Urban Farmers as an Extension Domain: The Case of Atteridgeville (Pretoria, South Africa)

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Abstract

A study carried out in the informal urban settlements of Atteridgeville, Pretoria, involving a survey (n=120), which employed face-to-face interviews using a structured interview schedule, complemented by semi-structured interviews and observations of agricultural production activities sought to characterise urban farmers as an extension domain. In the study area, participation rates in urban farming were high (54 % of households), and the majority of urban farmers consisted of unemployed middle-aged females, who tended to form part of households categorised as poor, and who had gained some experience in agriculture before their arrival in the township from rural areas. Agriculture was limited to crop and vegetable production, with livestock farming completely absent. Key constraints to urban farming in the area, currently and in the future, were the lack of secure land for agriculture and a lack of water. It is argued that these constraints may be addressed by closer involvement of government and the public sector, whose interventions may include the introduction of space-saving and water-saving technologies, whereby public extension could play an important role in technology transfer and farmer training.
Introduction

The United Nations Development Programme (1996) defined urban agriculture as an industry that produces, processes and markets food and fuel, largely in response to daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods using and reusing natural resources and urban wastes to yield a diversity of crops and livestock. During 1980s, the importance of urban agriculture accelerated dramatically throughout the world (United Nation Development Programme, 1996). Farming by urban dwellers has been related to declining purchasing power, and to urban poverty, which in turn is partly the result of the poor economic state of many countries, including most African countries (Chaipa & King, 1998). As a result, urban cultivation in many cities is essentially a survival strategy adopted by the poor to reduce their vulnerable condition (Rogerson, 1993). In South Africa, the importance of urban agriculture is also on the rise. According to May and Rogerson (1995) and Rogerson (1998) agriculture in the cities of South Africa is one of ways urban dwellers supplement their low incomes.

Urban farmers are defined urban as dwellers engaged in farming activities, i.e. crop or livestock production. According to Meadows (2000), people in Africa practice urban agriculture in order to reach self-sufficiency, to raise their level of household food security or to survive. As a result, the majority of urban farmers are from low-income groups, who engage in agriculture primarily for home consumption purposes. By producing their own food, they also improve their nutritional intake, because the food they grow is more nutritious than the food they can afford to buy (United Nation Development Programme, 1996). Research on urban gardening groups in the Cape Flats by Meadows (2000) showed that the majority of urban gardeners were female adults, whose engagement in agriculture was motivated by saving on household food expenditure and generating income through sales of surplus produce. In Mamelodi near Pretoria, Martin, Oudwater and Meadows (2000) reported that those involved in urban farming consisted mainly of elderly unemployed people.

Many South African NGOs and welfare organisations have recognised the importance of small-scale urban agriculture in terms of food security and social function, and they promote gardening activities through extension, training and occasional input supply (seeds, fertilisers). However, town planners and policy makers in South Africa tend to view urban agriculture as a way of prompting economic development, thus favouring highly organised intensive production systems (Martin, Oudwater and Meadows, 2000). This narrow view of urban agriculture has contributed to a lack of adequate policy, legal and institutional support, and other public services for the type of agriculture practised by the majority of urban farmers, who at present rely mainly on the non-governmental sector for assistance (Meadows, 2000).

Purpose and Objective

The purpose of this paper is to encourage the public extension system in South Africa to broaden its support to urban farming by contributing to the body of knowledge on this sector. The specific objective of the study presented in this paper was to define urban farmers in the informal settlements of Atteridgeville (Pretoria) as an extension domain for the purpose of extension interventions. Low (1986), cited by Williams, Rose, Eckert and Tapson (1989) defined an extension domain as a homogenous group of farmers, who share the same problems, and posses similar resources for solving these problems.
Materials and Methods

The study area

The study was conducted in the informal urban settlements (shanty towns) of Jefsville, Phomolong, Concern, Vergenoeg, and Brazzaville found along the southern edge of the formal African Township of Atteridgeville, which is situated approximately 19 km west of the centre of Pretoria, the capital of South Africa. These informal settlements came into existence in 1990 on land previously owned by the South African Defence Force (Theron, 2000). During establishment of these settlements, the provision of infrastructure was largely ignored. Even now, roads still consist of tracks, there is no electricity, and water supply is by means of a limited number of communal standpipes. The residential plots tend to be small, ranging in size between 100 m² and 400 m². The houses can best be described as shacks, because they are built from materials such as plastic, wood, cardboard and corrugated iron. There are no sanitary facilities inside the houses, forcing residents to make use of outside pit latrines.

Data were collected from August to October 2001, by means of a survey, which employed face-to-face interviews using a structured interview schedule. A multistage cluster sampling procedure was adopted for the selection of the sample. Aerial photographs taken on the 4th September 1999, on a scale of 1:4 000, were used to count the number of residences (sampling frame), and to delineate 114 primary neighbourhood clusters, which consisted of approximately 100 residences each. From these clusters 12 were selected randomly. Systematic sampling was applied to identify 10 residences within each of the 12 primary clusters, yielding a total sample of 120 residences, which represented a 1% sample of the total population of 11 400 residences. The interviews sought data on demography, income and expenditure, agriculture and life history of households occupying these residences. Additional information was obtained by means of semi-structured interviews and observations of agricultural production activities to verify and elaborate information gathered during the survey questionnaires. The survey data obtained were captured and analysed using MS Office Excel.

Households were classified into three income categories, namely, ultra poor, poor and non-poor. In 1999, the poverty limit for a family consisting of two adults and three children living in Pretoria was R1705.64 (Potgieter, 1999). The monetary value of this limit was adjusted to the time of the survey using the consumer price index supplied by Statistics SA (2001). This monetary value was then converted to the adult equivalent poverty line (May, 1996), which at the time of the survey amounted to R553.03 per adult equivalent per month. The number of adults equivalents (AE) in a household was determined by means of the formula proposed by May (1996), namely,

\[ \text{AE} = (A + \frac{1}{2} C)^{0.69} \]

whereby

AE = number of adult equivalents in household;
A = number of adults in household (household members aged 15 or older); and
C = number of children in household (household members younger than 15 years old).

Adult equivalent income (AEI) of a household was calculated by dividing total household income in cash and kind by the number of adult equivalents in the household. Households with adult equivalent incomes higher than the poverty line of R553.03 were considered not poor, and those with adult equivalent income lower than the poverty line were considered poor. The category of the poor was subdivided further into poor and ultra-poor whereby an adult equivalent income of R276.51 per month (half the poverty line) was used to
separate the two sub-categories. In the study a household was defined as consisting of all persons who usually ate and slept together, and who shared the same bundle of incomes. During the survey, respondents reported crop yields using a variety of units. The method described by Van Averbeke and Mei (1998) was used to convert the yields to monetary values, enabling analysis and comparisons of data.

**Results and Discussion**

Combined, the 120 households that were surveyed counted 532 members, yielding a mean household size of about 5 persons. Of these, 47% were male and 53% female, and 65% formed part of the economically active category of the population, aged between 15 and 64 years old. Nearly all the others (31%) were children. Of the active population, 43% were unemployed (actively looking for work), and 60% of the unemployed were women. More than half of the households in the sample (54%) were engaged in urban farming. On average, farming households tended to be slightly larger (5 members) than non-farming households (4 members) and heads of farming households were 6 years older than those of non-farming households. In both categories the gender of the head was male in four out of five cases. Also the marital status of the heads of households in both categories was similar. In farming households, 65% were married, 26% single with 6% widowed or divorced, while in non-farming households 64% were married, 33% single and 4% widowed or divorced. In both groups the majority of heads of household had at least eight years of formal education.

In both farming and non-farming households, income was derived mainly from salaries and wages. State transfers in the form of old age pensions, disability grants and child support grant were the second most important source of income. Together these two sources supplied 81% of the income of households in the sample. The majority (58%) of the households in the sample were poor, about 33% was not poor, and 8% was ultra poor. Although engagement in farming was proportionally most common among the ultra poor (63%), and least common among the non poor (45%), the differences in the relative frequency of farming among the three poverty categories were not statistically significant.

Urban farming in the informal urban settlements of Atteridgeville was limited to the production of crops and vegetables in home gardens, community group-gardens, and open urban spaces. Vegetables were produced in home gardens, and also in community group-gardens, established on land belonging to schools, clinics, cemeteries, and the local authority. Crops were grown mainly in urban open spaces, such as roadsides, and private land, made available to the community by owners. Production in urban open spaces was limited to summer, because of lack of irrigation. In terms of participation rate, farming in home gardens was by far the most important (Table 1). About 12% of the urban farmers were growing crops on urban open spaces, and 5% participated in group-gardens. The average size of a home garden plot was 25.9m², that of an open urban space was 350.9m² per individual, and the area of community garden land was 195.7m² per individual.

Farming in the informal urban settlements of Atteridgeville was done mainly by women (Table 1). Of the 65 urban farmers in the sample, 86% were female and 14% male. In most cases (51 out of 65), it was the unemployed spouse of the male head who did all the farming, but in a few cases (12) the male head assisted with preparation of the land. There were also 18 cases where children assisted their mother with watering and weeding during weekends and holidays.
Table 1: Gender of farmers in the informal urban settlements of Atteridgeville, Pretoria, and participation rates in different types of agriculture (September 2001, n=65).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home garden</td>
<td>48</td>
<td>6</td>
<td>54</td>
</tr>
<tr>
<td>Urban open space</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Community garden</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>56</td>
<td>9</td>
<td>65</td>
</tr>
</tbody>
</table>

The age distribution of the farmers is shown in Table 2. The average age of the women farmers was 48 years and that of male farmers 53 years. These results indicate that contemporary urban farmers in Atteridgeville were mainly middle-aged or old people, and that participation by the young was rare, and results are similar to those reported for Mamelodi (Pretoria) by Martin, Oudwater and Meadows (2000).

Table 2: Distribution of farmers by age in the informal urban settlements of Atteridgeville, Pretoria (September 2001, n=65).

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Female (%)</th>
<th>Male (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 – 30</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>31 – 40</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>41 – 50</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>51 – 60</td>
<td>36</td>
<td>70</td>
</tr>
<tr>
<td>&gt;60</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

A comparison of the origin of farming and non-farming households yielded differences that were statistically significant (P = 0.02). The origin of non-farming households was more likely to be urban than among farming households, who were nearly all (94%) first-generation immigrants from rural areas. They had arrived in Atteridgeville to look for work, or to join their spouses or parents who had migrated to the city. The rest (6%) grew up in other parts of Pretoria, and had moved to the informal settlements to escape rent payment, overcrowding and familial pressures to share their incomes. The rural origin of urban farmers was consistent with the finding reported by Van den Heever, Venter, Maphanga, Magoro, Kekana & Van Rooyen (1998). Consequently, it was not surprising that most farmers in the sample obtained their agricultural experience whilst still living in rural environments, but there were also some who learnt to farm whilst working on white-owned commercial farms. Among the few farmers of urban origin, trial and error was usually the way they had gained experience in agriculture.

Crop selection by farmers was influenced by type of production. Home gardeners preferred maize, Swiss chard and onions. Maize was the main crop grown in urban open spaces, where in many cases it was intercropped with beans, pumpkins and melons. Beetroot, tomatoes, carrots, cabbages, green peppers and lettuce were favoured by gardening group. On average, the productivity of urban agriculture in the study area, measured in monetary terms
per unit area, was highest in home gardens (R1.58 m²), followed by community gardens (R1.07 m²) and open urban spaces (R0.61 m²), as shown in Table 3.

Table 3: Size and productivity of different types of urban agricultural production units in the informal urban settlements of Atteridgeville, Pretoria (2001; n=65).

<table>
<thead>
<tr>
<th>Type of space</th>
<th>Mean size of individual units (m²)</th>
<th>Size range of individual units (m²)</th>
<th>Value/unit area (R m⁻²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home garden</td>
<td>25.9</td>
<td>8 – 70</td>
<td>1.58</td>
</tr>
<tr>
<td>Urban open space</td>
<td>350.9</td>
<td>180 – 560</td>
<td>0.61</td>
</tr>
<tr>
<td>Community garden</td>
<td>195.5</td>
<td>167 – 250</td>
<td>1.07</td>
</tr>
</tbody>
</table>

The most probable reasons for the observed differences in productivity were the prevalence of double cropping or year-round cropping in home and community gardens, and the occasional use of irrigation. Both these practices were absent in open urban spaces. As indicated earlier, the size of the production units per individual differed considerably depending on the type of space used. Consequently, the mean annual value of production per individual unit also depended on the type of space used (Table 4). Generalising the results of the sample to the study population of 11 400 households, the total annual value of production amounted to R211 000 in home gardens, R162 000 in open urban spaces, and R60 000 in community gardens. On average, urban farmers increased their household income by R70.11 per year or R5.84 per month. Most of this income was in kind, because all the produce from home gardens and urban open spaces was consumed at home (Table 4). The main reason for the absence of sales by home gardeners and users of open urban spaces was that the quantities produced did not provide for a surplus. Sales of produce occurred only in community garden projects, and this may explain the particular crop selection, characterising these projects.

Table 4: Mean value of production per individual production unit and allocation of produce by the farmers.

<table>
<thead>
<tr>
<th></th>
<th>Value of produce (R)</th>
<th>Value of home consumption</th>
<th>Value of gifts (R)</th>
<th>Value of sales (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home garden</td>
<td>41.11</td>
<td>41.11</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Urban open space</td>
<td>213.14</td>
<td>213.14</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Community garden</td>
<td>210.67</td>
<td>163.29</td>
<td>0.00</td>
<td>47.38</td>
</tr>
</tbody>
</table>

According to Lee-Smith and Lamba (1998), the most important input in urban cropping is water. In the study area, home gardeners used water from standpipes to irrigate their crops, which sometimes required the water to be carried to the gardens in buckets or tins. In community gardens farmers usually had access to water from taps free of charge, enabling them to practise irrigation by means of hosepipes. Production in urban open spaces was entirely reliant on rainfall, and therefore limited to the summer season. The use of chemicals (fertilisers and pesticides) was largely limited to community garden projects, and
even there their use was not widespread. Besides seeds, which they often saved from the previous harvest, and the hiring of a tractor to prepare the land, users of urban open spaces did not use inputs. Home gardeners used organic household waste and crop residues to increase or maintain the fertility of their soils. Crop residues were also used and always obtained from the farmers’ own gardens. About one in five home gardeners purchased seed from shops, 45% used seeds from the previous harvest, and the rest obtained them from relatives or friends. Tools used in home gardens and community gardens included hand hoes, spades, rakes and forks.

In terms of production, the main problems experienced by urban farmers in the study area were the unreliability of the water supply not only for agriculture, but also for domestic use, and crop damage by pests. Theft of crops was problematic only in urban open spaces. The majority of non-farming households (60%) identified a lack of land as the main reason for not engaging in agriculture, followed by lack of water (20%), lack of time (9%), inputs (6%), or knowledge (4%). The lack of secure land as a constraint in urban farming is a recurrent theme in South Africa, as indicated by the findings of May and Rogerson (1995) in Tembisa, Johannesburg, and Meadows (2000) in the Cape Flats near Cape Town.

Conclusions

The results of the study showed that the majority of urban farmers in the informal urban settlements of Atteridgeville consisted of unemployed middle-aged females, who tended to form part of households categorised as poor, and who had gained some experience in agriculture before their arrival in the township from rural areas. This segment of the population, therefore, constitutes the main target group for strategies geared at improving the practice of urban agriculture in the informal urban settlements of Atteridgeville. The most common complaints to be heard dealt with a lack of water and secure access to agricultural land. Growth in urban farming could benefit from closer involvement of government and the public sector, which to date was conspicuous by its absence in the study area. The study showed that urban agriculture mainly benefits the most disadvantaged sector of the urban population. A key concern awaiting intervention is the identification and securing of urban land for farming, and this could include the introduction of space-saving agricultural technology, such as vertical growing systems, especially for use in home gardens. Improving access to water, and the introduction of water-saving or recycling technology in urban agriculture are important areas for intervention also.

References


