

Smallholder Irrigation Schemes, Agrarian Reform and ‘Accumulation from Above and from Below’ in South Africa

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A key issue in debates on agrarian reform in South Africa is the potential for small-scale farming, in conjunction with redistributive land reform, to make a significant contribution to employment creation and poverty reduction. Two problems hinder these debates – the paucity of reliable data on small-scale agriculture, and lack of clarity on the meaning of terms such as ‘smallholder’ and ‘small-scale farmer’. This paper applies class-analytic perspectives on social differentiation to critically examine these terms, and explores the prospects for ‘accumulation from above and from below’ through agrarian reform, drawing on wider debates within the Southern African region. It focuses in particular on smallholder irrigation schemes, potentially a key focus of policy, and presents research findings on production and marketing of fresh produce in one such scheme in Tugela Ferry, KwaZulu-Natal. Survey data show that farming households combine agriculture and various forms of off-farm labour, as is often the case throughout the region, and that accumulation in small-scale agriculture is constrained by a number of factors, including the inherited and largely untransformed agrarian class structure of South Africa. In this context, expanded access to land and water is a necessary but not sufficient condition for such accumulation; wider structural change is also required.

Keywords: accumulation, agrarian reform, irrigation, small scale farming, South Africa

INTRODUCTION

Can a greatly expanded small-scale farming sector, in conjunction with redistributive land reform, make a significant contribution to rural development, employment creation and poverty reduction in post-apartheid South Africa? This question has been hotly debated since the transition to democracy in 1994 and continues to generate controversy. Recent national policy documents that seek to address the very high levels of unemployment found in South Africa have answered in the affirmative: the *New Growth Path* (EDD 2010) proposes that creating opportunities for 300,000 households in ‘agricultural smallholder schemes’ by 2020 is a key objective. The National Planning Commission’s draft *National Development Plan* (NPC 2011,

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197) states that one million new jobs can be created in agriculture and related industries over the next two decades, mostly through labour-intensive forms of small-scale farming in communal areas and on redistributed land, with many engaged in irrigated farming. The Commission suggests that there is potential to expand the area under irrigation from 1.5 million hectares to 2 million hectares (*ibid.*, 197), and asserts that market opportunities exist for increased production of fruit for export and vegetables for the domestic market, as well as niche crops such as nuts, olives and berries, which are small-scale and labour-intensive in character (*ibid.*, 201–4).

These targets for smallholders are clearly very ambitious, given that the total number of black households engaged in small-scale farming has remained at more or less the same level over the past decade and a half, and that land reform so far is widely acknowledged as failing to create conditions for successful small-scale farming (Aliber and Hart 2009; Hall 2009; Aliber and Hall 2010; Greenberg 2010). Are they feasible? Sceptics abound (e.g. Sender and Johnson 2004; Palmer and Sender 2006; Marais 2011, 218), on the grounds that there is little evidence (in the South African context) to support the view that smallholders are highly productive, or that land reform has reduced rural poverty.

Two key problems hinder policy debates. One is the paucity of reliable and detailed empirical data on small-scale farming in South Africa, and in particular on farming by land-reform beneficiaries. The second is conceptual: what exactly is meant by the terms 'smallholder' and 'small-scale farmer'? The recent literature acknowledges that these terms are somewhat imprecise, and that key differences exist within the ranks of small-scale farmers (see, e.g., Aliber et al. 2009a), but the criteria used to define such terms tend to be inconsistent. A common distinction, with a long provenance in South Africa, as elsewhere, is between a large group of 'subsistence or semi-subsistence' farming households and a much smaller number of commercially oriented, 'semi-commercial' or 'emerging commercial' smallholders (Bembridge 1986; Nicholson and Bembridge 1991; Vink and van Rooyen 2009). This echoes the mainstream international literature on agricultural development, where the term 'differentiation' is now increasingly in use. Wiggins (2009, 14), for example, states that surveys 'often show that the bulk of marketed output from small farms comes from those that are towards the upper part of the range [of farm sizes]', and thus that 'there is considerable differentiation amongst small farms' (*ibid.*, 15). Rarely addressed are the causal processes that underlie such differentiation. Much of the literature, both in South Africa and further afield, tends to ignore rich debates in materialist political economy on the dynamics of rural class formation in capitalist economies, and how these articulate with wider processes of social, economic, political and cultural change.

This paper aims to contribute to current debates on small-scale farming and agrarian reform in Southern Africa. It focuses in particular on smallholder irrigation farming, which might well become a key focus of agrarian reform policy in the future, and applies a class-analytic approach to the understanding of social differentiation within small-scale agriculture, drawing on debates on the agrarian question in the wider Southern African region and elsewhere. A key analytical distinction in this literature is between 'accumulation from above' and 'accumulation from below', which helps to clarify how processes of agricultural growth take place in capitalist economies, as well as in transitions to capitalism, and who benefits from such growth. Key policy questions in South Africa are how broad-based agrarian reform should be, given that employment creation and poverty reduction are key objectives, and how feasible it is. Answers to this question are explored in the light of research findings on production and marketing of fresh produce in an irrigation scheme in Msinga, a densely settled communal area in the province of KwaZulu-Natal.

SMALLHOLDER FARMING, CLASS DYNAMICS AND 'ACCUMULATION FROM ABOVE AND BELOW'

Debating the Agrarian Question

Contemporary policy debates on small-scale farming and agrarian reform tend to ignore questions of their class dynamics. A key term used by many is 'smallholder', but this is problematic because it suggests that small-scale farmers are relatively homogeneous and it obscures the causal processes through which inequalities emerge, often resulting in misleading assumptions of common interests in development planning (Cousins 2011a). In contrast, a class-analytic perspective, centred on the concept of petty commodity production, allows an understanding of the generalized tendency towards rural class differentiation in capitalist economies, manifested in the differentiated character and diverse trajectories of small-scale agriculture (Bernstein 2010). As in Lenin (1967 [1899]), *middle peasants* are able to meet the exigencies of simple reproduction from their own efforts, and *poor peasants* are unable to survive without 'squeezing' either their capital or their labour power, or both; over time they may be forced to rely almost wholly on the sale of their labour power in order to survive, becoming either proletarians or semi-proletarians (if they continue to engage in some level of agricultural production). *Rich peasants* are able to engage in expanded reproduction, and may transform themselves over time into capitalist farmers.

The dynamics of class differentiation are a key feature of debates on the 'classic' agrarian question. According to Byres (1991, 1996) and Bernstein (1996a, 2009), the literature on the agrarian question can be seen as encompassing three distinct but interconnected themes: (a) a problematic of production – in transitions from pre-capitalist to capitalist agriculture and the development of the productive forces in farming that this entails; (b) a political problematic – the role of peasants and farm workers in struggles for democracy and socialism; and (c) a problematic of (industrial) accumulation – the contributions of capitalist agriculture to industrialization. Class differentiation and its political implications are integral to all three, as in Marx's analysis of primitive accumulation in the English countryside, which provided the basis for the emergence of capitalist agriculture and subsequently of industrialization; in Lenin's discussion of the Russian peasantry as a potential ally of the organized working class; and in Byres' (1991, 1996) comparative analysis of pathways of agrarian transition in different national and historical settings. In these debates, the agrarian question is resolved when agriculture is fully capitalist, or when capitalist industrialization has occurred (whether or not agriculture has undergone a capitalist transition).

Where does that leave rural social formations in countries where neither of these transitions is in evidence, as is the case in many parts of the world today? It is clearly problematic to attempt to directly apply conceptual models drawn from 'classic' formulations of the agrarian question in Europe in the late nineteenth or early twentieth centuries to other places and times. In any case (following Bernstein 1996a), there remain ambiguities and tensions in the original formulations: issues of the differential timing of transitions in a changing world-historical context; the great 'substantive diversity' in contexts, conditions and processes, as analysed by Byres (1991, 1996); and a tendency to propose predominantly 'internal' forms of explanation (internal to the economic logic of agrarian modes of production, specific agrarian class formations and particular social formations) (Bernstein 1996a, 39; Bernstein 2009, 256–57).

Today, in an era of renewed and expanded capitalist globalization, the international dimension is central to any rethinking of the agrarian question, as is the effective roll-back (or collapse) of the 'developmental state' over the past three decades. Commodity relations

permeate all economic activity, including small-scale farming in poor countries, and agriculture as a sector is increasingly dominated by new forms of capital upstream and downstream of farming, with agri-business capital increasingly global in its scope. The high levels of productivity achieved by capitalist agriculture have not eliminated hunger, high levels of waste coexist with the under- or malnutrition of hundreds of millions of people, including in the rural areas of the global South, and the ecological contradictions of capitalist agriculture have emerged ever more clearly (Weis 2010).

In this context, contrasting formulations of a 'new agrarian question' have been proposed. Bernstein (2009, 250), for example, argues that 'the centrality of any agrarian question to industrialization is no longer significant for *international* capital. In this sense, then, *there is no longer an agrarian question of capital on a world scale*, even when the agrarian question – as a basis for *national* accumulation and industrialization – has not been resolved in many countries of the South' (emphases in the original). However, globalization also generates an intensification of the 'fragmentation of classes of labour', who 'pursue their reproduction through . . . insecure and oppressive – and in many places increasingly scarce – wage employment often combined with a range of likewise precarious small-scale farming and insecure "informal sector" (survival) activity . . .' (ibid., 250) and this constitutes a 'crisis of labour as a crisis of reproduction' (ibid., 251). This constitutes a new 'agrarian question of labour', which is permeated by class tensions and contradictions, in part because these tensions are inherent in petty commodity production, whether in farming or other informal-sector activities.¹

Bernstein's formulation is controversial. For Akram Lodhi and Kay (2009), the agrarian question of capital has not been resolved, and cannot be separated from that of labour; the core of the agrarian question is the balance of class forces, nationally and internationally. This is contingent and variable, producing substantive diversity across different national and regional contexts, but the nature and trajectory of accumulation within (incomplete) transitions to capitalist agriculture remain central issues in many contexts.²

The Agrarian Question and 'Accumulation from Above and Below'

Bernstein (1996a, 52) remarks that two of the three underlying problematics addressed by the 'classic' agrarian question, those of production and politics, may continue to be salient even after the third, the transition to (industrial) accumulation, has been resolved. He suggests that 'Lenin posed an agrarian question of the working masses, both proletarian *and* poor peasant', and links this notion to Lenin's discussion of two paths of agrarian change, the Prussian and the American, as well as to the generalization of the 'peasant path' in the politics of anti-colonial and national democratic movements, where the overthrow of predatory landlords is integral to both economic progress and the struggle for democracy. The key difference between the Prussian and American paths, and the key to their wider political significance, is the class character of their transitions to capitalist agriculture.

The Prussian path, in which pre-capitalist landlord classes slowly transformed themselves into agrarian capitalists, can be described as a process of *accumulation from above*. The American path, where conditions for petty commodity production become established, and a fully capitalist agriculture emerges through class differentiation from within the ranks of family farmers,

¹ According to Bernstein (2009, 252), it must also be acknowledged that the agrarian question of labour lacks the 'systemic and world-historical significance' of the agrarian question of capital.

² For alternative formulations of the contemporary agrarian question, see McMichael (2009), Watts (2009) and van der Ploeg (2010).

exemplifies *accumulation from below*. The latter is more progressive because of its broad-based character and its greater dynamism in developing the productivity of farming, as well as its implications for democracy (Bernstein 1996a, 34).

While there are no 'off-the-shelf' models, given the diversity of specific historical conditions, trajectories and mechanisms, Byres (1991, 61; cited in Bernstein 1996a, 36) suggests that agrarian transition from below remains a possibility if certain conditions can be met: 'a powerful state, with the capacity to move against the social, political and economic power of a strong landlord class', combined with 'sustained struggle by peasants'. On the eve of democratic transition in South Africa, Neocosmos (1993, 6) argued that 'the very issue of the democratisation of state structures will in practice put the question of accumulation from below on the agenda', citing Mamdani's (1987) formulation of accumulation from above, based on extra-economic coercion, and accumulation from below, which involves unequal relations of 'free' commodity production entered into 'voluntarily'.

Mamdani's work on class dynamics in rural Uganda is also invoked by Bernstein (1996b), who suggests that the agrarian question in South Africa can be seen as 'extreme and exceptional' in character. In the past, the political power of white commercial farming interests led to state policies that helped supply cheap farm labour, provided extensive agricultural subsidies, and established a bureaucratic regime to regulate production, distribution and trade in the interests of agricultural capital. The agrarian question *of capital* was resolved through a process of accumulation from above, resulting in the current concentration and highly developed productive capacity of the large-scale commercial farming sector. Market liberalization in the 1980s and 1990s modified or eroded these 'Prussian' features, but did not alter the underlying distribution of power and resources. The agrarian question *of the dispossessed*, however, has not been resolved, and to this extent the national democratic struggle remains incomplete.³ Contesting the 'monopolistic position of white farming and corporate capital', as well as those of the 'historic structures of chiefly and bureaucratic power' in the former reserves, together with land reform, will help to create the conditions for more diverse forms of commodity production and processes of accumulation from below (*ibid.*, 40).

Since land reform in post-apartheid South Africa is state-directed, it is also likely to generate opportunities for accumulation from above, with would-be accumulators gaining access to land and other resources through political (extra-economic) connections or even coercion. As Mamdani emphasizes, the distinction between local capitalists whose wealth is created within competitive market relations and those who begin to accumulate through a state connection is '... a relative one. No Chinese wall separates them' (Mamdani 1987, 220). Mamdani's Ugandan case study shows how bureaucrats and others with state connections can wield considerable power within local contexts, and their accumulation strategies often involve a range of enterprises, notably trade, and not only in agriculture (*ibid.*, 206–9).

Rural Class Formation in the Context of Migrant Labour

Accumulation from above and below involves stratification into different class identities, but a simple typology of rich, middle and poor peasants is difficult to apply in any straightforward manner in the Southern African context. This is because capitalist development involved the creation of circumscribed 'native reserves' alongside the appropriation of large areas of

³ This formulation explicitly invokes the political problematic, and helps to explain the continuing resonance of the land question in South Africa today.

productive land for an emerging (white) capitalist farming class, constraining the emergence of (black) petty commodity producers (see the introduction to this issue). O'Laughlin's (1996) critique of the shortcomings of dualist perspectives on the agrarian question in Mozambique highlights the complexity of class dynamics in the rural areas of the region. In a nuanced analysis of land and labour regimes in different regions of Mozambique, she calls attention to the diverse ways in which rural people had to organize production and social reproduction as commoditization of the rural economy proceeded. She contrasts systems of migrant mine labour in the south of the country, forced labour for large plantations in the centre, forced cultivation of cotton in the north, the production of hybrid maize for sale by small farmers in areas along the borders of the country, and specialized peasant production of wheat, rice, maize and cotton in specific locations (*ibid.*, 7–10).

Social differentiation of rural households did not proceed in a linear and neatly stratified fashion, but combined two analytically distinct processes: (a) a 'diversification of rural livelihoods' via variable combinations of own production and different forms of wage labour; and (b) 'class stratification', the emergence of sharp differences in control of land, cattle and implements (the means of agricultural production). In O'Laughlin's view, these processes 'may proceed together with the expansion of the market and wage labour relations under capitalist development, but their rhythm is not necessarily the same', and 'colonial policies on land, labour and local governance in Mozambique led to a complex non-dualistic agrarian class structure in which diversification of rural livelihoods outstripped class stratification' (*ibid.*, 6–7). The generalization of wage labour relations meant that most rural households needed income from off-farm employment to establish and maintain agricultural production; this interdependence remains and is a reality across the region (*ibid.*, 35).

Different schemas for assigning class identities to smallholder farmers in Southern Africa have been proposed that take account of the interdependence of wage labour and land-based livelihoods and the hybrid identities that this generates (e.g. Cousins et al. 1992; Levin et al. 1997). Recently, I proposed a typology that distinguishes supplementary food producers, allotment-holding wage workers, worker-peasants, petty commodity producers, small-scale capitalist farmers and capitalists whose main income is not from farming (Cousins 2011a). Such schemas run the risk of suggesting that clearly defined class identities with distinct interests exist or emerge over time, and that they can be readily targeted by specific policies or programmes. An alternative approach is to accept that there is a general tendency to class differentiation, but that it is always mediated by other 'determinations' in particular circumstances, and thus subject to a range of locally specific dynamics, including intersections and combinations of class with other social differences such as gender, age, ethnicity, race, religion and caste (Bernstein 2010, 115). As Peters (2004, 305) notes for the broader African context, 'proliferating tensions and struggles between generations and genders, or between groups labelled by region, ethnicity or religion, are intimately tied up with the dynamics of division and exclusion, alliance and inclusion that constitute class formation'. Also relevant is the generalized fragmentation of 'classes of labour' in contemporary conditions that Bernstein refers to (*ibid.*, 111), which calls attention to both hybrid combinations and fluidity:

Many of the labouring poor [secure their livelihoods] across different sites of the social division of labour: urban and rural, agricultural and non-agricultural, as well as wage employment and self-employment. This defies inherited assumptions of fixed, let alone uniform, notions (and 'identities') of 'worker', 'trader', 'urban', 'rural', 'employed' and 'self-employed' . . .

Growth, Accumulation and Differentiation in Small-Scale Agriculture in Southern Africa

Oya's recent critique of agro-pessimism in Africa cites evidence that agricultural growth rates on the continent have not been as unimpressive as is often assumed, that yield increases as well as land expansion are responsible for such growth, and that significant growth in non-traditional agricultural exports has occurred since the 1990s. There are both supply-side and demand-side instances of success; for example, in high-yielding maize varieties in Eastern and Southern Africa, and in horticultural exports (Oya 2010, 92–4). Some countries have performed much better than others, due to differences in agrarian structures, agro-industrial linkages and policy regimes (*ibid.*, 93), and there is a great deal of unevenness within countries, with a marked 'variety in forms and scales of rural accumulation' (*ibid.*, 96). Oya argues that the dominant form of accumulation has been capitalism from below through smallholder differentiation, but that there is also much evidence of accumulation by members of 'a variety of "ruling" classes, including pre-capitalist landed elites and an urban petty bourgeoisie of bureaucrats, politicians and merchants' (*ibid.*, 97).

The Zimbabwean case is perhaps the most relevant for consideration of the prospects for accumulation in small-scale agriculture in South Africa. In the first two decades of independence (1980–2000), state support for small-scale farming in the former reserves created new opportunities for petty commodity production, particularly in high-rainfall regions. By the end of the 1990s, smallholders produced over 50 per cent of all marketed maize and between 60 and 75 per cent of cotton (Muir-Leresche 2006, 110–11). Income from wage labour facilitated investment in farming, so that 'worker-peasants' as well as petty commodity producers contributed a significant proportion of the crop surpluses now being produced in these areas (Cousins et al. 1992, 18–20). Other producers, such as female-headed households without access to wage income, and those located in semi-arid regions, struggled to reproduce themselves and became dependent on state transfers or family support. Extra-economic factors, such as political connections, facilitated preferential access to resources by village-based elites, often connected to the ruling party, so that accumulation from above occurred alongside accumulation from below.

Resettlement of land acquired by the state in Zimbabwe between 1980 and 2000 allowed many, but not all, households getting land to begin to build larger herds of livestock and to cultivate larger areas of crops than they were able to before, and to increasingly produce surpluses for sale (Kinsey 2004, 1688). More recently, the fast-track land reform programme from 2000 has redistributed at least twice as much land as earlier programmes. By 2008/09, around 4,500 large-scale commercial farms had been redistributed to over 145,000 households in A1 resettlement schemes, where smallholder production predominates. Another 16,500 beneficiaries were allocated medium-scale, commercial farms under the A2 model. Moyo (2011a: 497) suggests that the total land area redistributed through fast-track and reform is now over 9 million hectares. According to Moyo (2011b, 944–7), the new agrarian structure comprises an expanded peasantry, which is subject to internal differentiation, expanded numbers of middle-sized capitalist farmers, and reduced numbers of large-scale capitalist farmers and agro-industrial estates, plantations and conservancies. Including communal areas and pre-2000 resettlement schemes, 98 per cent of all farms in Zimbabwe can now be classified as smallholdings (Scoones et al. 2010, 6).

Fast-track land reform has been accompanied by class differentiation. The Masvingo study by Scoones et al. (2010) suggests that around one-third of fast-track land-reform beneficiaries are beginning to engage in accumulation from below (described as 'stepping up'), whereas others have had to diversify their livelihoods ('stepping out') or are just 'hanging in', while

another 10 per cent are struggling to survive and are described as 'dropping out'. Here, both diversification of livelihoods⁴ and class stratification, as discussed by O'Laughlin, are clearly occurring in tandem, but fixed and uniform class identities are difficult to identify.

Accumulation from below on a significant scale in the Southern African context thus requires the redistribution of commercial farms to small-scale producers, but this is not sufficient: access to other resources is also required, including capital to invest in farming, with off-farm income an important potential source of such capital. Seventeen years ago, Bridget O'Laughlin argued that 'resolution of the agrarian question in Mozambique, as in the rest of Southern Africa, requires not only land reform but a strategy for the global transformation of the class structure of the migrant labour system' (O'Laughlin 1996, 35). Today, massive levels of unemployment, not least in the industrial powerhouse of the region, South Africa, mean that the current class structure includes a large 'surplus' population, in both urban and rural locations. Transformation must therefore include job creation on a very large scale. In this perspective, an agrarian reform that promotes accumulation in small-scale agriculture is feasible only in the context of a broader socio-economic transformation, but can also make an important contribution to it.

SMALL-SCALE FARMING AND RURAL LIVELIHOODS IN SOUTH AFRICA

The character of rural poverty in South Africa is both similar in some respects to that found elsewhere in the region and notably different in others. The key distinguishing features of rural livelihoods in South Africa today are the relatively low contributions of small-scale farming to total income, declining proportions of income from wages and remittances in recent years, and the increasingly large contribution of state transfers (in the form of social grants). Most striking is the deep-seated and long-standing generalization of wage relations in black rural areas, but within this general pattern some key spatial (regional and local) differences can be discerned in relation to the contribution of small-scale farming to diverse rural livelihoods.

Aliber et al. (2009b, 4–7) summarize the best available national data on the scale and nature of small-scale agriculture in South Africa.⁵ About 4 million black individuals from about 2.5 million households practise some form of farming. The five main reasons for engaging in agriculture are: farming as a main source of food; as an extra source of food; as an extra source of income; as the main source of income; and as a leisure activity or hobby. Around 92 per cent practise agriculture as a source of food or as a leisure-time activity, and around 10 per cent do so as their main source of food. Only 8 per cent do so as a main or extra source of income (ibid., 5). The authors use these data to distinguish between a large mass of 'subsistence-oriented smallholders' and a smaller category of 'commercially oriented smallholders', numbering around 320,000.

Disaggregating these data, women make up 61 per cent of all those involved in farming, and are particularly dominant in relation to engaging in farming 'as an extra source of food'. Black smallholders are concentrated in twelve district municipalities, all except one being in three

⁴ Scoones et al. (2010, 166–87) note the continuing importance of diverse sources of off-farm income for land-redistribution beneficiaries. Between 2000 and 2010, because of the severe decline of the economy and loss of formal-sector jobs, other important sources included cross-border trade, petty craft and artisanal enterprises, natural resource harvesting and remittances from family members located outside the country. (Considerable numbers of Zimbabweans are now living in South Africa, Botswana and other neighbouring countries, as legal or illegal immigrants, or refugees.)

⁵ Available from the Labour Force Survey (LFS), conducted twice a year by Statistics SA.

provinces with large rural populations, the Eastern Cape, KwaZulu-Natal and Limpopo. In four of these twelve districts, the proportion of black households engaged in agriculture is between 57 and 72 per cent, and in the other eight the share is between 43 and 56 per cent. Using the same data set, Aliber and Hall (2010, 14) show that in 2006 the average per capita income per annum was around R4,600 for households whose farming is their 'main source of food', compared to nearly R9,000 for those who farm because it is their 'main source of income'. They note that this may be because households that are wealthier to start off with are more likely to produce more and earn more from farming.

Most rural survey data in South Africa show that farming contributes a relatively small share of total household income, and is generally combined with a range of other livelihood sources. For example, May (2000, 26–7), analysing a 1993 survey, identifies the following eight 'livelihood strategy classes': marginalized households without access to wages, remittances or welfare transfers (for whom small-scale agriculture makes up 81 per cent of income); welfare-dependent households; remittance-dependent households; secondary wage-dependent households;⁶ primary wage-dependent households; mixed-income households with secondary wages; mixed-income households with primary wages; and entrepreneurial or self-employed households (for whom agriculture makes up 32 per cent of income). A third of all households were wage-dependent, another quarter was remittance-dependent, and 11 per cent were welfare dependent at that time.⁷ May comments that 'agriculture thus seems to play a dual role, as a safety net and as a way of deriving an entrepreneurial income' (*ibid.*, 27).

Shackleton et al. (2000) argue that these kinds of survey data fail to capture the full value of land-based livelihoods. Crop yields, the full economic value of multiple-function herds of livestock and the significant contribution of natural resource use are often underestimated or ignored because of flaws in survey design and data collection. They quote McAllister's study of cropping in one area of the former Transkei, which shows that if properly measured, maize yields on intensively cultivated homestead plots (so-called 'gardens', often a misnomer since they can be over a hectare in size) average around 1.8 tonnes per hectare, which compares favourably with yields on large-scale farms (McAllister (2000, 15). Andrew and Fox (2004) analyse a series of aerial photographs of McAllister's study site, which show clearly a long-term and widespread shift of crop production from fields, often located at some distance from the homestead, to homestead 'gardens', and explore the reasons. Intensified production in homestead gardens is 'more productive, less risky and more viable, given the resource constraints faced by rural households' (*ibid.*, 704). Resource constraints were not evenly distributed, however, and poorer households were the first to make the shift to garden cultivation. They cite Heron's (1991) study from a nearby site in the former Transkei, which showed that wealthier households were better able to recruit labour for work parties because they had more beer to offer, and more cattle to plough with and to offer to co-operative groups known as 'ploughing companies'.⁸

Shackleton et al. (2000, 51–5) review the literature on livestock production, and show that in communal areas most herds of cattle, sheep and goats are multiple-purpose in character, yield high economic returns per hectare when appropriately valued, and make an important

⁶ 'Primary' and 'secondary' labour markets distinguish between those in which jobs are well-paid, secure and offer opportunities for upward advancement, and those in which jobs are low-paid, insecure and have few such opportunities (May 2000, 25).

⁷ Subsequently, there was a massive expansion of the population receiving social grants (see the Introduction to this special issue).

⁸ Fay and Palmer (2000) describe broadly similar patterns in another site in the former Transkei, but with significant differences between nearby villages, illustrating the importance of local conditions and histories.

contribution to rural livelihoods. However, ownership is highly skewed; in many areas less than a third of households own cattle, and households with higher levels of off-farm income, such as local businessmen and government bureaucrats, as well as salaried traditional leaders, account for a disproportionate percentage of cattle.

A number of studies have explored the widespread underutilization of arable land in communal areas (of fields as opposed to 'gardens'). Andrew et al. (2003) identified the following factors: shortages of labour, draught oxen, capital and income to purchase inputs; poor supply of inputs and tractor services; soil erosion and declining soil fertility; high risks of crop damage due to a shortage of herding labour and fencing; a lack of markets due in part to the withdrawal of traders from these areas, as well as increased competition from the large-scale commercial farming; and declines in co-operative activities such as work parties, due to increasing inequalities and the declining availability of labour, livestock and finances. Other studies found that lack of cash to purchase inputs is a major constraint, although the increased availability of social grants has mitigated this to a degree (Altman and Boyce 2008). Aliber and Hall (2010, 19) suggest that the absence of accepted arrangements for sharecropping or rental of underutilized land is another key constraint.

These research findings suggest that most small-scale farming in South Africa is practiced to supplement household food supply, and only a small proportion of the product is sold. They also suggest that class differentiation exists – as reflected in differential levels of production and sales, as well as holdings of assets such as livestock – but it is limited in its extent. Class relations in the countryside are thus expressed more clearly in the 'diversification of rural livelihoods' (O'Laughlin 1996) and the 'fragmentation of classes of labour' (Bernstein 2010) than in the emergence of a layer of agricultural petty commodity producers or small-scale black capitalist farmers who make major contributions to national agricultural production, as occurred in post-independence Zimbabwe, for example.

SMALLHOLDER IRRIGATION SCHEMES IN SOUTH AFRICA

The agricultural potential of most land in South Africa is limited, with over 60 per cent of the country receiving less than 500 mm of rain per annum on average, and with only 10 per cent receiving more than 750 mm (World Bank 1994, 28). Rainfall is unreliable, droughts are common and crop production in most of the country is inherently risky, making irrigation important for a range of field and tree crops. As noted above, it is potentially a key focus of land and agrarian reform. About 1.3 million hectares, or under 10 per cent of all arable land, is under irrigation at present. In the past, the distribution of irrigation water was as inequitable as the distribution of land, with white commercial farmers holding rights to over 90 per cent of the water supply, supported by massive state investment in irrigation infrastructure. Little has changed since 1994, despite new laws that have separated land and water rights and declared water a national resource, and there has been no attempt to date to integrate land and water reform (van Koppen et al. 2009). Around 7.7 per cent of irrigated land, or 100,000 hectares, is used by smallholder farmers, mostly in the former Bantustans (Van Averbeke and Khosa 2011, 145). Around half of this consists of small home gardens, and the other half is located on smallholder irrigation schemes, of which there are 317 in total. Denison and Manona (2007, 11) estimate that there are about 33,000 plot holders on these schemes, each cultivating an average of around 1.5 hectares. Over one-third of the schemes, and over half of those in Limpopo Province, were inactive in 2007.

Van Averbeke and Khosa (2011, 146–9) outline the history of smallholder irrigation schemes in South Africa, and distinguish three main phases. In the canal scheme phase (1930–69),

segregation and apartheid-era government policies aimed to support 'full-time farmers' on small plots, and seventy-four schemes were constructed. Most schemes were gravity-fed, using diverted water from a weir on a river to supply plots via canals and furrows, and plots ranged from 1.2 to 1.7 hectares. So-called 'Trust tenure' was administered by the South African Development Trust, allowing the state to 'enforce the production objectives of the scheme by evicting poorly performing farming families' (ibid., 146). From 1970 to 1996, these schemes were administered by Bantustan governments, and a further sixty-two were established, including several very large schemes over 500 hectares in size. The prevailing ideology was one of 'modernization' through the promotion of commercial farming, and expensive systems of pressurized overhead irrigation were generally installed. The large schemes often included a central commercial estate operated by a Bantustan parastatal, a 'commercial smallholder' component on mini-farms of 5–12 hectares, and a 'subsistence' component on small food plots of 0.1–0.25 hectares.

Financial and institutional support was withdrawn when the Bantustans were reincorporated into democratic South Africa in 1994. In some schemes, a near-immediate collapse of production occurred soon after the dismantling of the agricultural parastatals. According to Perret (2001, 2), many schemes in Limpopo had been inactive for some time, as a result of poor planning and design, inappropriate management structures, lack of technical knowledge, insecure land tenure, political interference, the absence of opportunities for farmers to participate in decision-making and 'a history of dependency'. In a transitional phase between 1990 and 1996, over sixty new small-scale schemes, of around 39 hectares on average, were established (van Averbeke and Khosa, 147). From 1997, policy focused on the transfer of management from government to plot holders and the rehabilitation of infrastructure, in line with the Irrigation Management Transfer (IMT) approach that international agencies have promoted in recent years. In Limpopo, a WaterCare programme focused on thirty-four schemes between 1998 and 2004, and evolved into a Revitalization of Smallholder Irrigation Schemes (RESIS) programme, with a budget of R1 billion over 5 years and targeting 126 schemes (Denison and Manona 2007, 5–44). It sought to combine rehabilitation of infrastructure with support for institutional development and the promotion of joint ventures and strategic partnerships (ibid., 15).

From 2005, the Limpopo RESIS programme was renamed RESIS Recharge, and emphasis shifted towards the installation of high-tech irrigation technologies such as micro-irrigation and floppy sprinklers (despite clear evidence of the high levels of efficiency and cost-effectiveness of short-furrow irrigation), and joint ventures with large-scale commercial farmers or companies (van Averbeke and Khosa, 148). Joint ventures and contract farming arrangements on these schemes have often resulted in negative outcomes for plot holders (Denison and Manona 2007, 42; Tapela 2008). In some cases, they have given their plots entirely over to large-scale commercial farmers or companies in exchange for a share of their profits. Overall, this brief history reveals that the management of smallholder irrigation schemes in South Africa has generally been highly authoritarian in character, with control shifting from the state to the private sector in the post-apartheid period. In some of the older gravity-fed schemes, however, farmers have simply been left to manage as best they can, without much external support.

Social Differentiation on Smallholder Irrigation Schemes

Case studies of gravity-fed, canal and furrow schemes in Limpopo Province offer interesting comparisons with the Tugela Ferry scheme discussed below, in relation to levels of productivity and income but also social differentiation. Lahiff (2000) examined a large (1,150 hectares, 930

plots) gravity-fed furrow irrigation scheme at Tshiombo in Limpopo, holdings on which in the mid-1990s ranged from 1.2 to 7.2 hectares, and most producers sold at least half of their total output. Despite a policy of allocating only one plot per producer, by 1995 over a third of producers were cultivating two or more plots, and 10 per cent had between three and six plots (*ibid.*, 172). Smaller producers consumed most of their output, but larger producers grew particular crops (such as green maize, cabbages, tomatoes, sweet potatoes, spinach, groundnuts and chillies) specifically for sale. The most common crop amongst all producers was summer maize, grown for home consumption. There were also a substantial number of informal irrigators, utilizing 'wasteland' adjacent to rivers, who tended to have a strong commercial orientation, the majority stating that farming was their main source of income. One farmer planted 5 hectares of tomatoes on contract to a processing factory.

Lahiff estimates that only a quarter of the plot holders on the Tshiombo scheme produced crops with a gross value of over R5,000 per annum, equivalent to an unskilled worker's wage in the mid-1990s. For the majority of farmers, income from cropping represented less than half of total income, with other income from wages, remittances, old age pensions and petty trading (*ibid.*, 182). Only 6 per cent produced crops with a gross value of more than R11,000 per annum. These larger producers concentrated on high-value crops such as tomatoes and green maize, and planted larger areas of 0.5 hectares or more. They tended to be men who owned their own vehicles and sold produce to both informal and formal markets within a large geographical area, whereas smaller producers relied mostly on sales to hawkers or local consumers. Over a third of plot holders on Tshiombo, and many of the larger 'informal' irrigators, hired in labour from landless or near-landless households, generally one worker at a time for set tasks such as planting, weeding or harvesting, and wage rates were very low, around R100–200 per month in 1995 (*ibid.*, 172). Larger producers sometimes hired between three and five workers at once. Lahiff suggests that the primary basis for social differentiation at Tshiombo was unequal access to and control over land, labour and capital, mediated by land tenure relations and shaped to some extent by political affiliation and access to state resources.

Van Averbeke and Mohamed (2006) and van Averbeke and Khosa (2011) use the notion of farming styles to identify significant differences amongst farmers on the gravity-fed Dzindzi irrigation scheme, described as 'typical' of smallholder schemes in Limpopo. Dzindzi was established in 1954, extends over 135.6 hectares, and is subdivided into 106 plots of around 1.3 hectares, held by 102 farmers (*ibid.*, 152). Renting-in land was not permitted in the past, but this practice has emerged strongly in recent years, leading to different 'farm sizes' amongst farmers. The main crop grown is maize, both for grain (mostly for home consumption) and as green maize, meeting a strong market demand; other vegetable crops include cabbages, tomatoes, green peppers, sweet potatoes and 'African leafy vegetables'. Only twenty of the ninety-seven households in the survey obtained more than half of their income from farming, and using main source of income as the key criterion, five 'livelihood types' are distinguished: social grant holders (37% of the total), employers (22%), farmers (21%), petty entrepreneurs (11%) and diversified-income households (9%) (*ibid.*, 154).

Three distinct 'farming styles' were identified: (a) *food farmers* (45% of the total) produced low-cost food, concentrating on maize grain for their own consumption, and using funds from other sources, such as social grants, to purchase inputs; (b) *employers* (17%) hired farm workers to undertake cropping, since they were engaged in other livelihood activities, or were too old to farm, recovered some of the costs of such labour through sale of produce and had household food security as their main objective; (c) *profit-makers* (17%) farmed to earn cash income and focused on producing high-value crops such as cabbage, despite the risks

involved, and green maize. They relied mainly on family labour, but hired casual labour on a piece-work basis in peak labour periods. Twenty farmers (21%) could not be easily classified and were designated 'other'; they seemed to represent transitions between farming styles (van Averbeke and Mohamed 2006, 144). In 2008, nine selected farmers (comprising four profit-makers, three 'others', one employer and one food farmer) provided gross margin data for their farming enterprises as a whole for the previous year (van Averbeke and Khosa 2011, 158). Total gross margins ranged from a minimum of -R244 (i.e. a loss) to R28,244, with a mean of R10,368.

These studies suggest that there may be a higher degree of class stratification amongst small-scale farmers on irrigation schemes than where only dryland agriculture is possible. Productivity appears to be reasonably high and a combination of formal and informal markets for high-value fresh produce appears to offer opportunities for small-scale commercial farming for a sizeable proportion of plot holders.

TUGELA FERRY IRRIGATION SCHEME

Tugela Ferry Irrigation Scheme is located in the Midlands region of KwaZulu-Natal, falls within Msinga local municipality, and is close to the small town of Tugela Ferry. Msinga comprises densely settled communal areas with a long history of out-migration in search of waged employment. As elsewhere in rural South Africa, livelihood sources include cropping and livestock production, wage labour on large-scale commercial farms, migrant labour in cities such as Johannesburg and Durban, and remittances (Cousins 2011b, 12). A few households operate small-scale local enterprises, such as tuckshops or local taxi services. Child support grants and old age pensions are an important source of income for many.

Msinga is situated in a dry to semi-arid zone, with a mean rainfall of 600–700 mm per annum and very high summer temperatures of up to 44°C. In some parts of the district, multiple-function livestock production of cattle and goats dominates; in others, production systems are agro-pastoral in character and extensive dryland cropping of maize, sorghum, pumpkins, beans and groundnuts is practised; in a few areas, cash crops are grown under irrigation. A 2009 survey of 1,000 women in seven wards in Msinga reports that 33 per cent of households had access to garden plots and 36 per cent to fields, and that 22 per cent of respondents said that their households produced half or more of their food themselves (Budlender et al. 2011, 85, 98).

The irrigation scheme is amongst the largest in the province, one of only four greater than 500 ha in extent, and covers an area of 840 hectares of high-potential soils. Around 540 hectares are currently under cultivation by between 800 and 1,000 producers (EVN Africa 2010, 5), who probably comprise 15 per cent of all smallholder irrigation farmers in the province. Water is drawn from a diversion weir across the Thukela River and distributed via a main canal, holding dams and smaller distribution canals. Within the beds, crops are irrigated using the short-furrow system. Siltation, cracks, leaks and dysfunctional holding dams, the result of inadequate maintenance and repair work since the 1960s, are major problems. A R20 million government-funded repair programme is currently under way, under the auspices of the Comprehensive Rural Development Programme.

The scheme was constructed by the Natal Native Trust between 1898 and 1902 and has been operational ever since; it was described at the time as 'an oasis in the desert'.⁹ The

⁹ See the *Blue Book on Native Affairs* (Colony of Natal 1902).

objective was to support crop production by Africans for both domestic consumption and sale, but for much of the twentieth century it appears to have been used primarily to produce crops such as maize, pumpkins, beans and sweet potatoes for home consumption. The area has an annual rainfall of 651 mm, droughts are frequent, arable land is in short supply, and irrigated plots were used mainly for household food production until the early 1980s, when large numbers of fresh produce traders, with pick-up trucks, began to purchase crops for retailing further afield. Plot holders responded quickly to market demand and production switched from crops for household consumption to lucrative cash crops such as green maize, in which the area has an early season comparative advantage. In contrast to the Bantustan-era smallholder schemes described above, farmers here do not hold standard plots of around a hectare, but cultivate variable numbers of small individual 'beds', or plots. These range from 0.08 to 0.15 hectares in size, with a mean of around 0.1160 hectares.¹⁰

Land Tenure

Land-tenure systems in the communal areas of KwaZulu-Natal, including Msinga, are 'customary' in character and overseen by chiefs (*amakhosi*), together with traditional councils established under recent legislation (Cousins 2007, 2011b). Most respondents assert that rights to plots on the irrigation scheme are administered by the chief in accordance with 'custom'. However, government officials have always played a role in the allocation of irrigation scheme plots, and in recent decades local farmers' committees have also been given an oversight role, for example, in ensuring that all plots are used productively. Nevertheless, rights to plots are socially and politically embedded. Most farmers have inherited their plots, although some are occasionally reallocated to others, who approach the chief through one of the committees and pay a *khonza* (affiliation) fee. Plots are considered to be family rather than individual property, but control of production and income is controlled by the individual user. Most irrigation farmers are women, and many obtain rights to plots through marriage. Many women say that they were 'given' their plots by their mothers-in-law, and reallocation within extended families is common. An informal, unregulated land rental market helps to ensure that most plots are cultivated in most years. Some plot holders lend unused plots to relatives or neighbours so that they are seen to be under cultivation, thus avoiding reallocation to others, and the borrower of the plot may be required to offer some produce to the holder. A common arrangement involves a plot borrower providing some labour on other plots still used by the lender, or paying the ploughing costs of the lender. In many cases a cash rental is paid, ranging between R150 and R200, either per crop planted or per annum. The mean number of plots held by farmers in their own name is three, with a range of between 0 and 16, and a mean of 1.3 additional plots is borrowed or rented in (ranging from one to nine). An overall mean of 4.3 plots per farmer is cultivated (with a range of from one to twenty plots).¹¹

Anecdotal evidence suggests that members of the chief's family may have use of slightly more plots than most farmers, and this may also be true of committee members in one irrigation block, where an electrical pump, rather than a canal, is used to supply water. There are no obvious differences between these plot holders and others in relation to production systems, hire of labour or methods of marketing.

¹⁰ Median measures are reported in this paper only when there are significant differences compared to the mean; that is, when there is a skewed distribution.

¹¹ Data on numbers of plots are derived from a household survey of 171 households with plots, together with 106 individual crop record sheets.

Production and Marketing

The main crops grown on the scheme are green maize, tomatoes, sweet potatoes, cabbages, spinach and other green leafy vegetables, with much smaller quantities of beans, butternut squash, green peppers, potatoes, onions and peas. It is possible to cultivate three crops a year on a single plot, and many farmers do so, but others leave at least some plots empty in the winter months, when frost may occur. Almost all farmers plant early green maize to benefit from the crop's comparative market advantage. A common crop rotation involves growing maize from August to December, a summer crop such as tomatoes from January to April and a winter crop such as cabbages or spinach from May to August.

Tasks such as clearing, weeding, watering and harvesting are undertaken using hand tools. Often, the farmer's labour is supplemented by that of family members, or by hired-in labourers drawn from local households (including many that do not have access to plots of their own). Many crop protection chemicals are applied using knapsack sprayers, which are expensive and owned by only a minority of plot holders, who often lend their sprayers to neighbours and relatives. Most ploughing is done by hired-in tractors owned by the government. Farmers make heavy use of purchased inputs such as seed, seedlings, fertilizers and crop protection chemicals. These constitute major costs for crops such as tomatoes and cabbages, which are also subject to market gluts, and together these factors increase the risks of growing such crops. Maize and sweet potatoes use fewer purchased inputs, a key reason why they are widely grown.

Green maize from the scheme is sold as far afield as the main cities in the province (Durban and Pietermaritzburg), and in smaller country towns within a radius of 100–200 kilometres. Crops are also purchased in large quantities by traders, or transported by farmers, using taxis or hired vehicles, to small towns for sale to hawkers. Many farmers use cell phones to liaise with potential buyers. Farmers also sell produce directly to roadside hawkers in Tugela Ferry itself, sell their own produce at the roadside and supply local consumers from areas of settlement close to the scheme. Market gluts are fairly common for crops such as tomatoes and cabbages, the result of high levels of local production, but also competition from large-scale commercial farmers elsewhere in the province. Although almost all crops are grown for sale, small amounts are generally taken home and consumed by family members.

Most purchased crop inputs are available locally, although some (e.g. seedlings) have to be accessed from suppliers a considerable distance away, reducing reliability and raising costs. The upstream and downstream components of this fresh produce value chain create a small number of employment opportunities in the immediate vicinity of the scheme, with perhaps 30–40 female hawkers in Tugela Ferry town and two local inputs suppliers.

The Economics of Crop Production

Detailed data were collected on 106 individual crops grown between 2009 and 2011, comprising crops of green maize, tomatoes, sweet potatoes, cabbages, beans, onions, spinach and butternut squash. All except eight farmers (7.5%) had some plots in their own name, and fifty-four farmers (51%) borrowed or rented in plots, mostly from relatives (52%) or from other farmers (38%). Labour was hired in on a piece-work basis for 77 per cent of the crops and generally paid in cash, except in relation to harvesting and marketing, when payment was mostly in the form of crop produce. Gross margins, both positive and negative, for the four main crops represented in the sample are given in Tables 1 and

Table 1. Positive gross margins for maize, tomato, sweet potato and cabbage crops

<i>Crop</i>	<i>Number of growers making a profit, n</i>	<i>Profit-makers as proportion of all growers (%)</i>	<i>Positive gross margin (mean) (R)</i>	<i>Positive gross margin (median) (R)</i>	<i>Range (R)</i>
Maize	30	91	1,439	1,344	208–2,916
Tomatoes	12	46	3,166	3,545	17–7,163
Sweet potatoes	16	73	1,172	1,243	240–2,785
Cabbages	5	56	3,840	4,450	1,394–5,146
All four crops	64	71	1,868	1,367	17–7,163

Table 2. Negative gross margins for maize, tomato, sweet potato and cabbage crops

<i>Crop</i>	<i>Number of growers making a loss, n</i>	<i>Loss-makers as proportion of all growers (%)</i>	<i>Negative gross margin (mean) (R)</i>	<i>Negative gross margin (median) (R)</i>	<i>Range (R)</i>
Maize	3	9	340	106	208–2,916
Tomatoes	14	54	790	782	15–898
Sweet potatoes	6	27	300	355	9–1,790
Cabbages	4	44	300	355	410–997
All four crops	26	29	644	577	9–1,790

2.¹² These show that maize and sweet potatoes are more reliable crops than tomatoes and cabbages, but are also potentially less profitable. Of these ninety individual crops, over 70 per cent were profitable, and in the case of some tomato and cabbage crops, highly profitable, with average gross margins of over R3,000 per crop.

Annual income from irrigated cropping can be estimated by extrapolating from these data. Assuming a net gross margin of R783.80 per crop, from four plots, growing an average of two crops per annum, the mean annual gross margin per farmer is R6,270.40 (from 0.4640 hectares), or R13,544 per hectare. This is slightly more than the mean of R12,062 per annum per hectare for the nine farmers in Dzindzi Irrigation Scheme reported by van Averbek and Khosa (2011, 158). Larger and generally successful producers, who are more likely to grow lucrative but risky crops, have the potential to earn considerably more: assuming a positive gross margin of R1,500 per crop from six plots and two crops per annum, these farmers could earn an annual income of R18,000, or R25,920 per ha per annum, very similar to that earned by the most successful farmer in the Dzindzi scheme (R25,461 per ha per annum).

The key features of irrigation farming in the Tugela Ferry scheme are similar in many ways to those found in other low-cost, gravity-fed systems schemes in South Africa: plot sizes are

¹² Gross margins were calculated by subtracting crop-specific costs from gross returns, a negative gross margin indicating that a loss had been incurred. Income from the crop included an estimate of the cash value of crops consumed by the farmer's family or given to others as gifts. Labour costs included the cash value of produce used to pay workers, but not the imputed cost of the farmer's or the family's labour. Gross margins did not include a share of fixed or overhead costs, such as maintenance, repair or replacement of tools and equipment, due to lack of data.

Table 3. Income sources for adult household members, in households with plots in Tugela Ferry irrigation scheme ($n = 171$) (multiple responses)

	<i>Males</i>		<i>Females</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Permanent job	47	27.3	51	10.0	98	14.3
Temporary or casual job	33	19.2	26	5.1	59	8.6
Farming on household land	38	22.1	188	36.7	226	33.0
Self-employed, no employees	10	5.8	5	1.0	15	2.2
Self-employed, employees	6	3.5	2	0.4	8	1.2
Pension	22	12.8	69	13.5	91	13.3
Disability grant	7	4.1	8	1.6	15	2.2
Child support grant	4	2.3	138	27.0	142	20.8
Remittance (cash or kind)	5	2.9	25	4.9	30	4.4
Total	172	100.0	512	100.0	684	100.0
Gender distribution	25.1%		74.9%		100%	

small and their distribution is fairly equitable; production systems are highly labour-intensive; common cash crops include green maize, tomatoes, cabbage, sweet potatoes and leafy green vegetables; and production of specialized types of fresh produce for niche markets is absent or very limited (see Lahiff 2000; Denison and Manona 2007; van Averbeké and Khosa 2011).

Tugela Ferry also has some distinctive features: the great majority of plot holders are women rather than men; the production of food crops for home consumption is limited and the bulk of production is for sale; almost all crops use costly fertilizers and crop chemicals; the use of hired labour is common; individual plots (or ‘beds’) are much smaller than on other schemes; an active, informal plot rental market makes it possible for many farmers to gain access to additional plots; and the land rental market means that most plots remain in cultivation in most years. Cropping here can be described as highly commoditized, in relation to both inputs (including labour) and outputs, with land only partially commoditized (in that plots cannot be sold) but nevertheless subject to a great many informal transactions between owners and others who gain ‘temporary’ use rights.

Diversified Livelihoods

Farming is only one of several sources of livelihood for farmers on the Tugela Ferry scheme. This is clear from a recent household survey, which allows for an initial analysis of social differentiation.¹³ Sources of livelihood within surveyed households are shown in Table 3, which reports all income sources for all adult household members. Given that only households with plots on the scheme were included, it is not surprising that farming on household land, at 33 per cent of all income sources, is the single most important source. The next most important sources are child support grants, jobs and old age pensions, with few remittances in cash or kind being reported. A small number of those with permanent jobs are employed locally (e.g. in

¹³ A sample of 171 households with plots on the scheme was surveyed, constituting between 17 and 23 per cent of the population who have plots on the scheme (depending on the total population, for which only rough estimates are available).

schools, hospitals or other government jobs) and are present all or most nights. This category constitutes 17 per cent of men with permanent jobs, and 38 per cent with temporary or casual jobs. Many men over the age of 30 and under the age of 60 are absent, either in employment or looking for work. A small number of households have members who operate small businesses such as shops or taxi operations, with or without employees.

Important gender differences in relation to sources of income are evident. Because most irrigation plot use is by women, farming is the most common source of income for women (constituting over a third of all income sources), higher even than child support grants (27% of the total). Permanent, temporary or casual jobs are proportionately more important for men than for women, but the total numbers of men and women holding such jobs is almost equal (eighty and seventy-seven, respectively). Three times as many women as men receive old age pensions, but pensions contribute a similar proportion of total income sources for each gender. The most striking finding is that the total number of income sources for women (512) is three times the number for men (172), mainly because of the large numbers of women engaged in farming and receiving child support grants, but also because more women than men receive old age pensions.

The mean number of income sources per household is 3.25. Over a third of households have members in permanent jobs, and around a quarter have members in temporary or casual jobs. Farming is a source of income for only one household member in over two-thirds of households with plots, and for two members in another quarter (in most cases these are spouses). Over 70 per cent of households receive at least one child support grant, and many receive more than one grant. Around 49 per cent of households receive at least one old age pension.

Levels of asset ownership suggest that most households farming on the scheme are poor; a majority own some domestic goods (such as a stove) and some kind of electronic or communications device (such as a radio or television set), but rather few in number. Only twenty-five households (15%) own a motor vehicle. Almost all households own agricultural tools or machinery of some kind; most of these are hand tools such as hoes, forks or spades, and only 37 per cent own knapsack sprayers. Very few households own a tractor – only three in the sample. A minority of households own cattle, and herd sizes are generally small. Most households own less than six cattle, with only four households owning herds of more than ten animals. Goat ownership is more common, with 60 per cent of households owning some animals, and half of all owning households have herds of ten or more goats. In terms of land, very few households (9%) have fields for dryland cropping, and only 12 per cent have gardens attached to their homesteads. Almost nine in ten households hold one or more irrigation plots in their own name, and over 40 per cent of households borrow or rent in plots.

Table 4 compares demographic features, income sources and levels of asset ownership of two categories of irrigation plot users – those with fewer than six plots in use, and those with six or more plots in use (comprising around 10% of the sample).¹⁴ There are few dramatic differences between smaller and larger cultivators, with the latter tending to own more domestic and transportation assets and having slightly higher numbers of household members in permanent jobs or earning income from farming. Some clear differences do exist in relation to agriculture: large cultivators own more agricultural assets, including knapsack sprayers, and larger numbers of cattle and goats, than smaller cultivators. They grow a slightly larger number of different crop types. None of the larger cultivators rely solely on agriculture, however, and

¹⁴ Comparison between these two levels of plot ownership reveals more significant differences than others (e.g. between owners of less than five and five or more plots).

Table 4. A comparison between smaller cultivators (between one and five plots, $n = 150$) and larger cultivators (between six and fourteen plots, $n = 18$)

	<i>Smaller cultivators (mean per household)</i>	<i>Larger cultivators (mean per household)</i>
Number of income sources	3.22	3.44
Number of members employed in permanent jobs	0.54	0.67
Numbers of members who are self-employed and have employees	0.04	0.33
Numbers of members engaged in farming	1.29	1.5
Domestic assets	1.85	2.94
Transportation assets	0.27	0.72
Motor vehicles	0.17	0.5
Agricultural assets	3.84	6.76
Knapsack sprayers	0.34	0.83
Total assets	6.9	12.00
Cattle	1.42	5.44
Goats	7.30	16.22

several have either permanent jobs or operate small businesses; all receive at least one social grant, either a pension or a child support grant.

Constraints on Accumulation

This case reveals that small-scale farmers on irrigation schemes can achieve reasonably high levels of crop productivity and respond quickly to emerging market opportunities. Successful farmers here have emerged not through a targeted, top-down ‘farmer development’ programme, but through spontaneous local responses to propitious conditions. Informal markets, some local and others further afield, are efficiently supplied by these farmers. Only a few farmers, however, appear to be engaging in agricultural accumulation. The findings reported above suggest that a degree of class stratification in agriculture has emerged in the Tugela Ferry scheme, but that it is limited at present. Differences in household income are as likely to be the result of employment status as due to differential ownership of the means of agricultural production and increased farm income.

There are two key constraints on accumulation. The first is the nature of the property regime. Although the informal land market enables the rental of unused plots, there are strong social sanctions against engaging in this practice on a large scale, and the availability of additional plots is in any case limited by the high demand for them. Land rights are embedded within local social norms and practices, and many plots are ‘lent’ to family members or relatives (albeit, in many cases, in return for some material benefit). Very few farmers cultivate more than five or six plots. The largest plot user recorded in the household survey was cultivating fourteen plots, which amounts to only 1.624 hectares; one of the crop record sheets showed a farmer cultivating a total of twenty plots, or 2.320 hectares. Would-be accumulators are thus constrained by the amount of irrigated land that they can put into production.

A second key constraint is the nature of the fresh produce markets supplied, which are not product-differentiated to any degree: producers grow similar crop types of a generally similar quality, specialization is absent and no lucrative niche markets are supplied. Producers are

dependent on itinerant traders and hawkers as buyers of their produce, and lack the means to engage in sophisticated marketing. Competition in the markets that are supplied is fierce and gluts are common. These factors limit the returns from crop production for most producers, including the larger growers.

The location of the scheme helps to account for these constraints. Msinga displays many of the key features of an apartheid-era labour reserve: high population densities, a general shortage of arable land, poor infrastructure, few local employment opportunities, continuing dependence on migrant wages and remittances and, more recently, social grants, and deep and widespread income poverty (for an overview of 'structural poverty' in such areas, see Philip 2009). In these conditions, it is not surprising that there is a high level of demand for irrigation scheme plots, to enable cash-crop production to supplement other livelihood sources, and that local markets are somewhat undifferentiated. This suggests that accumulation from above or below in places such as Msinga will continue to be constrained until these wider structural conditions can be altered.

CONCLUSION

What are the wider implications of the Tugela Ferry case, taken together with findings from other smallholder schemes, for the debate on agrarian reform in South Africa? Some tentative conclusions may be suggested:

1. Small-scale black farmers can achieve reasonable levels of crop productivity and respond quickly to changing market conditions when they have access to productive resources and markets.
2. Access to soil and water of good quality, and in sufficient quantity, are key resources for successful small-scale farming in South Africa, and agrarian reform must focus on widening access to both. Expanding the supply of irrigation water has the potential to create many new opportunities for such farming, as does the redistribution of commercial farms already engaged in irrigation.
3. Informal fresh produce markets are efficiently supplied by small-scale irrigation farmers, who could probably begin to supply more formal and specialized markets too, but this is likely to require targeted support and interventions (Louw et al. 2007; Baipethi and Jacobs 2009).
4. Property regimes are an important contextual variable, and their social embeddedness is a key feature of rural Southern Africa. There is strong resistance in many areas to individual titling of land, but the Tugela Ferry case illustrates the potential for informal land rental markets to help keep land in production. At the same time, local norms and values may constrain expanded access to land by would-be accumulators. The allocation of larger plots should thus be considered in new smallholder irrigation schemes and on redistributed land, as should institutional support for rental arrangements (Lyne and Thomson 1998).
5. Access to off-farm income is likely to be a prerequisite for successful accumulation in agriculture, and notions of promoting only 'full-time' farmers should be abandoned.
6. Given propitious conditions, successful farmers identify themselves through the way in which they respond to these conditions; attempts to pre-select 'good farmers' or entrepreneurs, as in so many colonial and post-colonial development programmes, is counterproductive.

Accumulation and growth in small-scale agriculture is evident across Africa (Wiggins 2005, 2009; Scoones et al. 2005; Oya 2010) and the Zimbabwean case (above) illustrates how

redistributive agrarian reform can broaden the base for such accumulation. Is this achievable in South Africa, where small-scale farmers must compete with long-established, large-scale capitalist farmers (beneficiaries of a racially based version of accumulation from above), and where the processing and consumption components of value chains are dominated by agri-business (see Bernstein, this issue)? The evidence from Tugela Ferry and other irrigation schemes shows that where they have access to fertile soils, irrigation water and markets, small-scale farmers can be highly productive and earn reasonable returns, and hence the ‘smallholder scepticism’ of scholars such as Sender and Johnson (2004) may be unwarranted. The Zimbabwean example also suggests, however, that accumulation and growth on a large scale require a fundamental reconfiguration of agrarian structure, which has the potential to severely disrupt production, as well as opening opportunities for politically connected elites to engage in accumulation from above.

It is clear that an agrarian reform aimed at supporting hundreds of thousands of existing and new smallholders, and promoting accumulation from below, faces huge challenges in South Africa. Redistributing land on a large scale is clearly insufficient, since farming land productively also requires capital, equipment, labour, inputs, markets and skills. Access to water, via affordable irrigation infrastructure, will be key for many crops and farming systems. Ensuring that all of these resources can be made available on a large scale may be beyond the capacities of the state as it currently functions. Even if agrarian reform is broad-based in nature, a class-analytic perspective suggests that only a minority of small-scale farmers are likely to succeed as petty commodity producers, or make a transition to capitalist farming. Other kinds of economic opportunities, in employment or non-agricultural petty commodity enterprises, are also required to address the crisis of reproduction faced by a large segment of the rural and urban population. An agrarian reform of this kind relies on, and in turn contributes to, a broader social transformation that might not, however, be possible under capitalism in any of its current guises.

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