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**Urban agriculture under threat:
The land security question in Kano, Nigeria**

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Urban agriculture under threat: The land security question in Kano, Nigeria

Abstract

This paper is concerned with the issue of providing food to the rapidly growing urban populations in poor countries of Sub-Saharan Africa. Much emphasis has been given in recent years to the growing of basic foodstuffs in urban and peri-urban areas. Whilst there is a considerable body of literature which views urban agriculture in a relatively positive light, other less extensive literature raises concern about its impact on environment and people. The literature shows that urban agriculture provides farmers with important employment and food provisioning opportunities that would not otherwise be available. However, empirical evidence presented here from the city of Kano in northern Nigeria suggests that such activities and livelihoods are being threatened by acute problems of tenure insecurity and encroaching land development. It is suggested that local authorities have a key role to play in enabling and supporting urban cultivation, since there are city-wide benefits to be gained from such activities, including food supply and employment creation among low income residents, and flood control. More research is needed to clarify certain issues, not least to answer the expressed concerns about the impact of urban agriculture on environment and health.

(190 words)

Keywords: Urban agriculture, Kano, Nigeria, land tenure, security

Introduction

At the start of the 21st Century, the world faces the greatest population explosion ever with 200 children being born every minute. Developing countries have the most rapid population growth, and those in Sub-Saharan Africa the most rapid of all, with a 2.6% annual growth rate between 1995 and 2000 (World Resources Institute, 1999). Some writers have linked

this population growth to environmental degradation (Meadows et al, 1992), whilst others contest the direct link between environmental degradation and population growth (Mortimore, 1998; Tiffen et al, 1994). One particular concern relating to population growth that is beyond dispute is the very rapid rate of urbanisation, with Sub-Saharan Africa experiencing urban growth of over 5% per annum between 1975 and 1995 (See Table 1).

Table 1. Urban population growth in selected countries

Country	Urban Population ('000)			Percent urban			Annual Growth rate (1990-95)	
	1975	1995	2025	1975	1995	2025	Urban	Rural
Nigeria	14,676	43,884	146,948	23	39	62	5.2	1.7
Ethiopia	3,061	7,371	37,929	10	13	30	4.7	2.7
Ghana	2,955	6,333	21,934	30	36	58	4.3	2.3
Tanzania	1,602	7,230	30,344	10	24	48	6.1	2.0
Zimbabwe	1,202	3,619	10,874	20	32	55	5.0	1.5
India	132,272	250,681	629,757	21	27	45	2.9	1.6
Bangladesh	7,108	22,034	78,430	9	18	40	5.3	1.5
Malaysia	4,616	10,814	22,942	38	54	73	3.9	0.8
Bolivia	1,975	4,505	10,370	42	61	79	2.7	-1.4

Source: World Resources Institute, 1996, World Resources 1996-97: The Urban Environment

This rapid rate of urban growth has prompted increased focus on how to deal with the problems of what the Brundtland Commission called the 'urban challenge' (World Commission on Environment and Development, 1987). Researchers and organisations monitoring this situation have provided a number of useful perspectives:-

- 'More than half of humankind will live in urban areas by the end of the 20th century, and 60 percent by 2020... In coming decades, most of the world's poor will be urban, living under conditions that can be worse than those of the rural poor' (World Resources Institute 1996; p.ix). 'It is almost a truism that the planet's future is an urban one and that the largest and fastest growing cities are primarily in developing countries' (Rakodi, 1997; p.1).
- There is growing concern about providing for rapidly growing cities in Sub-Saharan Africa, where urban population growth rates are fastest. 'Cities in Africa are growing faster than in any other region. Most of the increase is the result of migration, reflecting people's hopes of escaping rural privation more than actual opportunity in the cities.' (United Nations Population Fund, 1996)
- This growing population is already outstripping urban services and infrastructure

provision (see for example Gilbert (1992) on housing, Drakakis-Smith (1996) on employment, and Anton (1993) on water). There is concern about urban exploitation of key natural resources, expressed as ‘the city’s growing ecological footprint’ (Main, 1995).

- Some of this concern has focused on the provision of food. There has been a significant growth in the importance of urban farming as a source of food and as a focus of research (Binns and Lynch, 1998; Smit & Nasr, 1992; United Nations Development Programme, 1996)

And yet, while these alarming data are presented, some empirical research is suggesting that the distinction between urban and rural is breaking down and that these ‘places’, previously seen as discrete, are beginning to intertwine (Potter & Unwin, 1989; Tacoli, 1998). For example, Mougeot (1994) argues that the definition of ‘city’ as non-agricultural is a Victorian invention. He cites archaeological and historical records that clearly show that agriculture was an integral part of the urban scene until the late 19th century. During the Victorian period, laws were introduced in many European cities to exclude agricultural activities, mainly on the grounds of concern about public health. This approach to city management was subsequently transferred to the administration and planning of colonial cities.

There has been a tendency in the past to over-simplify the nature of urban agriculture in Third World cities. For example, Drakakis-Smith (1994) makes a twofold distinction between home gardens and cultivation of the urban periphery. Binns & Lynch (1998), however, concluded from their comparative study of Kano (Nigeria) and Dar es Salaam (Tanzania) that there is considerable diversity in the character of urban agriculture even at a local level. Ellis & Sumberg (1998) argue, that it is dangerous to assume that because urban agriculture looks similar in different cities, or in different parts of the same city, that the motivations are the same or that the constraints are the same. The diversity may be a function of a wide variety of factors which might include the location and distribution of urban and peri-urban agriculture, the motivation of producers, difficulties experienced by producers or problems resulting from urban agriculture.

Binns & Lynch (1998) expressed concern that some published work on urban agriculture suggested that it was the panacea for solving urban food supply problems, without giving full consideration to the wider implications of a future increase of urban agriculture. Von Braun

et al (1993) argue that urban agriculture is just one response of many that can improve urban nutritional circumstances.

Urban Agriculture and the Issue of Land Tenure

A number of significant publications in the last decade indicate the growing importance given to the issue of urban cultivation by international development organisations and researchers. For example, the Canadian International Development Research Centre has sponsored a series of detailed investigations (IDRC, 1998), many of which are very positive about the role which urban agriculture might play in solving the problems of employment and food security in African cities. The United Nations Development Programme (UNDP) published a comprehensive report for consideration at the Habitat II conference (Istanbul, June 1996), based upon evidence gathered on urban agricultural activities across the world and compiled by the Urban Agriculture Network (1996). This was primarily a statement on the current situation, providing a largely descriptive account of the nature of urban agriculture, together with identification of key opportunities and constraints. These international initiatives have been instrumental in focusing the attention of researchers on urban food security issues.

A number of studies on urban agriculture have been cautious about its promotion without a better understanding of its implications and medium- and long-term sustainability in the light of rapidly changing urban environments (Aldington, 1997, Drakakis-Smith 1994; Smith, 1998; Ellis & Sumberg, 1998). It seems particularly important that at a time when attention is being focused on urban problems in developing countries (World Commission on Environment and Development, 1987; World Resources Institute, 1996; United Nations Population Fund, 1997), more analytical work should be undertaken to ensure that the promotion of urban agriculture does not actually cause more harm than good. For example, Rakodi, writing about urban agriculture in Zambia, cautions that little research has been done on the changing relations between urban and rural areas, particularly under structural adjustment policies (Rakodi, 1988). Also Lynch (1995), writing on urban food supply in Dar es Salaam, concludes that more research is required to arrive at the conclusion that urban agriculture is more sustainable than rural production. There are occasions when rural production may be more beneficial than urban production, particularly where there is greater availability of suitable land, water and labour and less chance of conflicts of interest than in large and crowded cities.

The literature on urban agriculture has been characterised by Ellis & Sumberg (1998) as falling into two broad approaches. These are, firstly, a body of work that promotes urban agriculture as a solution to the growing concerns about urban food security. The main reasons commonly given for promoting urban cultivation include;

- the provision of vital or useful food supplements (Rakodi, 1988)
- various environmental benefits (Margiotta, 1997)
- employment creation for the jobless (Sawio, 1994)
- providing a survival strategy for low income urban residents (Lee-Smith & Memon, 1994)
- making use in urban agriculture of urban wastes (Egziaber, 1994)

A second group of work is described by Ellis & Sumberg (1998) as being concerned with empirical research on urban agriculture. Some of these latter studies have suggested that there may be problems in promoting cultivation in urban areas. Reasons for this include;

- water shortages, particularly in arid or semi-arid urban environments (Mvena et al, 1991)
- health concerns, particularly from the use of contaminated wastes (Mvena et al, 1991)
- conflicting urban land issues (Mvena et al, 1991)
- a focus on urban cultivation activities rather than its position in relation to broader urban management issues (Rakodi, 1988)
- the inability of urban agriculture to contribute substantially to urban food needs (Aldington, 1997)
- a lack of clarity over whether it is best to produce in city or country (Lynch, 1995)

Ellis & Sumberg (1998) point out that a classical locational analysis of farming suggests that high value and perishable crops are likely to be produced close to the urban market.

However, in reality this is not necessarily the case and an understanding of local circumstances may provide information about the functioning of land markets and transactions supporting urban cultivation. The particular circumstances that might make urban agriculture viable frequently involve a complex set of arrangements, such as the changing needs of households, their ability to satisfy those needs through employment

opportunities and the breakdown of land regulation and market factors. Such variables can result in opportunities for urban cultivation that are temporary, risky and non-replicable. It is therefore important that before committing shrinking development budgets to the promotion of urban agriculture, more research should be undertaken to seek a clearer in-depth understanding of particular situations. For example, there is conflicting evidence that households which engage in urban agriculture as a survival strategy are not always recent migrants to the city, nor are they necessarily the most resource-poor urban dwellers (see for example Briggs, 1991, Sawio, 1994).

The motivation for this paper comes from earlier research on the extent and significance of urban agriculture in Kano, northern Nigeria (Binns and Fereday, 1996; Binns & Lynch, 1998; Olofin et al, 1997), which concluded that urban agriculture makes key contributions to city nutrition, employment and environment. This research identified the issue of security of tenure as a key factor affecting producers in a scenario of rapid urban development. The paper examines the key, and somewhat neglected, issue of urban farmers' experiences of access to and tenure of the land on which they farm. In-depth interviews with farmers on a single site in the city of Kano, Nigeria, have been conducted over a period of four years, in order to elucidate the key factors relating to the tenure situation. The study has been undertaken at a time when developers have been gradually encroaching on the land farmed. The specific site and the respondents interviewed were selected as they provide a wide spectrum of backgrounds, ranging from a farmer-owner who runs a seed and flower production business, to a number of farmers who have already had to move their plots as a result of encroachment by developers. Questions of the legality of urban agriculture and security of tenure, are vital considerations if such production is to be encouraged and fully incorporated into sustainable planning strategies for urban food security. The study is based upon data collected in three field surveys undertaken in 1996, 1998 and 2000, which provide a valuable longitudinal record of change in both the extent and character of urban agriculture.

A clear finding from published evidence suggests that urban agriculture often tends to develop in areas that have a precarious tenure status, and it is not uncommon for many farmers to cultivate land in and around African cities over which they have no formal rights. A comparative study of urban agriculture in Addis Ababa (Ethiopia), Enugu (Nigeria) and Kano (Nigeria) concluded that in all three cities, 'a key factor and constraint for urban and

peri-urban farmers is secure access to land' (Orchard et al, 1997, p17).

In some situations the peri-urban area represents an interface between commercial land markets and customary systems of tenure mediated by communities and elders (Kufogbe, 1996). Under structural adjustment programmes some government agencies and local government bodies have actually allocated land for sale or urban development (Briggs & Mwamfupe, 2000). These circumstances may combine with complex and often poorly resourced legal and land registration procedures which have to be negotiated before someone gains formal ownership of a piece of land. In reality, in many African cities there is considerable ambiguity about legal rights and a lack of clarity of the tenure system. While such circumstances can provide opportunities for some farmers to obtain land, albeit invariably on a short-term basis and with limited tenure, such arrangements can further compound a farmer's difficulties, since most credit providers seek evidence of legal ownership as a form of collateral against any loan. In the light of these difficulties some public agencies have adopted what Orchard et al (1997) describe as 'accommodative' approaches, by making unused land available to urban farmers, at least for a restricted period. However, as Orchard et al (1997) also point out, this is by no means the universal attitude and indeed authorities can adopt 'prohibitive' and 'non-interventionist' approaches to land markets in which the cultivation of crops might be respectively disallowed or condoned, but not supported.

Some urban farmers may cultivate publicly owned land for which they have negotiated use rights. This means that the institutions owning the land may rent it out to urban cultivators while they themselves cannot use it. The advantage for the institutions is that the land (which they may be holding for future development, but may not at the time have the resources to develop), is occupied and therefore less prone to squatting by more permanent uses, such as speculative builders. Maxwell (1994) reports instances of this practice in Kampala, Uganda, where there was evidence of a 'use rights' land market, maintaining occupation and protecting the owners' rights to the land. He suggests that different categories of urban land tenure are associated with different motivations for farming. For example, the owner-occupiers in Kampala were generally commercial farmers, while farmers producing for self-sufficiency tended to be well connected to land owners, trading on their social capital, rather than economic capital. Significantly, Maxwell goes on to argue that it is precisely this range

of tenure types, and the ambiguity of aspects surrounding land markets, that creates the interstitial spaces that urban farmers can use. Urban management involves regularisation of urban land markets, which is a costly process. However, these high costs do not include the costs to the urban farmers who have no formal tenure and lose their access to land.

Interestingly, Maxwell argues the case for a two-stage movement towards the regularisation of urban space, which includes compensation and the creation of new urban agriculture spaces, so that cities can still gain from the benefits of urban agriculture through such aspects as employment, food and nutritional security (Maxwell, 1994).

The case of Kano, Nigeria

Kano, with an estimated population of between 2 and 3 million, is the largest city in northern Nigeria, a country which has more cities with over a million people than any other in Africa. Located in the semi-arid savanna belt, with an annual average rainfall between 1961 and 1991 of under 700mm, and a long dry season from late September to May, the Kano region experiences considerable variation in both the amount and frequency of rainfall from one year to the next. Dry season cultivation can only occur where irrigation is present, and low-lying areas in river valleys and depressions, where the water table is close to the surface (known locally as *fadamas*), are valuable locations for such cultivation. The construction in the last 20 years of a number of dams and associated irrigation schemes in Kano State, together with the sinking of wells and boreholes, has resulted generally in more water being available for dry season cultivation. However, in urban and peri-urban areas of Greater Kano, where sewage systems are inadequate and poorly maintained, and where abattoirs, tanneries and various industrial activities discharge their effluence into rivers and drains, pollution of water sources can be a serious problem, particularly during the dry season when rainfall which might dilute and flush out toxic elements is absent (Lewcock, 1995).

A survey undertaken during May and June 1996 discovered considerable amounts of fruit and vegetables being produced in and around Kano, within 10 km of the walls of the old city (Fig 1), and mainly located near major routes (Olofin et al, 1997). Whilst a few of the sites were entirely devoted to fruit production, the majority were mainly under vegetables, though with occasional fruit trees. Plot size ranged from 0.01-0.4 ha in the built-up area to 0.1-2.0 ha in the peri-urban areas. A total of 103 farmers were interviewed on the vegetable production sites and 9 interviewed on the orchard sites. The study revealed that the issue of insecure land

tenure was a major problem for many cultivators across the city. In fact, in the case of only two of the vegetable production sites was tenure secured - 'For most sites, tenancy is a combination of permitted and non-permitted squatting' (Olofin et al, 1997, p11). In such sites, cultivation by the urban poor is being threatened by the sale of the undeveloped lands to urban land developers by government agencies.

Insert Fig 1 here

In January 1998 and February 2000, the authors re-visited on several occasions one of the original sites which was enumerated in the 1996 study and where insecurity of tenure posed a major threat to the livelihoods of vegetable growers. Detailed interviews were conducted with producers, many of whom had participated in the original 1996 survey. The farmers interviewed were a diverse group, including full-time farmers, part-timers who were employed but worked on their plots when they could, and also a specialist flower and seed grower.

The legislative context of land ownership in Northern Nigeria is somewhat complex as a result of the co-existence of indigenous Hausa systems of land tenure alongside elements of external legal systems, originating from Islam and the British colonial period. To add to the complexity, this is mediated by more modern cultural appraisals of the meaning of land and the ways in which land should be administered. Under the indigenous system, land is held within an extended family unit (*gandu*), with rights extending over areas of cleared bush where there is no evidence of a previous owner. The customary system is based on the needs of the individual, within the bounds of the land available to the family and the community. However, superimposed over this system is a legal system based on English Common Law brought into force on 1st January 1900 (Adedipe et al, 1997). This system operates where customary law is not applicable, and where the land has been sold into the market system. In an attempt to clarify some inconsistencies in the Common Law system, the 1978 Land Use Decree gave the federal government control of all urban land, with powers allocated to the State Governor to grant customary rights of occupancy.

The Kofar Ruwa production site

The Kofar Ruwa vegetable production site (see Fig.1) is a low-lying area of 350 x 250 metres in the north-western part of the walled old city of Kano and located in the floodplain of a small tributary stream to the Kwarin Yauran, which is itself a tributary of the Jakara river. These water courses, as elsewhere in Kano with its grossly inadequate sewage system, serve as drains for urban waste water and as a result are heavily polluted. Figure 2 shows both a sketch map and a cross-section of the Kofar Ruwa site and it can be seen that the Kwarin Yauran stream runs immediately to the north of the city wall which forms the northern boundary of the site..

Insert Fig. 2 here

The site spreads across the two districts of Kofar Ruwa and Gwammaja in the Dala Local Government Area and is bounded in the west by the main road, to the north and east by the city wall, whilst to the south is the rapidly growing housing area of Gwammaja. Four stabilisation ponds are all that remains of an abandoned sewage treatment scheme which was started in the late 1960s. The scheme was planned to treat waste water from Gwammaja housing estate, the Dala Orthopaedic Hospital and other parts of the city, and to produce clean water for domestic use.

The site was initially under the jurisdiction of the Federal Department of Forestry and the head office of the Shelterbelt Programme of the Department of Forestry is just across the city wall to the north of the site. Under that management, the site was once covered by dense bush that local residents complained was a favourite hiding place of criminals. With growing concern about this, the Forestry Department invited interested persons to clear and cultivate plots at the site. It seems that this invitation occurred in two phases; the first coinciding with the military regime of General Obasanjo (1976 - 1979), probably at the height of his 'Operation Feed the Nation' programme (1977/78). The second phase coincided with the directives given by the Federal Government under the regime of General Mohammed Buhari in 1984, that all the Federal Government's vacant land in cities should be cultivated, until these areas could be developed.

Poorly paid junior civil servants and landless peasant farmers responded enthusiastically to

the call from the Department of Forestry. Some of the farmers interviewed belonged to the first wave of farmers that came to the site. The first invitation was followed in 1981/82 by the civilian Governor of Kano State, Alhaji Abubakar Rimi, invoking the provisions of the 1978 Land Use Decree, in which he took over the ownership of the site and allocated plots in the Kofar Ruwa Local Government Areas (LGA) to urban land developers. Similarly, the second invitation was followed in 1990/91 by another civilian Governor, Alhaji Kabiru Gaya, allocating plots on the Gwammaja LGA side to urban developers.

At the time of the study every square metre of the site had been allocated to urban developers, whilst those engaged in agriculture continued to farm the land, in some cases inside the walls of uncompleted houses. There appeared to be an increasing sense of urgency in the situation among farmers on the site since the original survey was carried out in 1996. For example, four new buildings appeared in the 1998 survey which had not been present in 1996. In February 2000 several new houses had been constructed on the south side of the site and a large block of houses was being erected parallel to the main road on the west side of the site (between the transect line and the built-up area just south of the city wall in Figure 2). Indeed, since the allocation of these plots to urban developers, the level of competition between different land uses has increased considerably and the livelihood of the farmers has undoubtedly been threatened. As one farmer commented to the survey team:

You are big people to whom government will listen. Please tell the government not to take this land from us. We have no other place to go. A lot of people depend on us, and thus on this land.

(Source: Authors' Survey 1998)

Farming at Kofar Ruwa

There are two components of cultivation on the Kofar Ruwa site. First, there is the irrigation of all parts of the site during the dry and transition seasons to grow crops such as lettuce, cabbage, amaranthus, maize, onions and okra. Secondly, there is the cultivation of swamp (paddy) rice in the less well-drained central part of the site. The cultivation of vegetables also occurs in well-drained areas during the wet season. During the transition season the main crops grown are maize, okra and sweet potatoes, whilst a few stands of sugar cane, cassava and banana remain throughout the year (Olofin et al, 1997).

The farmers interviewed were all small operators and all men, assisted by their children. For most farmers cultivation of their small plots was their main occupation. The farmer with the largest piece of land had about 1.2 hectares (approximately 3 acres), but some cultivate plots that are much smaller than a hectare. It was confirmed during the study that only two of the 45 farmers enumerated in the 1996 survey actually owned the plots they cultivated. Thus, the great majority of those farming at Kofar Ruwa were squatting on land owned by urban developers. Whilst some of the squatters knew the owners of the land which they were cultivating, or the agents of the owners, many were unaware of the actual owner. The majority of farmers at Kofar Ruwa were low-income urban residents, who reported that their livelihoods are threatened by their insecurity.

The length of time they have cultivated at this site corresponds with evidence presented by Rogerson (1997), that most urban cultivators are long-term urban dwellers. In fact, many farmers on the Kofar Ruwa site have cultivated for 15 years or more. The site has examples of both low-income urban dwellers who are engaged in strategies to reduce their economic and food vulnerability, and a few, generally more wealthy producers who are primarily engaged in supplying the city markets. Rogerson characterises these different informal activities as, respectively, 'survivalist' enterprises and 'growth' enterprises.

Farmers have demarcated their plots with henna bushes, cowpeas and/or millet stalk fencing along the boundaries. The developers have had the land surveyed and concrete markers cover the site indicating formal ownership of plots for development. The developers' plots do not necessarily correspond with the farm boundaries and some farmers are working land that is actually owned by more than one landowner, making relations between farmers, developers and their agents more complex. On the other hand, this situation could actually benefit the farmers, at least in the short term, by making it less likely that they would lose all their land at one time. To give some idea of the complexity of tenure arrangements, one respondent had two plots of land which had three developer-owners and which are located in both Local Government Areas. He sees this as giving him greater security, since what one developer does is unlikely to affect the others, and what happens in one Local Government Area will not necessarily affect the other. Not all relationships between the farmers and the developers are antagonistic. One farmer, whose land was taken over by the developer for house building, had received good warning and even compensation for his perennial crops,

which included tomato, pawpaw and cocoyam.

Sustaining livelihoods

The livelihoods of most of the farmers interviewed depend primarily on their production at the site, since a good proportion of the crops is destined for home consumption. Respondents reported that the percentages consumed at home ranged from around 30% for spinach and lettuce to 50% for rice. Many farmers indicated that money gained from produce sales is used to buy other staple grains and foodstuffs which they did not grow themselves. Such income is also used to meet various financial obligations of their families, such as school fees and medical charges. The few part-time farmers indicated that they too rely on their production to survive, since their monthly salaries could hardly sustain them for longer than fifteen days. Indeed, the chairman of the Federal Economic Recovery Commission, Professor Sam Aluko, stated in a television interview (September 1997) that the current take-home pay of an average civil servant in the country, "...could hardly take him home." Among the farmers interviewed, one was a retired worker from the Forestry Department and one was a driver with the Nigerian Airports Authority. One farmer reported that as he was caught between, on the one hand, having to continue working in his formal employment and, on the other, pursuing his farming activities, he did not earn enough to invest in labour, better seeds and other inputs. He therefore has to work on his farm himself and the limited time, labour and capital available mean that he is unable to engage in the intensive production of profitable crops, such as tomatoes and lettuce. One farmer had started farming a plot in 1995 after he was made redundant from a bakery and farming was now his sole income. These cases emphasise the significance of urban farming activities to the livelihoods of urban cultivators and their families from a range of socio-economic backgrounds.

The latest survey of the Kofar Ruwa site, conducted in February 2000 revealed some interesting developments. First, property developers are now beginning to build on land at the edge of the site. A group of new houses was nearing completion on the north-western side of the site (bounded by the city wall to the north and the built-up area to the west and the transect to the east – see Figure 2) which were being built by a well-known Kano businessman. Although the central part of the site does have a very high water table, even during the dry season, there was a widespread feeling among farmers that wealthy developers

could easily improve the drainage system such that there would be no problem about further building. One or two farmers actually mentioned that the Local Government was about to construct a culvert at the western edge of the site to go under the road running north to the Kofar Ruwa (see Figure 2). There was some speculation that the developer (mentioned above) was sufficiently influential in the city to be able to encourage the LGA to act on the problem of flooding. The involvement of such a well-known and wealthy businessman suggests that the days of farming on the site may be numbered.

A second interesting finding from the most recent survey in February 2000, was that a number of farmers commented that the profitability of their activities had actually increased in the preceding year. Some respondents reported a general upturn in the economy, such that food prices had stabilised and, in some cases, even reduced since July 1999. For example, a 60 kg bag of gari (cassava flour) in April 1999 cost N1,200 in the city markets, whereas the same-sized bag in January 2000 had reduced to N650. Similarly, a 50 kg bag of long grain imported rice cost between N2,300 and N2,500 in January 2000, whereas in April 1999 it had been as high as N3,200 (February 2000: N105 = US\$1; N160 = £1). The economic upturn seems to be associated with the demise of the military regime and the coming to power on May 29th 1999 of the democratically elected regime led by President Olusegun Obasanjo.

Constraints on farming at Kofar Ruwa

The major constraint faced by farmers at the Kofar Ruwa site was undoubtedly that of insecurity of tenure and an uncertain future in relation to the plans of urban developers. It seems likely that those farmers who are totally dependent on crop production for household income and subsistence will suffer much more than those who are engaged in farming as a part-time activity. One farmer commented:

I was paying a fee to the Forestry Department for 7 years for access to the land and then they sold it off. I don't sleep well some nights worrying about when I will be thrown off my farming land. The owners of the land occasionally come and say I am misusing the plot and I should leave.

(Source: Authors' Survey 1998)

Almost all the farmers interviewed expressed concerns about what was going to happen to the site. Many reported that agents of the developers, had visited periodically to put pressure on

the farmers to pay money to the owners. Some reported that their crops had been damaged by agents if negotiations had broken down. Another farmer remarked:

The whole area of my plot was sold to developers 15 years ago. The plot has been marked out. I am very worried that the owners will throw me off the land. On one of my plots I lost all of the crops I had planted when they were cleared by the developers. They had been close to harvest.

(Source: Authors' Survey 1998)

Such destruction of crops represents a significant risk for the producers. None of the respondents reported having seen proof that the agents were representing the owners of the land and simply had to take the word of the agents. The impact of this insecurity is far from uniform. Those cultivating nearest the drainage channel, for example, had received less pressure from land agents, as the developers are less likely to build on this area because of the danger of flooding during the rainy season. In fact, one farmer interviewed in February 2000 at a location where the water table was only 20cm below the surface, commented:

My security is water. Even the buildings on the very edge of the site have to have very good foundations to secure them because of the marshy ground.

(Source: Authors' Survey 2000)

However, where producers were located further away from the drainage channel and closer to the existing buildings, and where they were cultivating more commercially advantageous crops, the farmers seem to be more likely to have pressure exerted on them by agents. The additional layer of authority introduced by the agent has complicated the situation and further increased the insecurity of the farmers. This is illustrated by the case of one farmer, who explained that he was lucky in meeting the owner of his land at an early stage and they were able to establish a mutually beneficial relationship. The farmer said that by cultivating on the developer's plot he makes it difficult for people to place false markers and forge deeds to sell land over which they have no title. In return, the farmer has been assured security of tenure in the short- to medium-term. In this particular case the farmer does not pay the owner, but the relationship is kept on good terms, with the farmer occasionally delivering some of the produce from his plots to the owner and the owner's agent visits the farm on a regular basis. Farmers are clearly trying to strengthen their links with the plot owners in the hope of

reducing their vulnerability, which corresponds with Maxwell's (1994) findings in Kampala, discussed earlier. Some farmers also argued that in cultivating the plots they are providing a measure of security to the landowner whilst they are not developing the land, by keeping the land clear, maintaining the owner's claim of ownership and ensuring that the owner has access to the land when required.

Although insecurity of tenure was identified as the key problem, respondents suggested that other factors also affected their cultivation activities. Three factors were mentioned. First, the damage to crops by animals and birds, which is particularly problematic when rice is grown during the wet season. Secondly, theft of crops, particularly maize, by children and others was identified as another problem. Thirdly, the shortage of water in the vicinity of the site during the dry season was a serious constraint on production on the edge of the cropped area (see Figure 2). Most of the water available is waste water, with the amount depending on levels of consumption by households in the surrounding urban areas and location in relation to the stream. It appears that the choice of crops grown in particular plots is often determined by the ease of getting adequate water to such plots.

Conclusion and Recommendations

The field research on urban agriculture undertaken in Kano over a five-year period has provided important data on the scale, problems and potential facing urban agriculture. In particular, the investigation has revealed that:-

- insecure tenure causes considerable stress for existing urban farmers
- urban cultivation can benefit existing land owners by protecting their claims to the land and in some cases providing a small income
- urban cultivation can provide more general urban improvements, such as enhancing the security of local residents, since the cultivators are now utilising what was previously an area of unproductive bush harbouring criminals
- urban agriculture can also provide flood protection, since concerns have been expressed about the effects of 'concretizing' the area studied, which appears to act as a 'flood buffer' in protecting neighbouring built-up areas from the effects of seasonal flooding.

However, as we have seen, during the period of study (1996-2000) farmers on the Kofar Ruwa site, as indeed on other production sites in Kano, have reported increasing levels of

anxiety as the site is gradually developed, threatening their future access to the land. This has adversely affected their quality of life and has impacted on their agricultural activities.

It is essential that urban agriculture should be appreciated holistically, in terms of how it fits in with urban structure, urban problems and the livelihoods of individuals and communities. For example, in cities such as Kano, which are susceptible to flooding, there may be an argument for setting aside land for agricultural purposes, which could ameliorate the flood hazard. This is an undoubtedly controversial proposal, but it nevertheless illustrates the importance of such issues being tackled in an integrated and holistic framework.

In conclusion, a number of observations can be made as a result of the longitudinal study undertaken in Kano. The Kofar Ruwa site, which is just one among many areas of food production in the city, provides a clear benefit in a number of ways to the city and its inhabitants. However, as open areas of land are progressively developed, many low-income farmers will lose their main or secondary employment, whilst higher income groups benefit from housing and business investment. It is suggested that such urban agriculture sites in Kano and other cities in sub-Saharan Africa, provide valuable resources for addressing the challenges of the rapidly growing city, in particular providing a public benefit for low income groups. Local government should facilitate the use of such sites by low income urban dwellers to provide employment and make a valuable contribution to food security. In an ideal scenario it may be preferable to regulate the type of crops being grown and the type of land management being followed, in order to enhance environmental quality. Intensive methods might be introduced to increase productivity and absorb some of the displaced farmers, thus allowing the same number of farmers to cultivate on a smaller land area. It is difficult to see how this might occur spontaneously without some kind of 'external' facilitation. It seems there is a strong argument, merely on the basis of equity, that vacant land in such cities should be set aside for cultivation and local government could usefully work with farmers to increase food supply, employment and urban incomes.

Considering the broader implications of the Kano study, there is no question that urban agriculture, is now making a significant contribution to livelihoods in burgeoning cities like Kano. The academic literature reviewed in this paper confirms that urban agriculture does supply poor producers with much-needed food and income, and provides the city's

inhabitants with an additional source of employment and fresh food supply.

However, thus far, much of the literature on urban agriculture has adopted a rather narrow focus on specific cities and has failed to present a broader perspective and critical analysis of urban agriculture as a significant feature of townscapes in many poor countries. There is an urgent need for more comparative studies of urban agriculture to be undertaken in order to appreciate its problems and potential in the context of broader development issues and strategies aimed at poverty alleviation (see for example, Binns and Lynch, 1998; Ellis and Sumberg, 1998; Smit and Nasr, 1992; Smith, 1998). There has developed, therefore, a considerable body of evidence that identifies the advantages of urban agriculture from a relatively restricted perspective. There is a much smaller body of literature that is rather more cautious, calling for a greater understanding of urban agriculture in relation to specific issues such as land tenure, health and environmental concerns. Indeed, the present authors have highlighted elsewhere the problems of using heavily polluted water on vegetable crops (Binns and Lynch, 1998).

Finally, it is suggested that new air photography and remote sensing technologies allow for relatively inexpensive management of an inventory of vacant lands in cities. This would facilitate more effective monitoring of the relationship between different land uses such as building construction, public open spaces and both cultivated and cultivable lands. Such inventories would reveal the true significance of food production in urban and peri-urban areas and provide valuable data for the planning process. It is important to recognise that the relentless development of urban areas, such that every space in the metropolis is eventually 'concretised', could lead to serious problems in the future for rapidly growing cities.

However, despite such rapid urban development, it seems likely that urban agriculture will continue to be a widespread response to the economic and social conditions faced by many poor individuals, households and communities in regions such as Sub-Saharan Africa. Perhaps what is needed is the promotion of parallel successful initiatives in other sectors, such as housing, employment and water supply, which can together create an 'enabling environment' in which self-help community-based initiatives are encouraged and supported.

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Figures

1. Horticultural production sites in Kano, Nigeria (Map)
2. The Kofar Ruwa production site (Map)

Photographs