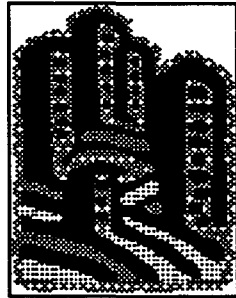
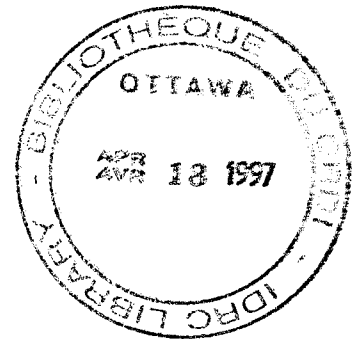


Urban Agriculture Research in  
East & Southern Africa II:  
Record, Capacities and  
Opportunities

by  
*Admos Chimbowu & Davison Gumbo*  
EDNA-Zimbabwe  
1993



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# URBAN AGRICULTURE RESEARCH IN East and Southern Africa II: RECORD, CAPACITIES AND OPPORTUNITIES

## INTRODUCTION

Urban Agriculture, just like other informal sector activities, has been conceptualized as a contrarian industry which grows against a cyclorama of deteriorating national economics. In the case of Southern Africa, this feature is an outcome of the current rates of urbanization in the region (see Table 1).

Table 1.

Urbanisation Rates in Southern Africa

COUNTRY	Urban Population (as a % of total population)			Average annual Growth rate (%)			Percentage of Urban Population					
	1965	1980	1987	1965	1980	1987	in largest city		in cities over 50,000		No. of cities of over 500,000	
	1965	1980	1987	1965	1980	1987	1960	1980	1960	1980	1960	1980
Malawi	5	10	13	6.6	7.9	8.6	-	19	0	0	0	0
Mozambique	5	13	23	8.5	11.5	10.7	75	83	0	83	0	1
Tanzania	5	17	29	9.1	13.4	11.3	34	50	0	50	0	1
Zambia	23	43	53	7.6	6.6	6.6	-	35	0	35	0	1
Lesotho	6	14	19	8.7	7.3	7.2	-	-	0	0	0	0
Zimbabwe	14	22	26	6.7	5.5	6.3	40	50	0	50	0	1
Swaziland	7	14	30	5.1	13.3	13.9	-	-	-	-	-	-
Botswana	4	19	21	18.4	10.3	8.1	-	-	-	-	-	-
Angola	13	21	26	5.6	7.0	5.8	44	64	0	64	0	1

Source: Osman (1990) p.5

It is quite clear that the region is experiencing fairly high rates of urban growth leading to problems of unemployment, poverty and homelessness. As economies have failed,

urban agriculture has become an alternative. Thus its rise to prominence has been enhanced by the economic austerity measures being implemented by most African Governments. The economic structural adjustment programmes have stretched urban household economy to the limit. The urban low-income households have been affected the most and have sought to supplement incomes and improve family nutrition through urban agricultural indulgence. While the concept and practice of urban agriculture is not new to Eastern and Southern African cities (Ledogar, 1978), there is a paucity in empirical studies to characterize this field. A review of some of the studies done to date ascertains some of the strengths and weaknesses of the research record. The premise here is that like other conceptual issues, Urban Agriculture is epistemologically determined within the larger or wider framework of agricultural activities in society.

## **1. REGIONAL RESEARCH RECORD: STRENGTHS AND WEAKNESSES**

Most of the studies have been carried within the context of three broad paradigms. The first group of studies falls within what we would term the planning paradigm. The epistemological significance of this is that the studies are preoccupied with landuse arrangements within the city and therefore relate to urban agriculture as a deviation from formally recognized or expected landuse arrangements within the city. Most of the earlier urban agriculture studies held under this paradigm dominated by planners and geographers are baseline descriptive studies of the location of agricultural activities in space. This bias towards spatial distribution seems to be a factor induced by the training in the planning and geographical distribution. Studies by Mazambani (1982), Lado (1991) and Bowa et al.(1979) are examples of studies answering the what and where questions in the city.

The second research paradigm to urban agriculture relates to the socioeconomic *cum* industrial geography of the city. These look at urban agriculture within the context of urban informal sector studies. We will not look at the epistemic foundations of urban informal economy here, suffice to say it has often been wrongly conceptualized as subservient to the formal economy. We look at the urban economy as a "whole" that has several parts complementing each other. Urban agriculture while not being entirely conceptualized as a preserve of the urban poor is seen as a survival strategy. The majority of studies done to date look at urban agriculture in this fashion. These studies conceptualize urban agriculture as a contrarian industry thriving as the economy takes a plunge and are mostly concerned with the why and how aspects of urban agriculture. Most of the studies by Rakodi (1985, 1987, 1988), Jaeger (1982), Lado (1990), Mazingira Institute (1985) and the study by Maxwell and

Zziwa (1990) fall under this paradigm. Most of these studies, while being baseline, assume analytical overviews of urban agriculture practitioners.

The third research paradigm is essentially a hybrid of the two and perhaps forms the most comprehensive paradigm. These studies assume a holistic approach to urban agriculture. They look at locational and functional or operational dimensions of urban agriculture both as a land use and within context of the urban economy. The studies by Mosha (1991), Smit and Nasr (1992), ERI (1992) which look at the spatial attributes of urban agriculture as well as the economic, ecological and social context of this indulgence fall in this category. It must be said, however, that the studies by Smit and Nasr (1992) and WRI (1992) do not specifically refer to the regional experience of Southern and Eastern Africa although in general they contribute valuable starting points.

From this classification, it can be said that a lot of baseline studies have been done under the informal sector studies banner. The paradigmatic significance of these studies is that they establish the baseline for Urban Agricultural Research in the region. Looking at their content, most of the published studies are on Zambian experiences although Kenya and Tanzania have had their experiences reviewed. Scant attention has been paid to urban agriculture in Zimbabwe, Botswana, Mozambique, Malawi, South Africa and Uganda. There is paucity of published information in these six countries.

### **1.1. Aspects and specific objectives best researched:**

Most aspects of the URB Program's objectives have received scant attention. Significant contributions have appeared in the informal sector conceptualization of urban agriculture. These contributions are largely production oriented and look more at labor dynamics role of urban agriculture to the urban household. Most of these studies look at the location of urban agriculture activities and postulate reasons for the observed spatial patterns in urban agriculture. The studies largely concentrate on cultivation agriculture. The following conclusions can be derived from these contributions.

a) From the Eastern and Southern Africa Region experience, urban agriculture is an economic activity which in the majority of cases is not supported by most local government authorities except for tacit tolerance in Zambia, Tanzania and Kenya. In Zambia, Rakodi (1988) has shown that the modicum of interest shown to date falls short of requirements, while in Tanzania and Malawi urban agriculture is only tolerated in new cities which take cognizance of this activity in city planning (RCD, 1992; Mosha, 1992). The South African

case is blurred by political forces although urban agriculture is prevalent in Black townships.

In Zimbabwe, the implementation of the city landuse plans with crusading overzealousness has suppressed this activity but not with success (Mazambani, 1982). It is not clear whether the paucity of urban agriculture practices in Botswana is a result of urban policy. In Mozambique, tolerance seems to have been a *de facto* gesture to allow food production to ease shortages caused by the war in the countryside.

b) It is apparent that potential for input supply abounds if officials change their attitudes with regards to urban agriculture. Major inputs are readily available and transport constraints are largely absent although the case input constraints still exist (RCD, 1992; Rakodi, 1985). What is needed are credit facilities. This issue is complicated by the absence of security of tenure. Not much can be invested in a venture whose future is uncertain (Rakodi, 1988).

c) There is barely any extension activity among urban agriculture practitioners. This is largely because as a land use, it has never been formalized and can therefore not expect official support services. Given these and other inputs, there is scope for intensification of production.

d) Studies indicate that there are limitations in this venture. These range from theft, harassment by local authorities to shortage of water. With improvements in the water supply, there is scope for intensification of urban cultivation activities.

e) While local authorities may be more tolerant to urban agricultural activities, legal paraphernalia inherited from the colonial era need to be changed as they are still hostile to urban agriculture (Mosha, 1991; Mazambani, 1982). RCD Consultants (1992) have shown that Zambia's Lusaka, and Tanzania's Dodoma are exceptional cases brought about by external aid considerations.

It is only when it appears as an informal activity on vacant land (becomes a spontaneous activity) that it is deemed illegal. In its legal forms, urban agriculture is practised in backyard gardens, in peri-urban locations (as horticulture on land in transition).

f) Cultivation activity in urban agriculture is an activity dominated by women whose motive for production range from income generation to supplementing family diet (Bay, 1982 and Rakodi, 1988). This factor has implications for future extension work and technology

choice. RCD (1992) and Smit and Nasr (1992) also show that this activity also includes more youths and men than in rural areas.

g) Most of the people involved in urban agriculture are from the low-income bracket (urban poor) who are therefore resource poor. With a modicum of inputs, however, they manage to make ends meet. RCD Consultants (1992) have, however, shown that middle and high-income groups also practise this for different reasons other than basic survival.

h) Urban agriculture is mostly concentrated around homes and in vacant or infill areas (Mazambani, 1982; RCD, 1992; Mosha, 1991 and Rakodi 1985). Where rain-fed urban agriculture is practised on land unsuitable for building, this land is usually marginal and the likely impact of cultivation on some of these lands is not known. It is necessary to look further at the ecological impact of urban cultivation activities.

i) Urban cultivation/agriculture is not only the preserve of the informal sector. Aspects of livestock production are also practised by some local authorities as secondary purification of recycled water. Recycled water is used to water pastures for livestock production in peri-urban locations (Mwiraria et al., 1991). Horticultural activities in peri-urban locations where planning permission has been granted also exist in the urban-rural fringe zone.

j) Urban land use planning has tended to ignore urban agriculture and the needs of the urban poor. The design of urban housing for low-income groups ironically gives little space around homes for urban agriculture. Ways of providing land for urban agriculture will have to be found. The major constraint is that the cost of servicing of stands increases with the size of stands so provision of more land around homes would increase the cost of low-income housing. If security for crops is improved, making use of infill areas is an alternative solution. There is, however, need for participation of local communities in designing housing needs of the low-income groups. The case of Lusaka's squatter upgrading and Tanzania's new city Dodoma are perhaps cases in which local authorities have inculcated felt needs of the urban agricultural practitioners into city plans.

## **1.2. Aspects requiring further research**

A number of contributions to the urban agriculture discourse raise questions for further research. The first issue relates to the major input which is also a limiting factor to production: land. Perhaps the questions raised by Rakodi (1988) are pertinent to this issue since subsequent studies have not addressed these crucial questions.

It is necessary to ascertain how landuse zoning systems can accommodate urban agriculture. The approaches in question relate to whether this need for land should be satiated by increasing house stands for low-income groups or should land be set aside adjacent to these residential zones. This issue is also related to the development of a methodological framework which includes popular participation in plan preparation while providing scope for estimation of land for urban agriculture.

Very little is known about the actual production levels in urban agriculture. It is imperative that these be ascertained with a view to having them improved. Ascertaining production level within context of household needs provides scope for production constraints diagnosis and hence enables informed solution formulation. Particular attention may have to be paid to issues relating to extension and credit needs of urban agriculture with a view to having them addressed through a support system. This aspect is vital since an understanding of needs precedes any establishment of urban farmer support system.

In view of the paucity in studies on urban management and its impact on urban agriculture, it may be necessary for more studies to focus on styles of urban management and how they affect urban agriculture. Particular attention may have to be paid to pieces of legislation inimical to urban agriculture with a view to reconciling these with urban agricultural practices when they are amended. It may also be necessary to look at enabling legislation that will be required to provide scope for support of agricultural activities in urban areas.

To avoid duplication of effort among existing institutions, it may be necessary to explore the effect of extending the mandate of farmer support systems to urban areas.

Fewer studies have attempted to look at ecological or environmental effects of urban agriculture although it is quite apparent that peri-urban cultivation takes place on land deemed unsuitable for building activities. The ecological impact of urban agriculture needs to be explored particularly its impact on water quality and general land degradation. This is



important as it points to sustainability of urban agriculture over time. Related to this are explorations of the linkages between urban agriculture and fresh water withdrawal to see if it is sustainable. This can be broadened to look at possible contributions from wastewater utilization and soil management practices that make use of solid waste from urban zones.

An urban agriculture market study may be necessary to establish existing output disposal systems with a view to strengthening them and making them more reliable. Particular attention needs to be paid to market decision environment, competition and possible accessibility to official marketing channels through quasi-state bodies.

### **1.3. Interrelations between urban agriculture, water, waste and disaster:**

Adopting a systems approach to the study of urban geography often conceptualizes cities as open systems drawing resources from their surrounding zones (Smit & Nasr, 1992). Conceptualizing them as Islands of privilege, they receive resource inputs, process them and discharge residue as effluent waste. Urban agriculture provides scope for transforming urban settlements into self-sufficient entities moving towards a closed system. Instead of churning out effluent, it provides opportunities for recycling water and reclaiming land thus becoming an effective and productive way of waste management in cities. Since water and land are limiting factors to urban agriculture in cities of the region (Rakodi, 1988; Mazambani, 1982; Mocha, 1991), wastewater management and wasteland reclamation could ease these problems. Making use of water from secondary purification sources can enhance urban agriculture while at the same time reducing water consumption in the city. Reclamation of wasteland for use in urban agriculture improves the city scape. Added to this are nutritional gains resulting from improved food supply.

Let us take a closer look at some of the issues raised so far. It has been mentioned that wastewater can easily be utilized in urban agriculture, thus, easing the pressure on water in urban areas, since fresh water withdrawals for urban agricultural practices are unsustainable because the water is required for domestic purposes. This is particularly pertinent in view of the fact that most cities in the Region suffer from inadequate water supply.

Zulu (1990) has shown that while the city of Dar es Salaam needs 80 million gallons of water a day, it has a 25% shortfall and the National Urban Water Authority (NUWA) has nightmares trying to meet this shortfall. Gumede (1990) has also shown in the case of Mozambique how the overstretched urban services have virtually broken down as economic

woes brought about by the civil war and austerity measures take their toll on support services. A similar scenario exists in Angola, Uganda and Namibia. Zimbabwe, Zambia, Malawi and Kenya's cities are also bursting at the seams as drought and economic hardships force more people onto the streets. Recycling of waste offers opportunities for income generation among the urban poor while the use of wastewater reduces the strain on water supply in addition to purification cost reduction.

Wastewater in different stages of purification can be utilized in several ways as Smit and Nasr (1992) have shown. Most Third World cities already use wastewater to irrigate pastures for council agricultural ventures in the peri-urban vicinity. For example, in Zimbabwe, Harare and Bulawayo city councils own farms within the cities for this purpose. Instead of discharging wastewater directly into rivers it could be made more useful in this way. The councils generate income from these farms thus reducing the cost of purifying water. Problems have been noted, however, with the use of wastewater in urban agriculture, the most critical being the existence of pathogens and vectors which pose serious health hazards if not carefully handled.

Solid waste also forms a valuable input into some urban agriculture ventures. Contributions of organic solid waste to soil fertility need not be underscored within the urban areas where industries and residential areas churn out a lot of organic solid waste. Inorganic solid wastes are also useful in different ways. For example, some chemical residue are essential additives to the soil nutrient components. With proper waste management, urban wastes could be turned into valuable resource inputs for urban agriculture. This becomes particularly pertinent when we consider the volume of solid and liquid waste generated, e.g. Bulawayo generates 410 tons per day of solid waste (Mwiraia et al., 1991:53). So far, we have only looked at how solid waste and wastewater relate to urban agricultural ventures as valuable inputs. Let us also take a cursory look at the likely impact of urban agriculture ventures on environmental quality. We concern ourselves here with water and aquatic life within urban areas.

According to the World Resources Institute (1992) existing evidence indicates that runoff of fertilizers, herbicides and pesticides into urban rivers or streams is a significant source of water pollution. RCD Consultants (1992) and Rakodi (1988) have indicated the widespread utilization of herbicides, insecticides, fungicides and fertilizers to enhance production. In view of the enhanced runoff in urban areas due to tarmac surfaces and artificial roofs, there are high chances of increased water pollution in urban areas as a result of increased urban agriculture activities. Perhaps, there is a case here for alternative

agriculture, in particular low-input agricultural systems which promote reduced use of chemical fertilizers and other chemicals. The use of a lot of chemicals in urban agriculture production has also been linked to the bioaccumulation of heavy metals and synthetic organic compounds in aquatic life, particularly fish. The WRI (1992) pinpoints agriculture as the leading nonpoint source of water pollutants like sediments, pesticides and nutrients especially nitrogen and phosphorous. It has been observed that regular consumption of fish and other aquatic products from contaminated sources is injurious to fetus development and has side effects on young children. Table 2 characterizes some of the ecological implications of aspects of urban agriculture.

**Table 2.**

**Sources and Impacts of Selected Pollutants**

<b>Pollutant</b>	<b>Source</b>	<b>Impact on Aquatic Organism</b>	<b>Impact on Human Health and Welfare</b>
Sediment	Agricultural fields Pasture livestock feedlots, logged hills degraded streambanks road construction.	Reduced plant growth & diversity and reduced prey for predators; clogging of gills & filters; reduced survival of eggs and young smothering of habitats	Increased water treatment costs; transport of toxins and nutrients; reduced availability of fish, shortened lifespan of lakes, streams & artificial reservoirs and harbours.
Nutrients	Agricultural fields, Pastures, landscaped urban areas; raw & treated sewage discharges and industrial discharges	Algal blooms resulting in depressed oxygen levels & reduced diversity and growth of large plants; release of toxins from sediments, reduced diversity in vertebrate and invertebrate communities; fish kills.	Increased water treatment cost; risk of reduced oxygen-carrying capacity in infant blood; possible generation of carcinogenic nitrosamines; reduced availability of fish, shellfish & associated species impalement of recreational uses.
Toxic Chemicals	Agricultural runoff Municipal and industrial discharges Leachates from landfills	Reduced growth and survivability of fish eggs and young; fish diseases.	Increased costs of water treatment; increased availability and healthfulness of fish, shellfish and associated species.

After WRI (1992) p.162

It is apparent from Table 2 that if not carefully designed, urban agriculture can lead to an urban ecological disaster. The gains obtained through the fungible use of self-produced food (RCD Consultants, 1992:21) could be lost due to the increased water treatment costs being passed on to the consumers.

Mosha (1991) has also shown that uncontrolled livestock keeping practices within urban areas have resulted in several negative externalities in urban life quality. Dumping of animal dung in house compounds along roads and other vacant land is common place. The result is that flies and other bacteria thrive (particularly the tetanus bacteria), compromising the city health. Besides this, urban livestock in Dar es Salaam has exposed people to zoonotic diseases like tuberculosis, leptospirosis, anthrax, salmonellosis and brucellosis. If not carefully controlled, urban livestock production can turn out to be a health hazard with disastrous effects. Before calling for radical transformation in attitudes towards urban agriculture, it is imperative that detailed research be carried out to clearly understand the ecological implications of this venture which, while being economically sound in the short term, may end up being a classic case of ecological disaster in the long term. Such statements emanate from the realization that the urban environment is an artificial one and ecological systems there have already been changed and may be in a state of flux.

## **2. APPRAISAL OF RESEARCH CAPACITY**

From the modicum of contributions to urban agriculture research, it is possible to identify several research organizations and institutions. Perhaps as a starting point one could look at the Association of Rural and Urban Planners in Southern and Eastern Africa. Affiliate organizations and individual scholars have made significant contributions to urban management studies. The Association of Rural and Urban Planners in Southern and Eastern Africa runs regional workshops and disseminates information through its publication, the *Review of Rural and Urban Planning in Southern and Eastern Africa*. Affiliate institutions and scholars working under its auspices include:

Prof. A. R. Mosha  
University of Dar es Salaam  
ARDHI Institute  
Tanzania

Dr. R. M. K. Silitshena  
Department of Environmental Sciences  
University of Botswana,  
P Bag 0022, Gaborone, Botswana.

D. M. Kiamba  
Department of Land Development  
University of Nairobi, Kenya

Mazingira Institute  
Kenya

Prof. P. S. Maro  
University of Swaziland

Dr. E. S. Kalapula  
Department of Geography  
University of Zambia

Prof. A. S. Kauzeni  
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D. J. Gumbo  
ENDA-Zimbabwe  
Environment Resource Management  
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Urban Community Research Unit  
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Makerere Institute of Social Research  
Makerere University  
Uganda

Chancellor College  
Malawi.

Eduardo Mondlane University  
Mozambique.

Most of the institutions and contact persons listed above have either published some literature on urban agriculture or have done some research in urban management. It must be mentioned, however, that most of these institutions have only paid scant attention to urban agriculture. Perhaps the most notable effort is the case of Kenya where NGO initiatives through the Mazingira Institute characterization study of urban agriculture. The University of Dar es Salaam's ARDHI Institute has now taken interest in the urban agriculture practice. If recent contributions by Mosha (1991) are indications of growing interest, the case of Zambia is however more interesting. Rakodi has been able to do a series of surveys in Lusaka through ODI funding. Students from University of Zambia have also done several projects on gardening activities. Substantial contributions have also come from the Institute for African Studies' Urban Community Research Unit at the University of Zambia. One student has actually written a Ph.D dissertation on "Urban agriculture: A Strategy for Survival in Zambia", University of California in Los Angeles (Sanyal B., 1984). Notable contributions have come from Makerere University's Institute of Social Research. In the case of Zimbabwe, the only notable contribution has come from D. Mazambani (1982) who wrote an M Phil dissertation on peri-urban cultivation, submitted in the Department of Geography at the University of Zimbabwe. The department of works of the Harare City Council has however carried out snap surveys although these are poorly documented. Drakakis-Smith (1991) has done quite some work on food supply in Harare but scant attention is paid to urban agriculture. There is however extensive coverage of this activity in newspaper reports. The reports concern themselves with urban management responses to this practice.

The cases for South Africa, Malawi, Namibia, Angola and Botswana are largely void of published studies on urban agriculture. Perhaps, as a starting point, state-of-the-art papers are a necessity. Correspondence with contacts in South Africa indicates that the University of Natal's Centre for Social and Development Studies has done some work within the framework of urbanization and informal sector studies.

There are no courses on urban agriculture offered at most institutions in the region and a look at agriculture, economics, planning, geography and sociology courses outline and content shows that no attention is ever paid to urban agriculture. Scant attention is only paid to it in informal sector studies. In view of the contribution of urban agriculture to the urban economy there is perhaps a case for support to more research initiatives in this area. As a starting point, what is perhaps required is institutional support to research organizations and institutions to fund the research initiatives.

In our view, there should be support for both fundamental and applied research in all

the institutions. What is required in the subregion as a start is fundamental research that leads to comprehension and explanations of observed agricultural practices from a theoretical point of view. Theory research could concentrate on location/spatial and socioeconomic aspects of the practice. This is perhaps what is required for long-term social and policy orientation. On the other hand, armchair theoretics or ivory-tower dwelling that does not look at the practical relevance hampers progress. Operationalization of some of the fundamental research contributions should match this effort on the ground. We argue here for a balance in fundamental and applied research. We seek evaluative theories that integrate social processes with spatial form. Perhaps the concept of phenomenology provides scope for this envisaged integrative theoretical framework.

### **3. FUTURE RESEARCH OPPORTUNITIES**

#### **3.1. State-of-the-art papers**

Since relatively few studies have been done concerning urban agriculture in the region, as a starting point what is perhaps required are state-of-the-art surveys by country. These surveys (which can exclude Kenya, Tanzania and Zambia, because these seem to be known cases already) should address themselves to the following questions.

- What types of urban agriculture exist in the cities and what is the motive for production?
- Who practices urban agriculture? Are there class differences? If any, define and characterize these.
- Where does urban agriculture occur in the cities and what is the type of response from local authorities?
- Are there any institutions which support urban agricultural activities (input supply and output marketing)?
- Appraise the management and legal paraphernalia with regards to "enabling" or "curtailing" urban agricultural activities.

These state-of-the-art papers could then be presented at a regional workshop. Using existing literature, there are several issues raised which could be pursued further in the region.

**3.2. Title: Decolonising urban management practices in Zimbabwe. Institutional *cum* legislative paraphernalia and urban agriculture: Towards a convergence and symbiosis in an urban economy.**

**Research problem:**

Tenants of colonial urban administration and management which are embedded in the Regional Town and Country Planning Act (1976) are generally hostile to urban informal sector activities and in particular landuse economic activities deviating from rigid plans. This hostility occurs against a background of a declining national economy and an increasing or thriving informal sector. This study seeks to work towards an enabling environment for the informal landuse activities, particularly urban agriculture.

**Research questions:**

- How important is urban agriculture to urban economies in Zimbabwe (to whom is it important and in what ways)?
- What constraints are faced by the practitioners?
- What responses has it elicited from local authorities?
- What institutional and legislative support exists for such practices (input supply and output marketing)?
- How can an enabling environment be created?

**Objectives:**

- a) to determine the economics of urban agriculture in major Zimbabwean cities;
- b) to identify institutional and legislative constraints to urban agriculture; and
- c) to determine how best to enhance urban agriculture in Zimbabwean cities.

A participatory approach will be used to execute the research process. This will entail working closely with the urban farmers to be able to fully conceptualize their activity environment. This approach has been successfully utilized among rural communities elsewhere in Zimbabwe in surveys done by ENDA-Zimbabwe. A multi-method research methodology will be utilized to capture the required information.



**Expected results:**

- Policy recommendations on how best to create an enabling environment to make cities produce their own food.
- Better understanding of urban agricultural practices constraints and prospects for improved performance.
- Theoretical contributions — characterization of urban agricultural practices.

**3.3. Title: Use of agrochemicals in urban agriculture and its possible ecological effects.****Research problem:**

Urban agriculture practitioners are thought to use more chemicals inputs to enhance production on the limited amount of land available. It has been observed that because they have easy access to these chemical inputs urban agriculture practitioners use more inorganic chemical inputs than their rural peers. The efficiency of use of these is not known since no production studies have ever been done. Similarly, the possible ecological effects of those inorganic chemicals have never been determined in cities of the subregion. This study aims to determine the use and use patterns of the inorganic chemicals in urban agriculture. It is also hoped to determine if there are significant differentials in production levels among the various practitioners of urban agriculture.

**Research questions:**

- Which urban agriculture indulgences require chemicals most?
- How do the practitioners obtain chemicals and who teaches them on use? What are the use patterns?
- Are there significant differences in production levels between the families which use chemical inputs and those which do not?
- What are the likely impacts of the use of these on the urban ecology?

**Objectives:**

a) to determine the nature of use and use patterns of chemicals inputs in urban agriculture;

b) to determine production variances among user and non-user groups; and

c) to establish the possible ecological backlashes of increased use of chemicals with a view to coming up with policy recommendations on the use of these within urban environs.

**Expected results:**

- Policy recommendations on the forms of urban agriculture harmonious with urban ecological concerns.
- Policy information on ecological/environmental monitoring of urban agricultural practices.

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