4. Privatised agricultural production and agricultural services

The peace treaty of 1992 and the following political democratisation and economic liberalisation gave a new impetus to Mozambique’s economic development. This period can be characterised by large-scale international economic collaboration and a further restructuring towards market economic principles under the guidance of the Bretton Woods institutes (Amilai 2008). In 1993, Chókwè’s cooperatives were transformed into farmers’ associations (Vala 2002 in Pellizzoli 2008). Thus, in this period, three sectors were left: the company sector (which replaced the former state sector) with 40–400 ha farms, the private sector with farm sizes of 4–40 ha and the family sector (farms up to 4 ha).

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9Eventually, all 10 state farms went bankrupt (West and Myers 1996).
10Many households cultivated much more than 1 ha, as these areas were allocated to individuals rather than households.
11Rice production grew to 12,000 tons in 1982–3, 16,000 tons in 1983–4, 28,000 tons in 1984–5, 42,000 tons in 1985–6, and an estimated 50,000 tons in 1986–7’ (Bowen 1989, 367).
12Hermele (1986, cited in Amilai 2008) reports that in the 1984–1985 season, there was a cultivated rice area of 8150 ha with an average yield of 3.4 t/ha and a total production of 28,015 tons.
In 1994/1995, part of the land was returned to the ex-assimilados who had occupied the land prior to independence. Each received an area similar to what they had occupied before (Chilundo, Munguambe, and Namagina 2012). In 1997, Water User Associations (Associações dos Regantes, WUAs) were established around hydraulic units, mostly at the level of the secondary canal (or Distribuidor). WUAs were made responsible for water distribution and the maintenance of the irrigation infrastructure from the secondary canals downwards. SIREMO was replaced by Hidráulica de Chókwè Empresa Pública (Hydraulics of Chókwè Public Company, HICEP) following a reform that included the selling of the old buildings, a reduction in the number of staff and the transfer of management responsibility to the WUAs. HICEP remained responsible for water distribution and maintenance of just the primary infrastructure. HICEP’s attempt to dissolve the farmers’ associations met with opposition from the farmers, who wanted the associations to become members of the new WUAs rather than becoming members individually, in order to minimise the risk of being expelled if they were unable to pay the water fee (Pellizoli 2008).

In 2000, extreme flooding of the Limpopo River destroyed large parts of the irrigation infrastructure.13 With the help of donors, the rehabilitation of the intake and the main canal was prioritised, and completed in 2006 (HICEP 2010). Rehabilitation of secondary and tertiary canals followed and, by 2010, an area of about 7000 ha was completed. In 2010–2011, an additional 7000 ha were in the process of being rehabilitated with funding from the Islamic Development Bank (HICEP 2010).

To conclude this section, I focus on the socio-economic characteristics of smallholder farmers in CIS during the early years of the millennium, as this gives a good picture of the situation in which MIA would start its investments.

Chilundo, Munguambe, and Namagina (2012) present HICEP data indicating that in 2003, the total allocated area was 21,469 ha with the company sector occupying 26 percent, the private sector 27 percent and the family sector 46 percent of the total area (see Table 2). In the period 2001–2006, a maximum of about 3000 ha was being used for rice production (HICEP 2010; Chilundo, Munguambe, and Namagina 2012). A combination of constraints led to this low utilisation of the irrigation scheme, as highlighted in a number of reports and publications covering this period (ACI 2005; Kajisa and Payongyong 2008; Brito et al. 2009; Nhantumbo 2009; Munguambe et al. 2009; Pellizzoli 2010a; Chilundo, Munguambe, and Namagina 2012). These included the poor state of the infrastructure, very limited access to (quality) seeds and fertilisers, lack of financial resources for investment in capital-intensive seasonal production, unreliable markets (with fluctuating prices, long distances and unreliable buyers) and the salinisation of considerable areas.

Most of the land within the scheme (46 percent) is registered in the name of smallholders who each occupy about 1–4 ha of land (see Table 2). In practice, only a small portion of them actively produce rice – less than 40 percent of smallholders in 2007 (Kajisa and Payongyong 2008). Others produce vegetables or maize, usually on just a small part of their land. While rice production is not profitable for smallholders in Chókwè, for larger-scale rice production it is. Other crops, however, are, on average, 60 percent more profitable (ACI 2005). At 2.1 t/ha, the average rice yields are very low, though the top 25 percent of farmers manage to get an average yield of 3.8 t/ha. The difference is mainly attributed to higher fertiliser use, a substantially higher labour allocation and more secure access to water (Kajisa and Payongyong 2008; Nakano et al. 2011). Until the arrival of MIA in Chókwè, there had been no operational rice processing facilities in the

13This was the worst flooding in 150 years (Silva et al. 2010).
vicinity of CIS for a long time. Farmers either sold unprocessed paddy or they went to Palmeiras, at almost 150 km from Chókwè, the closest operating rice processing factory (O’Laughlin 2009; Nhantumbo 2009).

Most of the farmers continued to have unregistered and insecure land rights and thus lacked access to credit (Chilundo, Munguambe, and Namagina 2012). Even when they did have title deeds, smallholders ran the risk of losing their land within the irrigation scheme, as HICEP had the right to remove people from their land if they did not pay the water fee (Pellizolli 2010b). In practice, however, many smallholders managed to operate ‘below the radar’ and avoided the obligatory registration in HICEP’s register of water users.

There is a strong socio-economic differentiation in the lower strata of Chókwè’s rural society which Amilai (2008) captures in his typology of three sub-categories of peasant rural households: impoverished households, auto-consumption households and consolidated households. Land is generally available in Chókwè, even for poor households (O’Laughlin 2009; Silva, Eriksen, and Ombe 2010; Chilundo et al. 2012), but not all households manage to use the land beyond production for home consumption. Within the irrigation scheme, there is a vibrant market for casual labour on commercial farms (Silva, Eriksen, and Ombe 2010). Brewing, trading, handicrafts and the collection and sale of firewood and reeds also provide important opportunities for income generation and diversification (MAE 2005 cited in Chilundo, Munguambe, and Namagina 2012). Livestock farming plays a much less important role in villages within the boundaries of the irrigation scheme than it does outside the scheme (Silva, Eriksen, and Ombe 2010). While labour migration has historically been very important for Chókwè, and continues to generate substantial remittances, the benefits are very unevenly spread across households. Moreover, labour migration continues to be strongly gendered, which reinforces the historical gendered pattern of work division in agriculture in which female-headed households face greater difficulties in engaging in commercial irrigated agriculture (Pellizolli 2008; O’Laughlin 2009).

### 3. MIA: an agribusiness investor promoting contract farming

This section contains the empirical material about the case under study. After discussing the government’s policy of supporting a ‘Green Revolution’ and the drive to increase domestic rice production so as to reduce imports (section 3.1), the investor’s philosophy of ‘impact investment’ is described and put in a global context (section 3.2). Section 3.3 describes how the investor ran into the problem of not being able to source enough rice to feed the processing factory it had acquired. This led it to draw up arrangements for the contract farming programme (section 3.4) which involved the careful selection (and creation) of medium- and large-scale farmers, which involved the removal of large numbers of smallholder from their land (section 3.5). The final section (3.6) describes how rice production substantially increased.

<table>
<thead>
<tr>
<th>Number</th>
<th>Area (ha)</th>
<th>Average holding (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company sector</td>
<td>16</td>
<td>5643</td>
</tr>
<tr>
<td>Private sector</td>
<td>889</td>
<td>5898</td>
</tr>
<tr>
<td>Family sector</td>
<td>11067</td>
<td>9928</td>
</tr>
</tbody>
</table>

Source: adapted from Chilundo et al. (2012) on the basis of data from Hidráulica de Chókwè Empresa Pública (Hydraulics of Chókwè Public Company, HICEP).
3.1. Policy context: the Green Revolution and import substitution

After a period of relative neglect within policy circles, CIS came back to public attention between 2003 and 2007 following plans to rehabilitate the scheme with ‘a preference for investments involving large commercial farmers’ (ACI 2005, 40). The government, through its investment coordination centre, developed a strategy to attract private investors into the rice sector, an initiative that attracted MIA’s interest in investing in Chókwè (ACI 2005). The government’s ‘Green Revolution strategy’, produced in 2007, also added encouragement for private sector-led development. This strategy included the objective of eliminating the need for rice imports (RoM 2007 in Pellizolli 2010a) which were running at an annual value of some USD 70 million in 2005 (ACI 2005), following 15 years in which the gap between production and consumption had continuously and rapidly increased. Between 1990 and 2005, rice consumption steadily grew by an average of 18 percent annually, while production grew for a few years (by 12 percent annually) and then stagnated (Kajisa and Payongyong 2008). This reflects the broader international trend, where production has not kept pace with increases in consumption, making rice particularly prone to global price hikes and speculation (Balasubramanian et al. 2007; Barclay 2010; Seck et al. 2010).

Despite an import tariff of 7.5 percent, imported (Thai) rice generally sells for less than domestically produced rice (ACI 2005). Even in Chókwè town, Thai rice is being sold and advertised on the street (O’Laughlin 2009). Rice imports steadily drove down prices between 2000 and 2005, probably contributing to the steep increase in national consumption (ACI 2005).

MIA’s plans for investment resonated well with both the government’s focus on private sector-led development and in substituting rice imports by local production. With support from the government of Mozambique, the company acquired the old rice processing facility, previously operated by the state-based company Orrizicola do Limpopo (ORLI) (Mozfoods 2010; Munguambe, Chilundo, and Julaia 2009). The latter had gone bankrupt when government support diminished as the result of re-orientating its strategy towards financing private companies (Nhantumbo 2009, 11). The rehabilitation and development of the basic processing, storage and marketing infrastructure was a central element of MIA’s strategy from the start. The underlying rationale of MIA’s investments was to create a stable linkage between local producers and the national market so that producers within the CIS would benefit from a secure output market. This is in line with MIA’s impact investment approach, which is discussed below.

3.2. The investor’s approach: impact investment

MIA is part of Mozfoods SA, a private company ‘partly set up by a charitable foundation linked to the British supermarket magnate Lord Sainsbury’ (AllAfrica 2009), and as such

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14 In 2005, this was called GPSA, Gabinete de Promoçao do Sector Comercial Agrario (Office for the Promotion of the Commercial Agricultural Sector), which was later transformed into CEPAGRI, Centro de Promoção da Agricultura (Centre for the Promotion of Agriculture).
15 The increase was mainly a result of area expansion after the peace treaty of 1992; yields per hectare hardly increased at all during this period.
16 Among major food products, rice is the only product facing an import tariff (ACI 2005, 46).
17 In 2010, MIA had the technical capacity to process 20,000 tons of paddy annually, and a matching storage capacity of 20,000 tons. In April 2010, MIA was in the final stages of installing a hi-tech mechanical dryer with a capacity of 350 tons/day.
18 Previously, this company was known as Moçfer. The name change was announced on Moçfer’s website on 4 June 2010 (Mozfoods 2010).
can be considered an example of ‘philanthrocapitalism’ (Bishop and Green 2008; Edwards 2009). According to its website, the mission of Mozfood is ‘to contribute to the economic and social development of Mozambique through the creation of commercially sustainable food industries, focused on the consumer, which stimulates the growth of Mozambican agriculture’ (Mozfoods 2010). This mission statement resonates with the impact investment paradigm as promoted through the Global Impact Investing Network (GIIN) whose ideas are laid out in a number of documents provided on their website. Bridging Ventures et al. (2009, 3) define impact investment as ‘actively placing capital in businesses and funds that generate social and/or environmental good and a range of returns, from principal to above market, to the investor’. The impact investment paradigm asserts that ‘substantial social impact’ and ‘positive financial returns’ to investments can be combined (Bridging Ventures et al. 2009, 4). Some investors operating within this paradigm seek competitive financial returns, while others are satisfied with much lower returns and place more emphasis on the social impact. Within this paradigm, Karamchandani, Kubzansky, and Frandano (2009) explicitly list contract farming as one of the seven business models that they see as having a good potential to succeed in ‘making a real and enduring improvement to the lives of the poor’ (4). Riddell (2009) identifies the agricultural sector in Africa as one sector/region where impact investment can successfully be practiced. This document discusses and compares a variety of business and investment models and states that contract farming through ‘the nucleus estate/outgrower model emerged in both the literature review and more particularly the country consultations as having the best potential for social impact’ (21). Practitioners of ‘classical’ forms of economic and rural development also support the impact investment paradigm, which is financially supported by the Rockefeller Foundation since ‘a mature impact investing industry will enable more investors to address a wider range of social and environmental challenges more efficiently, making our job easier in turn’ (Rodin 2009, 2). The paradigm matches well with the call for development models that are more entrepreneurial and require less state involvement, a call that has grown in strength over the last two decades.

3.3. Insufficient rice to run the factory

Even though MIA stated it was not looking for quick profits on its investment, it does aim to (eventually) operate profitably. Their figures show that their processing unit, which has a capacity of 20,000 tons of rice per year can break even at half this figure.19 Between 2004/2005 and 2007/2008, the area of rice cultivation in CIS fluctuated between 2000 and 3000 ha (see Table 5), with an average yield of 2.1 t/ha (Kajisa and Payongyong 2008), suggesting a significant shortfall from the break-even point identified by MIA (even if they were able to buy all the paddy produced within CIS). Therefore, MIA aimed to increase the total production of paddy within the perimeter of CIS through increasing both the area cultivated and the yield.

At first, MIA tried to get large areas of land within CIS to produce under the full control of the company, to run it as a nucleus estate. As one of MIA’s workers expressed it: ‘First we had in mind to produce rice ourselves to keep the factory running and only buy additional supplies from outgrowers’. These plans reached an advanced stage, with Amilai (2008) reporting that MIA was preparing to work on 14,500 ha. However, the government of Mozambique appears to have obstructed such a large-scale acquisition of land.

19Interview, 30 March 2010.
MIA then engaged in a strategy of making contracts with the irrigators’ associations that controlled the secondary canals of CIS. Munguambe, Chilundo, and Julaia (2009) describe in detail the case of Distributary 11 (D11) and its irrigators’ organisation (WUA) Associação dos Regantes do Distribuidor 11 (AREDONZE). This is the main area where MIA started to work in collaboration with existing farmers. It is located in the middle reaches of the irrigation system, and its office is based in the village of Massavasse, where most of its members live. The village grew around a former colonial settlement (Silva, Eriksen, and Ombe 2010). This area has the most suitable soils for rice production of the whole CIS (Touber and Noort 1985).

At this time, 276 ha ‘of the land of the D11 [was] already saline and abandoned’ (Munguambe, Chilundo, and Julaia 2009, 18). This left about 1000 ha of land that was suitable for crop production. This area was split in half with MIA cultivating half and the members of AREDONZE the other half. In return for the right to use 500 ha of land, MIA assisted AREDONZE in rehabilitating the irrigation infrastructure and ploughed and sowed an additional 100 ha of land managed by the members of the irrigators’ association. Both the rehabilitation and the agricultural services were provided at cost price and deducted from the amount that MIA paid for the delivered rice (Munguambe, Chilundo, and Julaia 2009). Nhantumbo (2009, 25), in his study on salt management strategies in CIS, observed that ‘companies like MIA […] try to avoid salt affected areas as much as possible’. This is also what happened in the case of the deal between MIA and AREDONZE, with MIA leaving the lower-lying fields, with drainage difficulties, to the original farmers.20

The farmers I encountered in the field mentioned mechanised land levelling, ploughing, seeding and harvesting as the services provided by MIA that they most appreciated,21 and also saw access to fertilisers and improved seeds as a great advantage. MIA also provided services that were otherwise not accessible to farmers. When I visited the area in November 2008, MIA was levelling fields by the use of sophisticated laser-level operated machinery, constructing micro-relief contour bunds (see Figure 1). Large combine harvesters were used for harvesting (see Figure 2).

Even though farmers appreciated these services, they also voiced a number of complaints: late payments (more than 3 months overdue), unclear grading procedures of the produce, losses due to late harvesting, late land preparation and seeding (Munguambe, Chilundo, and Julaia 2009). In 2008, farmers began to indicate that they wanted to recover the 500 ha that they had temporarily provided to MIA. This led to the 2-year contract between MIA and AREDONZE not being renewed and to MIA further having to change its strategy.

3.4. MIA’s contract farming programme

In preparation for the 2008/2009 season, MIA started to develop contracts with individual farmers rather than with irrigators’ organisations. One of the staff members of MIA indicated22 that this change was related to the debts that the associations had incurred and a
lack of clarity about who would be responsible for these. This was possibly a result of the strategy of associations to enter into business together in order to protect individual members from getting into financial problems (Pellizolli 2010b). Contract farming arrangements are package deals introduced by companies seeking to control production chains. In southern Africa, this construction is widely used for classical cash crops that require a considerable degree of processing, such as cotton and tobacco, but it is relatively new for rice production. Companies provide inputs (seeds, fertiliser) and services (land levelling, agricultural extension, repairs to the irrigation infrastructure) on credit that is offset against the price paid for the produce. This price is pre-determined and the farmers are obliged to exclusively sell the produce to the contracting company (Eaton and Shepherd 2001; Bijman 2008).

In the case of Chókwè, contract farming involves the individual ‘Associated Producers’ (AP) signing a contract which commits them to cultivating a specified area for one production season, with the obligation to:

Figure 1. Contour-bunds constructed with highly sophisticated laser-level machinery. Photo taken by the author on 10 November 2008.

Figure 2. Harvesting the field of an Associated Producer with a combine harvester. Photo taken by the author on 30 March 2010.
prepare the land with equipment approved or provided by MIA;
- exclusively use seed varieties approved by MIA, sown at recommended densities;
- apply fertilisers and pesticides in quantities recommended by MIA;
- follow good agronomic practices as recommended by MIA;
- obey the recommendations and instructions provided by MIA during the season;
- sell the produced rice at the price determined by MIA for the season.23

In return, MIA commits itself to buy all the rice produced under the agreement against an indicative price, which can be adjusted by MIA taking into account international marketing conditions. Payments are promised to be made by (at the latest) the end of the week following the delivery of the produce to the factory. The actual price per kg paid to a producer depends on a number of quality characteristics stipulated in the contract (see Table 3). For the 2009/2010 season, the reference price was initially set at 6.0 Mtn/kg (new Metical, the equivalent of about USD 0.21/kg), although this was adjusted to 6.6 Mtn/kg (∼USD 0.23/kg) by the time of harvest.

In addition to the core services provided by MIA (land preparation, seeds, fertilisers and pesticides), producers could request additional services, to be provided by MIA at set prices – and to be paid for at the end of the season (see Table 4). Agronomic advice was provided free of charge by a team of internationally trained agronomists and extension workers. MIA’s head agronomist is a well-trained Brazilian rice specialist with extensive experience of large-scale commercial rice production in Brazil.

An interest of 14 percent annually was charged for the credits taken and applied to the period between the day of service delivery until the day of the delivery at the factory.24

The rice is packaged by MIA and marketed in Mozambique under the brand name ‘Tia Rosa’, with the slogan ‘The quality of Chókwè’s fresh rice at your table. Eat rice from our land, indulge in Tia Rosa’ (Mozfoods 2013).

Table 3. Price differences on the basis of quality characteristics stipulated in the contract.

<table>
<thead>
<tr>
<th></th>
<th>Benchmark</th>
<th>Penalty</th>
<th>Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign materials</td>
<td>0%</td>
<td>1% deduction for each 1% above</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>&lt; 13%</td>
<td>1.5% deduction for each 1% above</td>
<td></td>
</tr>
<tr>
<td>Pollinated rice</td>
<td>&gt; 70%</td>
<td>0.5% deduction for each 1% below</td>
<td>0.5% increase for each 1% above</td>
</tr>
<tr>
<td>Whole grain (not broken)</td>
<td>&gt; 46%</td>
<td>0.5% deduction for each 1% below</td>
<td>0.5% increase for each 1% above</td>
</tr>
<tr>
<td>Chalky grain</td>
<td>&lt; 10%</td>
<td>0.5% deduction for each 1% above</td>
<td></td>
</tr>
<tr>
<td>Red grains</td>
<td>&lt; 3%</td>
<td>1.5% deduction for each 1% above</td>
<td></td>
</tr>
<tr>
<td>Green grains</td>
<td>&lt; 3%</td>
<td>1% deduction for each 1% above</td>
<td></td>
</tr>
</tbody>
</table>

Source: Sample contract for 2009/2010 season provided by Moçfer Industrias Alimentares (MIA).

- Source: sample contract provided by MIA during a field visit.
- In practice, this works out to 4.5–4.8% effective interest over the production period.
3.5. The selection and creation of medium- and large-scale farmers

In the 2009/2010 season, MIA was selective in the farmers it signed contracts with, choosing only those whom they considered to have a capacity to farm profitably. Approval by MIA sometimes led to HICEP giving (additional) land to some farmers.

3.5.1. The application and assessment procedure

In an interview, followed by a field visit to the fields of an AP, the head agronomist of MIA explained how they select their APs. MIA convened community meetings to explain the basic arrangements. Interested farmers were invited to visit MIA where they were individually interviewed with a focus on their past experiences, trying to establish their strengths and weaknesses. At these interviews, the contract was also discussed and farmers were given an indicative price. In total, 320 interviews were held and 229 producers were selected, of which ‘about 50’ were women. MIA’s head agronomist acknowledges that the company was quite selective and that the main reasons for refusing applicants were a lack of capabilities or unsuitable land. The latter seems to be somewhat contradictory, as the analysis (below) shows that the producers selected by MIA were allocated large pieces of land by HICEP to use for this purpose, although it is possible that some farmers were not able to get suitable land from HICEP despite being selected by MIA.

The agronomist explained the role of the field visit in the assessment procedure:

Before we do the contract we visit the farmers’ fields and assess the access to irrigation water, the possibilities to drain the area well and the general land quality, especially the salinity.²⁵

When I asked who the APs are, he responded:

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²⁵Field notes, 30 March 2010.
Some of these producers stopped after the floods of 2000 and some are people with no experience in agriculture but who are now entering agriculture in response to the president’s talks about a Green Revolution. These are for instance people with other jobs or with shops in town: they do agriculture as a business. 

MIA reported that the average yield of their APs was probably around 2–3 ton/ha before they started collaborating with MIA. This was higher than the then-prevalent average rice yields of 2.1 t/ha, but lower than the 3.8 t/ha that the top 25 percent of farmers had managed to achieve (Kajisa and Payongyong 2008).

3.5.2. Land concentration and the role of HICEP

The director of MIA stated that in the 2009/2010 season, MIA worked with APs on about 3400 ha. This was later confirmed by the head agronomist, who is also responsible for making these contracts and maintaining relations with the producers.

With 229 producers on 3400 ha, the average size per farmer is almost 15 ha. Upon expressing my surprise at this relatively large size, the head agronomist explained:

The minimum area that farmers need to have is 8 ha. We have done this as we have found out that working with small producers gives the problem that they produce small quantities and that they want to keep half of that for home consumption and thus hardly sell to us.

This quote reaffirms that the primary objective of MIA is to source enough rice to keep their factory running, rather than increasing the production of rice in CIS. Small field sizes also raise scale issues with regard to the operation of MIA’s large machinery (tractors and combine harvesters combines), as shown by the following quote: ‘We make an exception if four small farmers fill a complete ramal, which makes it possible to prepare [and harvest] the whole area at once’.

As MIA only buys rice from its APs, small farmers are not only excluded from the access to inputs, credits and machinery, but they also, critically, still lack a market outlet for their rice (see also Pellizzoli 2010a).

Table 5. Cropped areas in the Chókwè Irrigation System (CIS), season 2004–2010.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Cropped area (ha)</th>
<th>Plan (ha) 2009/2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>1998</td>
<td>156</td>
</tr>
<tr>
<td>Other</td>
<td>663</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>2661</td>
<td>221</td>
</tr>
</tbody>
</table>

Source: PowerPoint presentation provided by Hidráulica de Chókwè Empresa Pública (Hydraulics of Chókwè Public Company, HICEP) on 31 March 2010.

²The very small area cultivated in 2005/2006 is related to a major rehabilitation that was implemented in that year which meant that no water could be delivered through the main canal.

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²⁶Field notes, 30 March 2010.
²⁷Field notes, 30 March 2010.
²⁸CIS is divided into blocks of 16 ha that are referred to as ramal. Each ramal is served by a caleira (also called a regadeira), which, in irrigation design terms, would be called a tertiary canal.
²⁹Field notes, 30 March 2010.
One of the board members of AREDONZE explained that in the 2009/2010 growing season in D11, 550 ha was under individual contracts to MIA. Of these 550 ha, 500 ha is cropped by 30 APs, who thus had an average farm size of almost 17 ha. This 500 ha is the area that in 2006/2007 and 2007/2008 was under MIA’s full control and which seems to be the best part of the D11 area.

There are an additional 16 farmers in D11 who are in contact with MIA. They have divided an ‘experimental area’ of about 50 ha between themselves (about 3 ha each). According to a board member of AREDONZE, this is in order ‘to prove to MIA that they are also able to produce’. The head agronomist of MIA confirmed this construction and explained that it is an exceptional situation that they engaged with in D11 ‘as we have already worked with them for a long time and we wanted to help them a bit’. These farmers did initially not pass the selection criteria, but were given a second chance to show that in practice they are able to handle production on a larger area. The AREDONZE board member also mentioned that 130 ha was left for the remaining 190 members, an average of about 0.7 ha per member.\(^{30}\)

In order to ensure that the APs have a minimum of 8 ha of land each, in favourable places, and preferably close to each other, land had to be reallocated. The WUA and its board members played a crucial role in this, as this interview extract shows:

GJV: After the contract between MIA and AREDONZE finished, did people get back their own pieces of land?
[AREDONZE board member]: No, we have re-divided the land so that the younger people who can work large pieces of land can also have a chance. The land was very fragmented and often in the names of old people that are not even capable of using it. We have made a provisional division now, but we aim to make this official in collaboration with HICEP.
GJV: I was not aware that HICEP has possibility to re-allocate land …
[AREDONZE board member]: Yes, HICEP used to be only in charge of managing the irrigation system, but now does the land registration as well.\(^{31}\)

This was confirmed by the head agronomist of MIA, who explained that potential APs, approved by MIA, can go to HICEP to get allocated the land area that MIA wants to cultivate together with them. In an interview with the head engineer of HICEP, this topic was further explored:

GJV: In relation to MIA’s programme with Associated Producers, what is the role of HICEP in the re-allocation of land?
[HICEP official]: Since last year November [2009] we were also assigned the role of management of the land. In that capacity we have been looking for possibilities to cooperate with MIA.
GJV: Is there suitable land available that can be allocated to farmers that want to enter into contract with MIA?
[HICEP official]: All the land within the perimeter of CIS is occupied, but when people do not use the land … eventually the land belongs to the state. There are many small producers. We

\(^{30}\)The total land area reported as being used in D11 during the 2009/2010 season was 680 ha: 500 ha by APs, 50 ha by experimental APs and 130 ha by small producers. This is considerably less than the 1000 ha reported for the 2006/2007 and 2007/2008 seasons. The reasons for these differences are not clear but are possibly due to larger parts of D11 not being very suitable for crop production anymore, due to water logging and salanization.

\(^{31}\)Field notes, 29 March 2010. Also see Van der Struijk’s MSc thesis (2013) which illustrates the role of the WUA board members in land concentration within the WUA boundaries.
consider farmers with up to 2 ha as part of the ‘family sector’. We do not want to send them out of the scheme, but we put them at one place together.\footnote{Field notes, 31 March 2010.}

Van der Struijk (2013) interviewed various smallholders who complained that their land had been taken by MIA (or its APs) and that they had been moved to smaller areas, farther away from their houses (although there is no evidence that their actually cultivated areas decreased). Collaboration between MIA, the WUA board and HICEP made it possible for ‘able farmers’ to engage in a contract farming scheme using relatively large pieces of land, which at least to some extent were previously held by small producers.

3.6. \textit{The effects on production and investment}

As a result of MIA’s contract farming programme, the area under rice cultivation in CIS has increased sharply. Yields also increased considerably and there were signs of increased investment in irrigation infrastructure.

3.6.1. \textit{Area and yield}

In the 2008/2009 season, MIA started its individually based contract farming programme, engaging in individual contract farming that covered 1200 ha. MIA states that it had had the intention to start on a much larger area. However, due to problems with the Massingir Dam further upstream on the Limpopo River, there were questions as to whether it would be possible to deliver sufficient water to CIS during the growing season. Farmers were therefore anxious to prepare their land. Only at the beginning of December,\footnote{Ideally, land preparation starts in July, while transplanting and seeding take place in October and November (Chilundo et al. 2012).} following guarantees from the President, did MIA start preparing the 1200 ha (which took 45 days). Ideally, planting (and, with that, harvesting) is done over a longer period of time. In 2008/2009, the late planting caused a capacity problem at harvesting time, with as a resultant loss of harvest.

In the 2009/2010 season, in addition to rice for consumption on 3400 ha with APs, MIA also produced rice seeds on 600 ha within CIS,\footnote{MIA had aimed for 5000 ha of land cultivated by APs, but did not manage to finish the selection process in time.} which was fully under its own control. As can be seen in Table 5 and Figure 3, this contributed substantially to the sharp increase in the cropped area within CIS.

It remains unclear to what extent the ‘family sector’ is represented in these statistics. It is likely that grain or vegetable production for home consumption and petty commodity sale is not noted in the land use registration of HICEP because of the informal character and the sometimes very small plots.\footnote{See also the discussion by Pellizzoli (2010a) about this issue.}

In 2010, MIA reported that the average rice yield on AP fields was 4 t/ha, a substantial increase compared to the 2–3 ton/ha that MIA estimated as the average yield of these APs before they engaged in contract farming. This seems a realistic figure, compared to the 3.8 t/ha that the top 25 percent farmers were previously able to achieve, also with a high level of inputs (Kajisa and Payongyong 2008). Chilundo, Munguambe, and Namagina (2012), on
the basis of HICEP data, report a steady average yield of 4.7 t/ha from the 2009/10 season onwards for the whole of CIS.

3.6.2. Profitability and water fees

Both MIA and the few APs that I interviewed reported that the contract farming arrangement was very profitable for the farmers. An AP calculated that his net profit was about 5000 Mtn/ha (about USD 170/ha): ‘MIA pays 6 Mtn/kg and we produce 3.5–4 ton/ha, which makes about 24,000 Mt/ha. The costs that are deducted by MIA are about 19,000 Mt/ha’.

The head agronomist of MIA showed me the final accounts of an AP who had already finished the 2009/2010 season and who made a profit of about 50,000 Mtn (about USD 3500) on an area of 8 ha by producing slightly more than 4 ton/ha. This contrasted with the case of another AP who incurred a loss of about 50,000 Mtn (about USD 1750) when producing only 2 ton/ha, also on 8 ha.36

The profits of individual farmers could be quite diverse, partly because of differences in yield and area, but also because the price per kg varies according to quality (roughly between 5.5 and 6.3 Mtn/kg, or USD 0.19–0.22/kg), and the costs of the inputs depend on the services provided by MIA (roughly 15–20,000 Mtn/ha or USD 5–700/ha). Tables 6 and 7 show projections of the profits that can be made.

According to MIA, it is exceptional that farmers incur debts under these arrangements, although the tables do show that a profit is certainly not guaranteed. In the cases where debts were incurred, it is said to be almost always the result of poor water management: a combination of late or insufficient water deliveries and poor drainage. HICEP acknowledged that water management was a very difficult task after such a rapid increase in cropped areas. MIA suggested that they may withhold the payment of (part of) the water fees to HICEP to compensate those farmers who incurred debts as a result of poor water management, but it could not be confirmed whether this actually happened.

36It was not possible to cross-check the numbers presented by MIA, but they are within the ranges presented in Tables 6 and 7.
4. Conclusions and discussion

This contribution firstly examines how a contract farming programme transformed the organisation of agricultural production within the Chókwè Irrigation Scheme. It argues that this came about through the coordinated actions of an investor seeking to integrate the various productive elements into a programme that meets set government objectives – in other words, increased domestic rice production. I begin the conclusion by summarising these changes in the relations of production and the redistribution of its burdens and benefits by covering the 12 dimensions suggested by Hall (2011) (although I avoid making a checklist of each point in order).

The Chókwè case involves an outgrower business model for rice contract farming, aiming at import substitution with the source of the capital provided by an ‘impact investment’ arrangement. Section 3 of this paper shows how this contract farming programme led to a radical transformation of the organisation of production. The programme ran for 3 consecutive years, covering more than 3400 ha of an irrigation command area of 26,000 ha (of which only some 7000 ha is in use, due to damaged irrigation infrastructure). This area was brought under an intensive and highly mechanised form of production that is reminiscent of the state-socialist period. Existing tenure relations were severely uprooted and the parastatal irrigation management agency (HICEP) was given the authority to grant and withdraw land rights. This was possible in a context of informal and unclearly defined land rights that have existed since the re-distribution that followed the dismantling of the former state farms and co-operatives. The inclusive business model sought to engage with locally established producers, who may be small in the eyes of the company, but who are very large compared to other local farmers, who were excluded from the arrangement. With support from the Mozambican state, hundreds of smallholders were relocated within the irrigation system and given (much) smaller and more distant land allocations, even though their actually cultivated area often was not reduced. There was no relocation of the homesteads. The

| Table 6. Profit in USD/ha with production costs of about 690 USD/ha (20,000 Mtn/ha) and variable yield and price per kg. |
|---|---|---|---|---|---|
| | 2 t/ha | 3 t/ha | 3.5 t/ha | 4 t/ha | 5 t/ha |
| 6.3 Mtn/kg | −255 | −38 | 71 | 179 | 397 |
| 6.1 Mtn/kg | −269 | −59 | 47 | 152 | 362 |
| 5.9 Mtn/kg | −283 | −79 | 22 | 124 | 328 |
| 5.7 Mtn/kg | −297 | −100 | −2 | 97 | 293 |
| 5.5 Mtn/kg | −310 | −121 | −26 | 69 | 259 |

Source: Author’s own calculation on the basis of figures provided by key informants.

| Table 7. Profit in USD/ha at production costs of about USD 515/ha (15,000 Mtn/ha) and variable yield and price per kg. |
|---|---|---|---|---|---|
| | 2 t/ha | 3 t/ha | 3.5 t/ha | 4 t/ha | 5 t/ha |
| 6.3 Mtn/kg | −83 | 134 | 243 | 352 | 569 |
| 6.1 Mtn/kg | −97 | 114 | 219 | 324 | 534 |
| 5.9 Mtn/kg | −110 | 93 | 195 | 297 | 500 |
| 5.7 Mtn/kg | −124 | 72 | 171 | 269 | 466 |
| 5.5 Mtn/kg | −138 | 52 | 147 | 241 | 431 |

Source: Author’s own calculation on the basis of figures provided by key informants.
company’s requirement that Associated Producers cultivate at least 8 ha, and the very highly mechanised production process (which implied very low labour requirements), meant that very few local people actually benefitted. Land and water resources were enrolled into a production process that is strongly controlled by the company, which owns and controls the infrastructure that provides agricultural inputs, processing and marketing, and plays a decisive role in production decisions at the field level and prices at the end of the chain. The irrigation infrastructure remained in the hands of the parastatal irrigation management agency, but by representing its Associated Producers, the company pressured the parastatal agency to improve water management and make investments in infrastructure, thus acquiring a strong influence over water infrastructure and management within CIS.

Over the course of 3 years, the control over land and water resources shifted radically, both at the scheme level (where the company became a very strong player) and at the field level (where already-well-endowed farmers benefitted by increasing their areas). This example of an impact investment approach that aims to improve market linkages through contract farming shows that it can have highly transformative and socially skewed effects, though they did not fully materialise, as a consequence of the premature collapse of the scheme. These effects do not come about automatically but are related to particular choices about the ‘detailed arrangements of the scheme’, which indeed ‘may be more important than the abstract model’ (Vermeulen and Cotula 2010). Many of these choices were made in the context of the government’s latest attempt to make the irrigation system deliver food for domestic consumption – in other words, ‘a working whole’ (Veldwisch, Bolding, and Wester 2009). The 12 dimensions put forward by Hall (2011) are a useful checklist to capture the breadth of large-scale agricultural investments, but provide few clues as to how and why they lead to a certain transformation. For this reason, I analyse the crafting of the integrative linkages put in place to make the business model ‘work’, aiming to make the investment succeed. The public–private collaboration between MIA and the Mozambican government played a central role in the reorganisation of the ‘production network’ within and around the irrigation scheme, in which policies, people, technological objects and knowledge have been brought together in at least five new ways.

In the first place, the company and the state established a strategic alliance, both at the level of a development model and on specific policies. The company’s impact investment approach links the globally dominant paradigm of a market- and private sector-led development model with Mozambique’s continued commitment to make CIS into ‘the breadbasket of the nation’, this time within a paradigm of private sector-led development. It is in this context that the public–private collaboration facilitated the company in acquiring an influential position in restructuring agricultural production, which was supported by the state playing a key role in removing large numbers of smallholders from the best pieces of land. Very specific criteria were used to identify preferred types of farmers, who were enrolled into the network, while others were excluded as rice producers and in effect ousted from the network.

Secondly, the company linked rice producers in Chókwè to Mozambican rice consumers, by fulfilling a number of market chain functions: buying paddy and processing, storing, packaging, branding and transporting it. In this way, the company extended the socio-technical network on the output side, making CIS a recognised place of rice production for urban consumers, and strengthening the image of CIS as the ‘breadbasket of the nation’. Selected rice producers could now sell large amounts of paddy from their fields at stable prices.
Thirdly, agricultural inputs for intensive rice production (quality seeds, fertilisers, pesticides, machinery and credit) were made available in Chókwè in large quantities, more or less at the right time. This involved the effective enrolment of a whole variety of actors and technological objects into the production network of CIS, creating the necessary preconditions for farmers to engage in a technological- and capital-intensive way of rice production.

Fourthly, the company imported the knowledge to effectively use these technologies, and made it available to farmers through its own agronomists. The company’s head agronomist was a well-trained Brazilian rice specialist with extensive experience of large-scale commercial rice production in Brazil. Thus, a link was created to international experiences and knowledge networks around intensive rice production.

Fifthly, and probably most crucially, the coordination and control were concentrated in a single entity. Through the procedure of contracting APs, the company coordinated the planning of the areas to be sown, and was able to control the choice of rice seeds and other agricultural inputs to be used. This was done by making adjustments to the control of the supply chains for these technologies. The choices for particular technologies were informed by availability, international experiences and the ability to support them through extension. These choices were made by the same people who provided extension services to the farmers. Direct feedback mechanisms were thus created between the field level practices, input supplies and output markets. Moreover, the company’s extension services went beyond providing open advice and were highly prescriptive, increasing both the uniformity of production within CIS and coherence along the chain of production and marketing. Another expression of the company’s role as network coordinator was evident in its attempt to increase the efficiency of the parastatal water management agency (HICEP), by putting itself forward as the payer of the water fees for all its APs and then using this position to exert leverage and withhold payment when damage was caused by poor irrigation or drainage services.

The rural transformations that resulted from this contract farming scheme closely resemble those that occur through other forms of large-scale land acquisition. The coordinated actions of an agribusiness investor, in collaboration with state institutions, have led to similar transformations, without any transfer in formal land ownership to the company. This case closely resembles the definitions of land and water grabbing put forward by Borras et al. (2012) and Mehta, Veldwisch, and Franco (2012), respectively. By establishing itself in a central position of coordination and control within the ‘production network’, enrolling new elements (large commercial farmers and new technologies), ousting others (particularly smallholders) and changing the connections between the different elements, the company managed to redirect the benefits of land and water use towards itself while leaving the risks with the contract growers. The result was a sharp increase in rice production for the Mozambican market, but with highly skewed effects for local farmers. It remains unclear how such a state-managed, large-scale irrigation system can be reinvigorated while distributing the burdens and benefits more equally. ‘Inclusive business models’, even when implemented with good intentions, are no guarantee of success in this respect.

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