

URBAN AGRICULTURE AND POVERTY REDUCTION: EVALUATING HOW FOOD PRODUCTION IN CITIES CONTRIBUTES TO FOOD SECURITY, EMPLOYMENT AND INCOME IN MALAWI

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Abstract: Support of urban agriculture can be used as a route to reducing urban poverty across Sub-Saharan Africa. However policy makers require more precise information on how it contributes to alleviating food insecurity and poverty problems. This study in Malawi's two main cities (Lilongwe and Blantyre) revealed two predominant 'types' of urban farmers: (i) low-income, less educated, often female-headed households, who use urban agriculture as an insurance against income losses and who can employ skilled workers to support their livestock activities; and (ii) middle- and high-income, often male-headed households, that undertake urban agriculture for personal consumption and hire significant numbers of unskilled workers. Within the low-income group, there are some female headed-households who are now receiving significant income from livestock programmes having been provided with initial external support from a non-governmental organisation. Our findings suggest a need for a two-pronged policy approach to try and improve the overall effectiveness of urban agriculture support, namely to (1) target poor women with extension and development project support; and (2) support wealthier farmers to increase the employment opportunities associated with urban agriculture. Copyright © 2010 John Wiley & Sons, Ltd.

Keywords: Malawi; urban agriculture; food security; gender; employment and poverty

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1 INTRODUCTION

Food insecurity and unemployment remain pressing problems in many parts of Sub-Saharan Africa (Mougeot, 2005; UN Habitat, 2007), especially in and around the major urban centres (Satterthwaite, 1999; Mougeot, 2005). For example, the Food and Agriculture Organisation (FAO, 2002) suggests about 33 per cent of people in Sub-Saharan Africa are undernourished, whilst the United Nations (United Nations, 2005; UN Habitat, 2007) reports that the urban population in Sub-Saharan Africa is expected to rise from 39.7 to 53.5 per cent of the continent's population between 2005 and 2030. This brings pressing challenges for assuring household food security and alleviating poverty (Haddad *et al.*, 1998; Klemesu, 2000; Frayne, 2005).

Malawi is one of the poorest and least developed countries in Sub-Saharan Africa (World Bank, 2008), and is far from unique in failing to promote food production within cities (Maxwell, 1999; Mougeot, 2005). For example, studies in Nairobi have shown that in urban and peri-urban areas, agriculture is not a recognised land use and there is no category for it in Kenyan urban land use zoning plans (Musonga, 2004). This gap conflicts directly with many efforts from the international donor community. Development programmes such as the Dutch-funded Cities Farming for the Future (CFF), and the Canadian International Development Research Council's AGROPOLIS programme are currently trying to put urban agriculture onto the policy agenda through the development of policy sheets, planning guidelines and direct funding of projects on a range of scales such as the Municipal Development Partnership (MDP) in Southern and Eastern Africa (MDP, 2003).

Urban poverty is also increasing in Malawi and across Africa in general (UN Habitat, 2007), as evidenced by increases in poor quality (slum) housing and in environmentally degraded areas. Against this backdrop, urban agriculture defined as 'food production conducted in or around urban regions' (Mougeot, 2001), seems to provide a realistic and pragmatic solution to urban poverty and food insecurity (Mougeot, 2005; Pothukuchi and Kaufman, 1999). Reports indicate that urban agriculture is an important source of food throughout the urban developing world and is a critical food security strategy for poor urban households (Klemesu and Maxwell, 2000; Mougeot, 2000; Nugent, 2000). Urban agriculture may also improve household nutrition as it provides a source of fresh crops (Mwangi and Foeken 1996) that are rich in key micronutrients in poor households' diets (FAO, 2001; Maxwell, 2001) and it can also increase household incomes (Sanyal, 1985; Smit, 1996; Sabates *et al.*, 2001; Henn, 2002; IFPRI, 2002).

These issues are pressing across Southern Africa in general and particularly in Malawi where persistent poverty and rapid urbanization have brought significant numbers of poor and hungry people into the cities (Kwapata *et al.*, 2001; Manda, 2007). For example, the UN's State of World Cities report estimates that current rural–urban migration rates are 6.3–7.0 per cent p.a., placing Malawi as the fast urbanising country globally (UN Habitat, 2007). Based on the \$1 a day measure, over 55 per cent of the current national population of Malawi lives in poverty (Government of Malawi, 2008), including 25 per cent of the urban population (USAID, 2005). From these statistics, it is fair to assume based on experiences in other Sub-Saharan African urban settings (e.g. Maxwell, 1999; Mougeot, 2005) that increased food production in Malawi's cities could help the chronic problems such as child malnutrition. This could as well reduce the risks of famine-associated mortality and food insecurity such as that witnessed in 2002–2003. Periods of drought in the key maize growing season months (December–February) have further exacerbated food insecurity problems, notably in 2002/2003 when maize output fell to 1.4 million tonnes, significantly

below the estimated national need of 2 million tonnes *per annum*. In 2007, 2008, and first part of 2009, media reports have confirmed that there are still areas where the population has been food insecure despite the success of the agricultural fertiliser subsidy (e.g. Nyasatimes, 2009).

Despite the promise offered by urban agriculture, there is a real gap in Southern African policy support and development practice. For example in Malawian policy, urban agriculture is not yet formalised into policy support either by the national Government or by the City Assemblies. Despite urban agriculture being mentioned within the *Town and Country Planning Act* (Government of Malawi, 1998), there are still no practical regulations to guide and support urban food production. In addition to this, most of the urban land officially earmarked for agriculture (Government of Malawi, 1986), has been converted for other uses such as construction.

One problem is that despite these programmes, there is still a relative dearth of objective information available on who is conducting urban agriculture, and there are relatively few detailed analyses of the extent to which different groups use urban agriculture as part of their livelihood support strategies. Given these gaps, the purpose of this paper is to empirically evaluate the role that urban agriculture plays in urban households in two Malawian cities, Blantyre and Lilongwe. This aims to help inform the sort of policy or development support that could promote urban agriculture as a viable contribution to future poverty reduction, employability and food security strategies of relevance across Sub-Saharan Africa.

2 LITERATURE, CONCEPTS AND OBJECTIVES

This paper is based on two related theoretical bodies of literature. First, this paper assesses food security as defined by the Food and Agriculture Organisation (FAO, 2002) which states that 'food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life' Chapter 2. Second, this paper applies this definition using the tools of the 'sustainable livelihoods approach' that is based on the idea that poor households use a portfolio of assets (e.g. Chambers and Conway, 1992; Chambers, 1989). These assets are made up of both tangible resources (such as land, cash or stores of food) as well as intangible assets like skills and social networks (Rakodi, 2002, 1995). As a result, the literature generally agrees that the sustainable livelihoods analysis, which was originally applied in a rural context (Scoones, 1998), can also be applied in urban areas (Ellis, 1998; Rakodi, 2002).

Although there are considerable links between rural and urban areas in Africa (and elsewhere), and urban residents may have access to land in the country, it is increasingly understood that urban problems are of a different sort than of rural areas. For example, although remittances often flow back from more affluent urban family members to villages in the country (Mkwambisi, 2008), this research did not find evidence of rural families supporting urban residents and this is consistent with studies from elsewhere in Africa that conclude '...rural-to-urban remittances have little impact on the welfare of recipients'. (Boayke-Yiadom and Mckay, 2007, p. 42) but differs from patterns of income flow from rural to urban that have been seen in Namibia (Frayne, 2005). Garrett (2000) suggests that urban-based sustainable livelihood analyses need to be treated with caution since most urban dwellers depend almost entirely on incomes to purchase their food rather than

producing it themselves. Consequently, traditional livelihoods approaches, which often explore factors like the link between land tenure and food security (Maxwell and Wiebe, 1999) are less relevant in urban regions.

To this end, some authors have argued that a dichotomous relationship between the rural and urban economies must be rejected as the two are interlinked and dependent on each other (Baker, 2005). This is of real significance in countries like Malawi where large quantities of rural produce are sold in peri-urban and urban markets to urban residents (Mkwambisi, 2008), but where as yet detailed research or quantification of these flows has not yet been undertaken.

The rural–urban interconnections also include the flow of labour from rural areas to work on small gardens in urban centres (Fraser *et al.*, 2008). Another link that could be of significance is through the supply of agricultural produce from rural and peri-urban areas to urban areas. There is also a link whereby extension programmes are designed in urban areas and delivered to rural areas through development partners such as Non-Governmental Organisations. These links can affect both rural food production as well urban food systems in that many urban residents retain land in rural areas which is used to produce food and to retain secure land ownership rights by using cheap labour (Makoka, 2005; Bryceson, 2006). Baker (2005) further noted that, much rural income is not derived directly from agriculture but takes the form of off-farm and non-farm income sources that depend on urban centres.

This debate links back to earlier food security discussions surrounding Sen's (1981) approach that considers food security as a function of a household's bundle of 'food entitlements'. According to this argument, entitlements are the set of commodity bundles that a person can command in society using the totality of rights and opportunities that they have (Sen, 1981). Broadly speaking, Sen identifies four types of food entitlements. The first is direct or production-based entitlement which occurs when a household consumes the food they directly produce from their farm plots. Secondly, labour-based entitlements can be obtained through working for a wage and purchasing food from the market. Thirdly, trade-based entitlements can be obtained through the sale or barter of assets. Finally, transfer-based entitlements can come through charity or food aid. Entitlement theory, thus describes the sum of the possible methods through which access to food is facilitated. For example, Pearce (1997) indicated that the possibility of food entitlement is created through household production, or through other income-generating activities such as the sale of labour or participation in trading. Seen in this light, Sen's entitlement framework can help us to explore the complexity of urban agriculture.

Entitlement theory can also provide two different types of indirect entitlement, first by providing marketable produce that a poor family could sell for income or second as a source of paid employment for workers on larger-scale urban farms. The extent to which urban agriculture can actually make a difference in terms of different entitlement bundles for the poor and impoverished of Malawi is currently unknown and forms the initial basis of this study.

3 RESEARCH DESIGN AND METHODS

This section outlines the details of the research design and methods followed in this study. It explains some of the key assumptions and implications resultant from the sampling choices made in providing this first assessment of the role urban agriculture plays in

Malawian cities in alleviating poverty, enabling employment prospects and contributing towards reducing food insecurity problems.

3.1 Research design

Research was undertaken with urban communities in Malawi's two main cities of Lilongwe and Blantyre. These two cities are considerably different in terms of socio-economic, environmental and demographic characteristics and they therefore also capture many of the characteristics of, and problems faced by, African cities more widely (Mougeot, 2005).

Blantyre City, with a population of 711 233 in 2005 is the largest commercial and industrial centre in Malawi. It is located in the centre of the southern part of the country. The city covers a total area of 228 km² of hilly ground, and has a temperate climate. The majority (71 per cent) of the city's residents live in unplanned settlements characterised by poor living conditions and the poverty rate in 2005 was assessed at 23.6 per cent (Government of Malawi, 2005).

Lilongwe lies on the Lilongwe-Kasungu plain in the central fertile region of the country at an altitude of 1100 m above sea level. As the capital of Malawi since 1975, the city is an administrative and commercial centre with vast amounts of arable land surrounding it and a relatively low population density. Currently, Lilongwe has 669 021 residents, about 24.6 per cent of whom live below the nationally assessed poverty line (Government of Malawi, 2008).

Within these two cities, a range of low, medium and high-income locations where urban agriculture was practiced were initially identified using Government definitions of these income classification and based on City Planning documents for both Blantyre (GOM, 1999) and Lilongwe (GOM1986). There is a direct (negative) relation between income levels and population density in that, high-income locations have low-density housing and low-income locations have high-density housing. From this planning document analysis and subsequent site visits across the cities, 'typical' locations were selected for further study in consultation with key stakeholders (e.g. Government Planning Officers and NGO staff from Africare International). Following this, contact was established with urban farmers in each neighbourhood through Africare International, an NGO working within urban Malawi and was a partner in this research.

Their input, together with questions asked to all the farmers interviewed (on who else was farming land close to theirs), enabled large numbers of urban farmers to be interviewed (see Table 1 for a breakdown of numbers interviewed). In this way, this study comprises the findings of 330 household interviews aimed at providing an assessment of both environmental entitlements and sustainability livelihood assessments. In this study, agricultural plots were defined as either those within living compounds or those away from their living quarters but within the city boundaries.

3.2 Research methods

To assess urban agriculture's total contribution to food security, surveys were undertaken between September and December 2005 within each of these 330 households. Surveys were conducted by the lead author and postgraduate agriculture students from Bunda College, University of Malawi who were trained in survey techniques. During the survey, informants—the household heads—were asked to quantify the amount of land they

Table 1. Distribution of survey respondents based on location and income status ($N = 330$)

Name of location	Number of respondents and household income status		
	Low	Medium	High
Lilongwe city			
Kauma	20	—	—
Area 23	20	—	—
Area 25	20	—	—
Area 18 and Area 15	—	35	—
Area 47	—	—	35
Area 10, 12, 14 and 43	—	—	35
Blantyre city			
Naotcha	20	—	—
Machinjiri and	20	—	—
Nancholi	20	—	—
Chinyonga/Kanjedza	—	35	—
Soche East/Chitawira	—	35	—
Namiwawa, Chirimba, Nyambadwe	—	—	35
Total	120	105	105

cultivated within the city, what crops they produced, how much harvest they typically obtained and how these crops were cultivated, harvested and then used. To determine urban agriculture's contribution to direct entitlements, informants were asked what proportion of their harvest was consumed by their family.

Two strategies were then used to determine indirect entitlements. First, informants were asked how much (in Malawi Kwacha) of the harvest was sold during 2004/2005 agricultural season. Second, informants were asked whether household members had engaged in paid work on other people's urban agricultural plots and whether they engaged labour to support their urban agriculture activity. If they had, the informants were asked the period of time they were engaged, the type of work, season engaged and amount of money received or paid.

Where necessary to allow for comparison, harvest data from different crops were converted into a cereal equivalent (e.g. crops like sweet potato and cassava are worth 25 per cent of their weight in grain (GM/FAW/WFP, 2004, 2005). Household harvest yields were then compared with the governments' recommendation that everyone should consume 181 kg cereal p.a. χ^2 tests and independent sample t -tests were used to statistically test for difference between household groups (based on income, gender and education) to assess who benefited the most in terms of direct and indirect food entitlements from urban agriculture.

In all cases, data was collected based on the socio-economic and demographic characteristics of urban farmers, farming practices, land ownership and problems faced practicing urban agriculture. Discussions on the constraints faced in urban agriculture focused on perceived environmental problems, policy and regulatory frameworks, urban land supply systems, land value, land tenure and its impact on food production as well as support from institutions and extension service staff (Mkwambisi, 2008). It should be noted that when asking for household incomes and expenditures, many respondents were not able to provide actual numbers and careful questioning was required to quantify the amount of money realised from market participation and other sources such as remittances because

some groups did not regard this as an important source of income. A detailed analysis of the marketing system was also undertaken which involved a daily record of income and expenditure being completed on a pre-designed form throughout the research period to help in determining the actual monetary value and importance of urban agriculture. Finally, information on basic household structure was collected (e.g. the marital status of respondents was 11.5 per cent single, 63.6 per cent married, 15.5 per cent widowed, 4.2 per cent separated and 5.2 per cent divorced).

This research did not identify more complex household arrangements (Adams, 1991; Horrell and Krishnan, 2007), such as women who are single only for a short while. Therefore, the findings provide only broad insights into the relationship between the entitlements from urban agriculture to broad household characteristics, such as gender, income and education status.

Interviews, focus group discussions (FGDs) and workshops were also conducted in low-income locations in each city to source different views from informants and innovative farmers on the constraints faced by the community engaged in urban agriculture using a check list. This allowed individuals to express their views freely in a democratic manner so that the true site-specific situation could be known. To ensure that marginalised populations within each community are given voice, the research conducted separate FGDs with women and men in each community. Information on crop production, fertilizer use, land management, land use systems, household food security, urban environmental issues and livelihood coping strategies were discussed and recorded in these meetings.

All interviews were recorded, transcribed and analysed using a grounded theory approach whereby codes were added to quotes to develop a conceptual understanding of the issues raised. In addition, group interactions in focus group meetings were noted to help to bring out additional information not covered by the questionnaire and provide better-focused set of themes for discussion.

4 FINDINGS AND ANALYSIS

The findings of this study are initially presented in the form of an entitlements analysis with reporting of the direct entitlements (household food production) and then the indirect entitlements (in terms of food sales and then employment prospects) from across the study areas and households. Following this section, a wider holistic discussion of the findings is then provided in the subsequent section.

4.1 Direct entitlements from urban agriculture

Overall, the households surveyed produced an average of 228 kg/capita of cereal (or cereal equivalents), which is above the 181 kg/capita that the Government of Malawi recommends as an adequate food budget (Table 2). This suggests that, on average, the households could support themselves entirely on the food they produce on urban agricultural plots. However, Table 2 also reveals considerable variation between groups, with more educated, wealthier and male-headed households obtaining significantly larger harvests than poorer, less educated and female-headed households.

For example, the 17 households where the household head was 'illiterate' only harvested 68 kg/capita from urban agriculture which is considerably below what they would need to survive, while high-income households harvested 306 kg/capita from their plots. There

Table 2. Urban agriculture harvests (expressed as kg of cereal equivalent per household member) and proportion of harvest sold on the market for the 2004/2005 seasons ($N = 330$)

Parameter	<i>N</i>	Total average harvests kg/household member	Total average kg/household consumed	Per cent of harvests consumed	Total average kg/household sold	Per cent of harvest sold on market
Lilongwe	165	217.9	152.9	70.2	65.0	29.8
Blantyre	165	239.9	164.5	68.2	76.4	31.8
Male-headed households	243	265.1	209.9	79.2	55.2	20.8
Female-headed households	87	127.8	13.4	10.5	114.4	89.5
Low-income households	120	92.3	31.7	34.3	60.6	65.7
High-income households	210	306.9	230.4	75.1	76.5	24.9
Illiterate	17	68.8	19.2	27.9	49.6	72.1
Pre-school	4	90.9	53.0	58.3	37.9	41.7
Primary school education	86	153.3	111.0	72.4	42.3	27.6
Secondary school education	92	167.2	95.5	72.4	71.7	42.9
Post secondary school education	131	346.8	262.9	57.1	83.9	24.2
All households	330	228.2	158.2	69.1	70.7	30.9

were also significantly lower crop harvests recorded ($p < 0.05$) among the respondents who only had a primary education (153 kg/capita) as compared to those with post-secondary education (167 kg/capita).

On average, female-headed households harvested only half (127 kg/capita) of what male-headed households obtained (265 kg/capita), and in general, the average plot size for male-headed households was 0.24 ha while women only had access to 0.08 ha sized plots. High-income households had an average of 0.27 ha, compared to 0.06 ha for low-income households. Furthermore, better yields were observed among those from high-income households (regardless of gender).

In our opinion, harvest differences existed principally because elite households had access to large plots of land and better agricultural technologies. This suggests that the best agricultural technologies are not available to all urban food producers and one reason to account for this is to hypothesise that poor producers and female-headed households (e.g. those typically the most economically marginalised in a urban economy) do not have the same access to technology as their more 'elite' farmers. Further research would be needed, however, to test this hypothesis in detail.

In terms of the proportion of the harvests consumed directly by the family, the study found that low-income and female-headed households consumed 34.3 per cent and 11 per cent of the total harvest, respectively. This was less than the high-income and male-headed households who consumed over 75 per cent and 79 per cent of their total harvests ($p < 0.01$), respectively. There was a direct relationship between the amount of food consumed from urban farms and education level with more food consumed by more educated people ($p < 0.01$). In terms of maize yields (kg/ha) alone, it was found that male-headed households harvested more ($p < 0.01$) maize (975 kg/ha) than female-headed households (385 kg/ha) and that high-income households consistently obtained higher maize yields (1155 kg/ha) than low-income households (297 kg/ha; $p < 0.01$). Community workshops and FGDs suggested that these results were due to access to information,

educational qualifications and resources such as good quality inputs. For example, one female farmer from a low-income household said:

Most of the agricultural practices we use are based on experience we obtained from our villages. We feel the plots are so small to approach an extension agent; in addition, there are no extension officers in town whom we can approach.

Not only did high-income households have larger harvests and consumed more of these harvests, they were more efficient in terms of harvest per hectare (Figure 1). Results suggest that low-income households might not become more efficient as plot sizes grew (Figure 1, $p < 0.05$), however, other factors were also important.

Land ownership was found to be another contributing factor to maize yield and there was more ($p < 0.05$) maize (kg/ha) on leased land (1116 kg/ha) compared to rented land (940 kg/ha), customary land (483 kg/ha) and public land (450 kg/ha). Such findings have significant policy implications in that land alone is not a limiting factor because issues of access to inputs, information, labour and proper land tenure also have a direct link to crop yield and must be addressed in developing policy support or development project plans for urban Malawi. While we are aware that the literature on land tenure and agricultural management is extremely complicated (see: Fraser, 2004) results from this study are

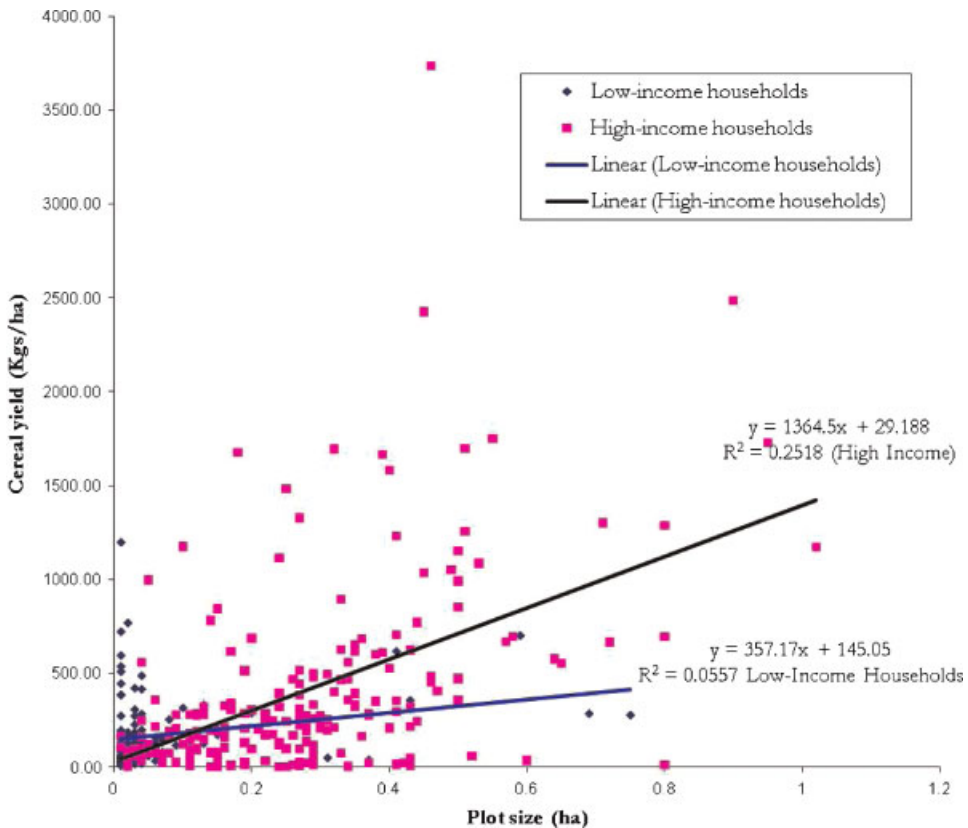


Figure 1. Average maize yield (kg/ha) on low-income ($N = 120$) and high-income ($N = 210$) urban agricultural plots in Malawi. This figure is available in colour online at www.interscience.wiley.com/journal/jid

consistent with this large body of literature that suggest farmers need to own the land before they will manage it properly.

4.2 Indirect entitlements—sales from urban farms

Table 3 shows that female-headed households obtained more income (MK 6418-rich and MK 1954-poor) than male-headed households (MK 1828-rich and MK 844-poor) from urban agriculture. Results also show that high-income households in general obtained a higher average annual *per capita* income from urban agriculture (MK 2071-male and MK 6418-female) than those generated by low-income households (MK 844-male and MK 1954-female). For example, female-headed households from low- and high-income households obtained MK 1954 *per capita* and MK 6419 *per capita*, respectively as compared to MK 844 and MK 2070 from low and high-income male-headed households, respectively. Notably, higher incomes have been generated from households involved in the livestock and poultry sectors, but these are not widely practiced by many in urban Malawi. For example in this study, only 6 per cent kept cattle, 15 per cent were raising poultry and only 2 per cent were keeping goats or sheep.

Unsurprisingly, maize was found to be the main food crop on urban farms, and was the most common crop sold to market, contributing almost 30 per cent of the total income from urban agriculture. Detailed analysis found that maize was mostly sold while green, when prices were higher. But this strategy has implications for food security since it reduces the total yield. The study found that most crops such as maize, cassava and sweet potatoes were processed either as flour, roasted or cooked before selling.

Processing improved the market price compared to unprocessed farm produce but it was observed that cooking food in unsanitary conditions caused health problems such as cholera and dysentery for the consumers (Mkwambisi, 2005). In addition, the results show that male-headed households are most likely to sell horticultural crops, followed by high-income households with female-headed households being the least likely ($p < 0.05$, χ^2).

Apart from maize, poultry and cattle, vegetables were the most lucrative sector for urban farmers. This study found that many households have resorted to growing root crops not only as a supplement to maize, but because they can perform without the use of inorganic fertilisers and have the ability to withstand drought. At first, it may seem counter intuitive that there were more low-income households keeping livestock, but this may be attributable to people living close to peri-urban areas, and hence having more land available to them than down-town counterparts. In addition, high income women were able to obtain enough space for intensive poultry production.

The study observed that there was a strong link between rural production and urban food prices. For example, during harvesting month (March–May) food prices were low in urban areas due to excess supply from rural areas. Food prices were high during period of low supply from rural areas (rainy season) when urban farmers were able to sell their stored commodities. Marketing of agricultural products from rural and peri-urban areas is not controlled and producers are not conversant with agribusiness concepts. In many cases, rural agricultural commodities were purchased by high-income businessmen who could in turn hold the product for short supply season or sold it further to other outlets such as large supermarkets. This supply chain increased food prices for low-income households. FAO observed that in reaching urban consumers, food passes through a variety of marketing and organisational systems that may generate additional costs to raise consumer prices (FAO, 2007).

It should be noted that when asking for household incomes and expenditures, many respondents were not able to provide actual numbers. This was particularly true amongst

Table 3. Average income (MK) per capita from urban agriculture within low and high-income households during 2004/2005 season (N = 330)

Parameters	Total MK												
	Arable crops (MK)					Horticulture (MK)			Livestock (MK)				
	Income	Maize	Tuber	Soya	Gnuts	Beans	Peas	Vegetables	Fruit	Cattle	Poultry	Rabbits	Shoats
Low-income (n = 120)	844 ^a	135	42	26	99	18	0.00	50	8	267	184	10	0
Female (n = 72)	1953	331	39	3	98	19	2	130	58	1010	178	52	28
High-income (n = 210)	2070	851	25	8	13	54	12	204	44	273	495	20	65
Female (n = 15)	6418	450	104	4	16	54	8	154	45	785	4387	16	407
All-households (N = 330)	1828	710	28	11	30	47	10	174	37	272	434	19	52
Male (n = 243)	2723	351	50	3	81	25	3	134	56	971	904	45	93
Female (n = 87)	2064	615	34	9	43	41	8	163	42	456	558	26	63
All households (330)	100	29	1.7	0.5	2.1	2.0	0.4	7.9	2.1	22.1	27.1	1.3	3.1
	(MK)												
	(%)												

^aUS\$1=MK140 (2008).

low-income households. It was even a challenge to quantify the amount of money realised from market participation and other sources such as remittances because some groups did not regard this as an important source of income. In addition, most of the marketing channels were informal and poorly developed. This required a detailed analysis of the marketing system to help in determining the actual monetary value and importance of urban agriculture. Therefore, it was found to be necessary to give all households a pre-designed form and discuss this at length with illiterate respondents, to enable income and expenditure data to be collected by the households on a daily basis throughout the research period.

4.3 Indirect entitlements—employment

In terms of urban agriculture's contribution to paid employment, results show that 17 per cent of all households interviewed had worked for a wage on some sort of urban agriculture enterprise in during 2004/2005 agricultural year. This makes urban agriculture the second most important source of income of all households surveyed after formal employment.

Indeed, 42.5 per cent of low-income groups and 55.2 per cent of female-headed households used urban agriculture as a source of employment (see Table 4). The evaluation of urban agriculture's contribution to employment and discussions with urban farmers suggested that many low-income and female-headed households tend to work seasonally on less regular, lower-paid, unskilled jobs within the urban agriculture sector. The discussions also revealed that many households from high-income areas tend to provide skilled labour or managerial skills in other informal and formal sectors.

Table 5 shows that between income groups, significantly more people ($p < 0.01$, χ^2) from low-income households provided unskilled labour in urban food production, while high-income households found jobs in marketing the products of urban agriculture. Female-headed households were found to be disproportionately represented in horticultural production and marketing, as well as arable crop production but are less well represented in arable crop marketing and the livestock sector. Statistically, results were significantly different between male and female-headed households ($p < 0.05$, χ^2).

Survey results show that over 70 per cent of the households who were employed by urban agriculture supplied their labour throughout the year, with only 20 per cent supplying labour during the agricultural season (December to March). Many low-income and female-headed households tend to work seasonally on less regular, lower-paid, unskilled jobs within the urban agriculture sector. Table 6 illustrates that 68 per cent of female-headed households hired help to raise horticulture crops, while only 53 per cent of male-headed households hired this sort of help ($p < 0.05$). Similarly, low-income households reported

Table 4. Proportion of households (Per cent) and main livelihoods sources in urban Malawi ($N = 330$)

Variable	(<i>n</i>)	Urban agriculture	Formal business	Informal employment	Formal employment	Other sources
Lilongwe	165	9.7	17.6	66.7	1.2	4.8
Blantyre	165	24.8	13.9	53.9	2.4	4.8
Low-income	120	42.5	25.8	5.8	3.3	2.5
High-income	210	2.9	10.0	80.0	1.0	6.2
Male-headed	243	3.7	15.2	73.3	2.5	5.3
Female-headed	87	55.2	17.2	24.1	0.0	3.4
All households	330	17.3	15.8	60.3	1.9	4.8

Table 5. Type of sector (horticulture, arable crop, livestock) where employment opportunities were available in urban Malawi 2004/2005 season ($n = 92$)^a

Parameters	<i>n</i>	Horticulture production %	Horticulture marketing %	Arable crop production %	Arable crop marketing %	Livestock production %	Livestock marketing %
Lilongwe	48	12.50	18.75	37.50	18.75	4.17	8.33
Blantyre	44	25.00	25.00	25.00	11.36	4.55	9.09
Low-income	52	23.08	17.30	44.23	3.85	7.69	3.85
High-income	40	12.50	25.00	17.50	30.00	0.00	15.00
Male-headed	61	16.39	19.67	31.15	16.39	4.92	11.48
Female-headed	31	22.58	22.58	35.48	12.90	3.23	3.23
All households	92	18.48	20.65	32.61	15.22	4.35	8.70

^aNumber of households ($n = 92$) represents only those that indicated that the head of household was directly employed by urban agriculture.

hiring more help to produce horticultural crops than higher income groups ($p < 0.01$). It should be noted that the labour market in urban Malawi is not regulated and the issue of minimum wage or recommended daily rate rarely applies in these types of contracts.

This study has found that horticulture plays a great role for both low and high-income households through cash and food. It is among the main activities undertaken by urban farmers because of its low demand on expensive fertilisers. In addition, most horticultural crops have a short duration and can be consumed even when they are not physiologically mature. However, the only implication is that large-scale production is restricted to those with access to wetlands. During rainy season the practice is very expensive as most horticultural crops require chemicals and pesticides to control diseases. This has an impact on poor households. Other groups have concentrated their hiring on arable crop production because they are either engaged in formal employment, or have other main sources of income for their livelihoods.

5 DISCUSSION

5.1 General themes

This study suggests that urban agriculture is mainly undertaken by two 'types' of farmers (Table 7). Firstly, there are the wealthy (and usually male) farmers who dominate

Table 6. Proportion of households (%) who hired labour to support their horticulture, arable crop and livestock enterprises during 2004/2005 season ($n = 141$)^a

Parameters	<i>n</i>	Horticulture production %	Horticulture marketing %	Arable crop production %	Arable crop marketing %	Livestock production %	Livestock marketing %
Lilongwe	78	46.2	17.9	26.9	5.1	2.6	1.3
Blantyre	63	68.3	17.5	9.5	1.6	3.2	0.0
Low-income	33	78.8	1.2	9.1	0.0	0.0	0.0
High-income	108	49.1	19.4	22.2	4.6	3.7	0.9
Male-headed	116	53.4	19.0	20.7	3.4	2.6	0.9
Female-headed	25	68.0	12.0	12.0	4.0	4.0	0.0
All households	141	56.0	17.9	19.1	3.5	2.8	0.7

^aOnly 141 heads of households out of 330 households managed to employ people to work on their farms.

Table 7. Summary of key results showing two different 'types' of urban farmers in Malawi^a

Characteristics	Elite farmers	Poor farmers
Gender	Usually male	Usually female
Literacy and food production	Low-levels of illiteracy with high crop production	High levels of illiteracy with low crop production
Plot size (ha)	Approximately 0.27	Approximately 0.06
Reasons for urban agriculture	Mainly as a hobby and for personal consumption	As household insurance and for income
Urban agriculture sector supplying labour	Agricultural marketing	Agricultural production
Labour supplied	Mostly permanent and skilled	Mostly temporary and unskilled
Type of labour hired	Mainly casual and unskilled in crop sector	Mainly skilled labour in livestock sector
Urban agriculture sector where labour was hired	Agricultural production	Livestock production
Season supplying labour in urban agriculture	All year round	All year round
Main constraints to urban agriculture	Lack of institutional support	Agricultural land and inputs
Main livelihoods	Mainly in formal employment	Mainly in urban agriculture and informal income generating businesses
Main average food crop yield/ha	1364 kg/ha	357 kg/ha
Harvests (expressed as kg of cereal equivalent) per capita	306 kg/year/capita	92 kg/year/capita
Income/capita from urban agriculture	MK 2381	MK 1509

^aThis represents a summary of findings from 330 households.

agricultural activities and generate a moderate proportion of their income by selling produce from relatively large plots of land that they themselves own. These farmers consume the majority of their crop themselves, and tend to employ people to help with a range of tasks including marketing of livestock and whatever produce the family does not need. These farmers are also more efficient in terms of yields. The second group of urban farmers are poorer, use much smaller plots of land that they do not own, and are often female-headed households. They undertake urban agriculture as food insurance and income generating activity.

Results, therefore, suggest that in terms of access to land, land ownership, the use of inputs and the participation in other livelihood activities, urban agriculture activities favour educated, middle and/or upper class families. These types of farmer do not only have better access to land, but they have also tend to formally own the land they use, they produce more food than poor and female-headed households, but this group uses this food mainly for their own purposes. This observation extends the results of already published work (e.g. Machethe and Reardon, 1997; Maxwell, 1999), that more powerful urban interests have realised the value of under-utilised urban land and have converted it to agriculture.

Table 8 summarises household characteristics of the urban farmers in Malawi disaggregated into gender and income status. One key result is that within each income and

Table 8. A summary of main households' characteristics and assets based on gender and income status in urban Malawi^a

Parameters (Average)	High-income		Low-income		All-households	
	Male	Female	Male	Female	Male	Female
Maize yield (kg/ha/capita)	1172	945	353	285	975	386
UA income (MK/capita)	2070	6418	844	1953	1828	2723
Wage income from other employment	No data	No data	No data	No data	No data	No data
Family size	4.38	4.13	5.08	4.21	4.52	4.20
Plot size (ha)	0.27	0.26	0.09	0.04	0.24	0.08
Main crops	Beans, fruits, maize, vegetables	Maize, vegetables	Maize	Beans, fruits, maize, vegetables	Maize	Maize
Main livestock	Poultry	Poultry	Rabbits	Poultry	Poultry	Poultry
Education level	University Secondary	Primary	Secondary	Primary	University	Primary

^aThis represents the average findings from 330 households.

education group, female farmers obtain more income than male farmers. This may be because women from all social groups do not have access to the same well-paid jobs in the formal economy as their male counterparts.

The dominance of 'elite' urban farmers, however, also echoes one of the most consistent findings from the literature on land tenure and nutritional status that households who own more land are better off than those that do not (Walker and Ryan, 1990; Maxwell and Wiebe, 1999). Land ownership for both rural and urban households can be used as a proxy for household wealth, and therefore, its relationship with favourable nutritional status proves that land enhances food security (Maxwell and Wiebe, 1999).

Another implication of high-income households dominating urban agriculture is that the farmers who produce the majority of Malawi's urban crops do not consider urban agriculture as an important tool in terms of the urban food supply systems. For example, most agricultural land in these two cities is used for maize production (Kwapata *et al.*, 2001), as this is the staple crop in Malawi. However, national level research has shown this dependence on maize precludes a more diverse and nutritious diet and is a significant contributor to malnourishment (Mkwambisi, 2005).

Urban agriculture could be used as a way of addressing this problem and become a source for fresh vegetables and other crops with valuable micro-nutrients. However, as it is currently organised, a considerable amount of agricultural land in the city is devoted to producing maize for relative well-off households. Again, this result provides an obvious opportunity for policy that could specifically support and promote the produce of vegetables. In cases where female and low-income urban farmers were observed to produce vegetables, the quality of the product was of a low grade and these products only fetched low prices as compared to products from high-income households. This included vegetables harvested before fully ripe, and those grown without proper management.

This study also revealed that poor farmers were exploited by middlemen who offer low-prices despite high quality of the produce. This was mainly reported by farmers who sold their products whilst still in the field thereby preventing them from accessing much higher prices offers by high-value chain stores. FGDs suggested that contract farming could link

urban farmers to proper markets and create more employment. A female farmer during FGDs said:

We have always been cheated by businessmen who purchase our produce at very disappointing prices especially when the owners of super markets are not ready to buy directly from us since we don't have formal contracts with such organisations.

Without government intervention, market information and extension services, urban agriculture consistently under-performs relative to its potential. Another problem was that the poor also lacked storage facilities and space for their produce, forcing them to sell during harvesting time where prices were low due to over-supply. This has larger scale implications and means that Malawi is a major food importer. The country therefore loses much needed foreign exchange, employment is not created, the quality of food is highly compromised, local producers are sidelined and urban arable land is neglected.

In addition, the urban poor are more affected as they cannot manage to purchase expensive imported crop and livestock products. They have difficulties to access cheap food in rural markets due to transportation costs. This discussion highlights a major discrepancy in Malawian policy. The current food security and nutrition policy by the Ministry of Agriculture (Government of Malawi, 2005a), advocates domestic food production including the production of root crops. These crops are drought resistant, can grow in relatively poor soil, and have relatively high nutritional value. While this policy may have helped in rural areas, ironically, in Malawi's cities it is the rich households who seem to have taken on this advice more quickly than the poor. There are two possible reasons:

- (1) The wealthy, being more educated, literate and mobile are more likely to change their practices in response to educational programmes and adopt new agricultural technologies or management practices. Following the diffusion and innovation theory covered by Everett Rogers (1995), high-income households have the required knowledge and can understand the benefits of new ideas.
- (2) Second, results here suggest that poor urban families do not engage in urban agriculture to increase their direct entitlements, but rather to manage their plots as a way of increasing incomes. Since there is little in the way of a market for tubers and root crops, the Government's strategy of promoting tuber production is really focused on direct entitlements and therefore fails to recognise the reason that the poor are engaged in crop production.

Through policies like this, the Government is failing to address the needs of the poor, and a more appropriate response could be to create more opportunities in terms of marketable products that can in turn create employment opportunities for poorer households.

It must be noted, however that, women and poor people have access to different sorts of jobs in the urban agricultural sector than their richer male counterparts. Following trends common throughout the world (e.g. Tzannatos, 1999) the salaries associated with the jobs women do are, on average, inferior to those enjoyed by men. Furthermore, women are more likely to be in part-time, temporary and casual work than men.

Women are also mainly engaged in the production side of agriculture, which has a low-wage rate compared to the marketing sector especially during the agricultural season when labour supply is high and cheap due to the shortage of food in most households. Most casual work is done on a daily basis and there is no government regulation in terms of

minimum wage or number of hours worked. By supplying labour during the agricultural season, the poorest farmers and women are also denied the opportunity to work on their own farm plots, perhaps compounding the problems of poor crop management and perpetual hunger in these poor households.

The extent to which poor families used the economic opportunities presented by urban agriculture (either by selling food or through working for other urban farms) demonstrates that urban agriculture provides an important livelihood diversification strategy. This is significant in a country with relatively few formal sector opportunities even in an economy based on formal-sector wage employment. However, urban agriculture's role is restricted because poor communities have diversified into other informal strategies such as small businesses that provide cash on daily basis.

Agricultural diversification, which has been recognised as the main livelihood strategy to attain food security, is restricted by both access to land and type of land tenure. This has prompted more poor people, especially women, to engage in temporary employment both on high-income household's farm plots as well as other domestic jobs. One reason put forward for engaging in apparently low return activities is that they provide immediate cash income. For example, a female farmer said:

It is proper to engage in small scale quarry mining that gives you immediate cash rather than farming where you have to wait for months. My children require food every day and I have to pay for rent. The little I save from the business tends to sustain my urban life.

5.2 The urban livestock sector

One distinct result stands out in opposition to the general observation that there are rich male farmers who consume their food and poorer female farmers who sale the products of their urban agricultural plots. Despite previous findings that suggest physical assets are limited in female-headed households and the poor, this study has revealed that a small proportion of women (3 per cent of the sample size) obtained relatively high incomes through livestock production.

One reason for this is the Small-Scale Livestock Promotion Programme (SSLPP) and Land (O) Lakes funded by Heifer International and USAID, respectively. Both these external programmes provide goats and dairy animals respectively to poor women and support these producers with extension services. At present, these initiatives reach only a tiny proportion of urban farmers, and the majority of women have no access to this sort of support and are still hiring help to manage and market their livestock programmes. Nevertheless, this case shows two things. First, given the necessary support, women in general, and particularly those involved with livestock production, can use urban agriculture as a strategy to generate decent amounts of income. However, it is important that income-generating strategies are not tied to owning land. In this way livestock production (especially poultry and small ruminants), which does not require much land, is ideal.

Second, that since this group finds it necessary to hire marketing help, there is a clear policy opportunity. The Government or international programmes could target this sector and engage in marketing training specifically for women involved in urban livestock production.

In accordance with these discussions, projects that provide the right support can contribute to poverty reduction and help meet household and national food targets. It is evident that poor and female-headed households require practical programmes that will yield results in the short term while providing long-term support. Evidence presented here suggests that livestock production is a realistic way of achieving this. In Malawi, raising small stock like goats and sheep is not taken seriously as a way of reducing poverty and improving nutritional assets. Yet they breed quickly, provide milk, and do not require much space. Furthermore, in Malawi, and across much of Africa, producing livestock in the city is generally forbidden by municipal by-laws. For example, Schiere *et al.* (2006) found that in many countries livestock husbandry in cities is an activity that does not have official status and is often banned.

As a result, the potential for livestock production to improve livelihoods is under-realised. An appropriate policy response might be to allow livestock production in urban areas increase incomes of urban poor communities while creating employment. The fact that urban livestock continues to be found in and around African cities implies advantages for local stakeholders. Of course, this industry would have to be carefully regulated and inspected especially due to the health and safety implications of raising animals in close proximity with human settlements.

Since the poor are already producing livestock, these inspections and regulations are already necessary. The challenge is to come up with alternatives to current land use and policy that can encourage more intensive, and more diversified, urban agriculture including support for the livestock sector or crop varieties that will mature in very short periods and give higher yields.

6 CONCLUSIONS AND POLICY RECOMMENDATIONS

The results from this study reveal that Malawi, a typical example of Southern Africa, is neglecting the role of urban agriculture as a poverty reduction strategy. At the current level of practice, urban agriculture is an underutilised strategy for reducing poverty. Given the rapid rates of urbanization across Malawi and other Sub-Saharan African countries, there is a need for regulated urban agriculture that can help reduce current socio-economic problems faced by the poor.

On direct entitlements, UA is being under-utilised because of land tenure and property rights policies that do not recognise the sector. More land is available to high-income households that practice UA mainly for home consumption. UA is dominated by male-headed households mostly because they are educated and have access to resources. This has neglected the role of low-income households who have enough labour to promote urban food production.

To realise the benefits of urban agriculture, it needs to rise on the political agenda. There are systemic reasons why this is a difficult goal and this study has found a lack of policies dealing explicitly with urban food security and nutrition problems. Because of this weakness, there are no proper mechanisms to handle issues such as land tenure, distribution of farm inputs, urban food market structures and capacity building. Those undertaking urban agriculture are not recognised as potential stakeholders to reduce food insecurity and poverty problems faced by most cities in Sub-Saharan Africa. Programmes that can support utilisation of municipal solid waste and waste water for food and livestock production could be intensified for urban sustainability. In this case, policy could focus on pro-poor

poverty reduction measures that target marginal producers who use urban agriculture as a poverty reduction strategy.

Market-based entitlements show that current food market structures have neglected urban producers and depend on rural agriculture and international markets. Despite that this has resulted in the availability of different types of foods (energy, protection and vitamin sources), the prices have not been favourable enough to low-income households. In this case, crop and animal diversification could be a proper approach to meet the dietary requirements of urban people thereby reducing food process and meeting health targets. High-incomes from urban agriculture are mainly from surpluses rather than from commercially oriented farming. This has affected employment rate, availability of different food products and the entire food distribution chain in urban Malawi. Livestock producers (mostly women) are not given the opportunity to add value despite current high incomes. There is need to empower these groups so that they can process their products for better and improved market returns. For example, even high-income farmers who have access to land, information and markets have not been given the opportunity to engage in dialogue with the government on the type of crops and livestock they can promote. The issue of land tenure system could be considered seriously especially that land management institutions do not consider urban agriculture in their land zoning and distribution.

Urban agriculture's lack of official recognition has created a situation where unregulated street vendors are the primary source of seed and fertilizer and they are also the main buyers of farm produce. This result into poor crop output, less produce from farm plots, health and sanitation problems for farmers, livestock and crops, overall, lower produce market prices. This is a challenge for most African countries as vendors dominate this informal sector from input supply to marketing. In this case, policy could focus on developing a better agricultural extension framework.

Policy should not necessarily emphasise increasing yields, but should start with capacity building exercises amongst poorer urban farmers, specifically those led by women, and help them better manage, distribute and market their agricultural produce. In terms of labour-based entitlements, results presented here suggest that it is the wealthy farmers who can create more jobs in the urban agriculture sector to poor households who currently supply casual labour and receive very low incomes. As such, it may be appropriate for this informal sector to be regulated by authorities. For example, by providing resource utilisation and extension training programmes, low-income urban farmers could create employment and meet their income requirements. The labour market could be regulated and authorities could facilitate ideal employment conditions for those working in the urban agriculture sector. Another observation is that when many households have no food during the main agricultural season they tend to seek paid employment. This imbalance can only be corrected if urban food supplies can be increased during rainy season through new technologies such as post-harvest storage and promotion of winter (irrigated) crop for food availability and distribution. Therefore, a key policy goal could be to formulate an effective urban agricultural labour market by promoting both short-term horticultural crops and annual arable crops that can be utilised throughout the year.

Finally, it is clear, especially in Sub-Saharan African countries, that urban regions have the sort of diverse environmental and geographical conditions that could be able to sustain a range of different crops through out the year. This could provide a benefit to the urban poor in terms of nutrition and employment. However, if policy extends the amount of land available to urban agriculture, it is important that this be done carefully and with an understanding of local environmental conditions. As such, these results could not be

interpreted as a call to simply increase the urban land under cultivation, but rather that a careful assessment is made of appropriate land for cultivation that should then be made available to those who can promote food security, employment opportunity and environmental conservation while targeting poor communities.

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