Getting the policy right: Urban Agriculture in Dar Es Salaam, Tanzania

Abstract:

This paper examines some of the obstacles faced by urban agriculture practice in Dar Es Salaam, Tanzania, including an ambiguous regulatory environment, institutional priorities, perceived health hazards, urbanisation pressure, and insecure tenure arrangements. It also examines the role of both the national government and local municipal councils in addressing some of these issues. At the national level, investment prioritisation, institutional reform, in particular the Ministry of Agriculture and Food Security and the Ministry of Livestock and Fisheries, in order to be successful and to address the myriad of problems facing it, and to better facilitate, promote, and coordinate urban agricultural activities, and information dissemination. At the local level, incorporating urban agriculture activities into the planning process to ensure that agriculture is recognized as a major activity in urban and peri-urban areas, providing the appropriate incentives as well as clear and straightforward regulatory environment.

Introduction

Rapid urbanisation in sub-Saharan Africa has led to serious concerns over household food security in urban areas. Urban Agriculture, which includes both crop production and livestock raising, has been recognized as serving an important role in the economic, social, and dietary life of many cities in sub-Saharan Africa. In addition to being an important source of fresh produce, meat, and dairy products for consumers, it plays a vital economic role as a source of income for producers and distributors, increases food security, alleviates poverty, and also serves a socializing function for farmers, communities, and neighborhoods. In addition, urban agriculture also has a number of secondary impacts, including reducing food transportation costs
and providing environmental benefits such as recycling waste Lee-Smith (2010). Whether practiced at the subsistence level or undertaken as a way to supplement income by a professional, urban agriculture is widely practiced and an integral component of the urban environment.

Dar Es Salaam, Tanzania, one of the fastest growing cities in sub-Saharan Africa, faces a number of problems associated with such growth, including adequate food security, access to clean water, adequate housing, employment and education, and the provision of basic services and infrastructure. Agriculture addresses some of these concerns by serving as an important source of locally available produce and employing a substantial number of people. Due to the widespread absence of processing, storage, and distribution facilities in Tanzania, urban agriculture will continue to play a vital role in the social, economic, and nutritional life of the city of Dar Es Salaam. However, although urban agriculture has been recognized as serving an important role in the provision of food and income in Dar Es Salaam, the practice is largely unregulated, unplanned for, and faces a myriad of institutional, organizational, economic, and environmental problems. The purpose of this paper is to examine some of the obstacles and hindrances face by practitioners of urban agriculture in Dar Es Salaam, Tanzania and discuss some potential policy solutions.

**Background**

Like much of sub Saharan Africa, Tanzania is rapidly urbanizing. In 1970 the urban population was 7.9 percent of the total population; currently the urban population is 26.4 percent, much of this growth occurring in Dar Es Salaam, which contains nearly 30% of the total urban population (UN, 2010). Moreover, Dar Es Salaam is growing more quickly that the national average. While the estimated annual population growth of Tanzania was 3 percent between 2005 and 2010, the city of Dar Es Salaam, with an estimated 2010 population of over 3.3 million had an estimated annual growth rate of almost 5 percent during the same time period (UN, 2010).
Much of this growth has been along a number of major arterials, resulting in a radial spatial development pattern. The provision of infrastructure, services, and facilities is uneven and has not kept pace with the rate of development. Poorly serviced areas remain between the arterial roads (Hoogland, 2003).

Food security, particularly for the burgeoning urban population, has been an issue since the food crises of the 1970-1980’s. A Tanzania Food and Nutrition Center report (TFNC, 2006) on food security status estimated that approximately 20% of the total population of Tanzania (35 million) faces chronic food insecurity, and a further 40% have experienced periodic food insecurity. Urban agriculture, including both plant and animal husbandry, is an integral part of the local food system in Dar Es Salaam, providing fresh vegetables including Chinese cabbage, tomatoes, spinach, amaranths and a variety of other greens, sweet potato, cassava, maize, pulses, and fruits such as cashew, coconut, banana, pineapple, and papaya. In addition, eggs, poultry, milk, and meat are also supplied locally. Moreover, farming is an integral component of economic life in the city. Incomes are sustainable and can rival those of government employees. The city of Dar Es Salaam is comprised of 3 municipal districts; Ilala, Kinondoni, and Temeke. In total there are 7,700 farmers in Temeke municipality, 12,000 in Ilala and 15,000 in Kinondoni (Hoogland, 2003). A significant proportion of these farmers are full time, and are able to adequately support themselves and their families. In Ilala municipality, approximately 13% of the population is engaged in agriculture and over 10,000 hectares are devoted to urban agriculture. In Temeke municipality, about 60% of the available arable land is under cultivation and approximately 20-30% of the milk consumed is produced locally. In Kinondoni municipality, approximately 60% of the available arable land is under cultivation. Locally grown
urban agriculture provides approximately 7% of total food requirements, but 34% of livestock needs.

The practice of urban agriculture has traditionally been associated with recent rural migrants, and has consequently been interpreted as a mechanism for survival and a means to reduce household vulnerability to economic fluctuations brought on by fiscal constraints, structural adjustment, and governmental policy (Briggs and Mwamfupe, 1998). As such, urban agriculture was actively discouraged by the national government, which perceived it as economically inefficient and marginal in relationship to the overall economy. However, governmental policies and attitudes toward urban agriculture have changed over the years. Financial constraints during the 1970s and 80s, an era marked by declining minimum wages and food price inflation (Binns and Lynch, 1998) and Julius Nyerere call for self sufficiency raised the profile of urban agriculture in the eyes of policy makers, although translating this appreciation into policy has been more difficult.

However, in recent years urban agriculture has been increasingly undertaken by wealthier households, and has shifted in focus from household consumption to commercial sale. Government employees engage in farming, in particular the keeping of livestock, as a means to augment their income, which has not kept up with inflation. Instead of merely a means for survival, urban agriculture has become an area of potential investment for some, particularly if they can afford to purchase and maintain livestock. Often in such cases, the reason for keeping livestock may not necessarily be to subsidize existing income, but rather a form of cultural status, and a nod to their particular region or ethnicity of origin. As a result, urban agriculture has become increasingly fragmented according to socioeconomic status. Mlozi (1997) finds that
wealthier farmers tend to have larger lots, keep more livestock, and are more knowledgeable, while the less wealthy tend to keep gardens for vegetable production (Mlozi, 1997).

Moreover, it is no longer necessarily recently arrived rural migrants who are engaging in the practice. Stevenson et al. (1994) show that urban farmers are rarely recent migrants, and have generally lived in town for 10-15 years, suggesting that access to resources necessary for farming can be obtained only if a resident is well embedded in the social system (Stevenson, Kinabo and Nyange, 1994). In addition to being fragmented by class, urban agricultural practices are also spatially fragmented and are dispersed across the city. Vegetables are produced in fenced in backyards, on vacant lots, and open spaces under generally insecure tenure arrangements, scattered across the city. Moreover, spatial patterns of production change over time, as landowners develop or sell their property, and farmers are forced to relocate elsewhere.

Policies affecting urban agricultural practice are formulated at both the national level, though the various ministries and agencies affecting agricultural production, through the investments and activities of NGOs and donor agencies, and through land use decision making at the local level. The Dar Es Salaam City Council (DCC) is responsible for the administration of the city and urban agriculture has been included in the city ordinances and by-laws. In 2000 the administration of Dar was decentralised through the establishment of three municipalities (referred to as districts in rural areas); Temke, Ilala and Kinondoni, with Dar City Council responsible for those interests that affect all three municipalities. The three municipalities are independent administrative units, with a District Commissioner, a committee of chosen councillors, an independent revenue source and administrative staff. All three include a department of agriculture (headed by a Municipal Agriculture and Livestock District Officer).
and extension services to promote urban agriculture through funds and by providing training services. Moreover, the municipal councils are responsible for land use decision-making.

However, although urban agriculture has been recognized as serving an important role in the provision of food and income generation in Dar Es Salaam, the practice is largely unregulated, unplanned, and faces a number of problems. These include 1) a general lack of awareness of the role urban agriculture plays in the dietary, economic, and social life of urban residents and consequent marginalisation of agriculture by government officials and city planners, 2) an ambiguous and poorly enforced legal environment for urban farmers, 3) insecure tenure arrangements and fear of expropriation of farmers, 4) rapid urbanisation and competition for space, particularly in the peri-urban areas coupled with a lack of protected lands reserved for agriculture, 5) an institutional environment at both the national and local level generally biased against the practice of urban agriculture and a consequent lack of support for the specific needs of practicing farming in an urban area, and 5) public health concerns over the relative safety of urban agricultural products, particularly as irrigation is often intermittent and waters sources are often dependent on polluted sources. I now review each of these in turn.

**Legal environment**

Currently, no national policy exists in regards to urban agriculture. As a result, the various ministries which deal in some way with agriculture do not have a common reference point from which to craft policies and regulations in regards to urban agriculture or that may affect urban agricultural practices. The legal environment at the local level for urban agriculture is also somewhat ambiguous (Sawio, 1998). These ambiguities are partly the result of inadequate knowledge and understanding among residents and decision-makers on the role of urban agriculture. In 1982, responding to degradation of urban environment by livestock, local
authorities re-enacted the moribund by-laws of 1949 for controlling livestock (Animal By-laws of 1982 of the Local Government Act (no 8 section 80 of CAP 378). These by-laws are primarily geared toward the keeping of livestock, and are as follows; a) No person shall keep any animal within the City Area unless he/she shall obtain a permit from the City Director, b) No person shall keep more than four cattle in any City Area, c) No person shall graze any animal within the City Area, only zero-grazing is advocated, and d) Subject to any permit issued under these by-laws allowing animals to be moved, all animals within the City Area shall be kept in a building, structure or enclosure. In regards to vegetable production, the bylaws state that fruit and vegetables should not obstruct the sight of roadways. Furthermore, growing crops is not permitted within 14 meters of roads, and in river valleys crop cultivation is not allowed within 15 meters of the riverbank (although farming is permissible, and even encouraged, within river valleys in general) (Mlozi, 2003).

However, the bylaws, which have never been amended or updated to reflect current conditions or issues such as water pollution, present a number of issues. First, several ambiguities remain. For example, it is unclear which animals are permissible. The spatial extent is also unclear – do the bylaws refer only the urbanized areas of the city, or do they refer to the peri-urban areas as well? In addition, the procedure for obtaining permits is not explained. Second, some of the by-laws are ambivalent to the specific needs of farming in urban areas and require revision. For example, the livestock limitation of four animals doesn’t necessarily make sense, and it has been suggested that these regulations should vary according to species type and population density. Other areas are simply not addressed by the by-laws (for example, the use of polluted river water for irrigation).
In addition to the legal ambiguity, there is a serious issue with the implementation and enforcement of the by-laws. For example, although prohibited, open grazing continues unchecked, and the City council has been lax in its enforcement. Although riparian corridors are meant to be reserved for agricultural production, encroachment by development (and subsequent erosion) remains a problem. In Temeke, sand mining has become lucrative, and mining companies are encroaching on publicly protected riparian corridors competing with other uses including agriculture. In addition to limited resources, political corruption has been a factor in consistent enforcement of by-laws, as elites are often the ones violating the by-laws.

**Institutional priorities**

The national government is ultimately responsible for ensuring adequate food security for urban households. The government is able to influence/enable urban agriculture through the coordination of a number of ministries including the Ministry of Agriculture and Livestock (recently reorganized as the Ministry of Agriculture and Food Security and the Ministry of Livestock and Fisheries). The national government sets policies to be followed at the local level, manages and supervises local authorities, and through the donor funded Agriculture Sectoral Development Program (ASDP), makes funding available through the locally organized District Agriculture Development Project (DADP). DADP monies are the primary funding sources at the local level for supporting urban agricultural practices as well as to finance and staff district offices. DADP funding consists of a) funds for investment and project implementation (including pumps, irrigation pipes, heavy machinery, etc.), 2) capacity building funds in order to train staff and assist extension officers and 3) extension block to facilitate group trainings and workshops. Although urban agriculture received mention in the Agriculture and Livestock Policy of 1998 (Lee-Smith, 2010), it has not greatly influenced the formation of associated policy.
The Dar City Council and subsequent municipal councils are responsible for preparing by-laws to guide urban agriculture. They also enforce urban development plans and laws that impact urban agriculture as well as issues licenses and permits. Both the City and the municipal councils are in a position to make decisions (particularly those involving land) that would directly affect urban agriculture. Unfortunately, many local officials and city planners have tended to focus on development and have not prioritized the needs of agriculture.

In addition, agricultural extension is organized at the municipal level (and further organized at the division, ward, and mitaa (neighborhood) level). In 2001 the three municipalities of Dar Es Salaam counted about 200 extension workers, about half of them in urban wards. Extension agent address a number of aspects of agricultural practice including training and outreach (either onsite training or group workshops), organizing farmer/producer cooperatives, managing and distributing investment funds (for the purchase of tractors, fertilizer, seeds, animal breeds, roads), and organizing demonstration plots and model farms. However, both agricultural education and research in Tanzania has traditionally tended to focus on rural concerns and issues, and has not yet fully incorporated urban issues as part of its agenda.

The practice of urban agriculture has also been hampered by an institutional and governmental structure that prioritizes rurally based agricultural practices. These priorities exist at both the national, district, and local level and even extends to the commercial sector. For example, fertilizer and seeds are packaged in large quantities, intended for rural application. However, such quantities may be inappropriate for smaller urban plots. At the national level, the Ministry of Agriculture and Food security and the Ministry of Livestock and Fisheries and do not have special divisions or sections devoted to the promotion and regulation of urban agriculture. This affects investment and funding priorities. Much of the available funding for agriculture is
intended for distribution to villages and districts. Urbanized areas, however, are organized according to municipalities (instead of districts) and mitaas (neighborhoods). Likewise, the Ministry of Land, Housing and Urban Development (MLHUD), which works with the Municipal Councils on land planning, does not clearly state or recognize urban agriculture activities.

At the local level, a general lack of public awareness and overall antipathy exists towards the role and needs of urban agriculture. Municipal officials often do not see the value in agriculture and feel that residential or industrial development would generate more revenue, and are therefore less interested in protecting agricultural land. Subsequently, municipal officials and urban planners have continuously failed to incorporate agriculture into the planning process and agricultural extension workers have not been consulted about urban agricultural needs. The institutional arrangements and division of governmental powers have only exacerbated this problem. While the local governments are responsible for project implementation and other local decisions, including land use planning, the ministries generally serve more of a supportive role. Thus the burden of initiative to protect or promote agriculture lies with the local government, who tend to prioritize development over agriculture. Moreover, the ministries, even if asked to act in a supporting role, do not have a central policy upon which to organize and base their decisions.

Health hazards

There are a number of health and environmental related issues associated with urban agriculture (Mlozi, 1997). A recent study by researchers at Ardhi University (entitled “Characterisation and assessment of heavy metals by accumulation in water, soil, and vegetable grown in the Msimbazi river”) exposed some of the health risks posed by the consumption of urban agricultural products (in particular spinach, pumpkin leaves, Chinese cabbage amaranths,
which is very desirable as it only requires 3 weeks to harvest), due to the reliance on polluted water sources for irrigation, in particular the Msimbazi River. The discharging of chemical byproducts into the city’s creeks and valley streams (Andrews, 2008; Kalokola, 2010) has resulted in levels of heavy metals, such as lead, cadmium, copper and chromium that exceed World Health Organization standards. Long term effects include the malfunctioning of the liver and damage to the heart, kidneys, liver and nervous system. Children are particularly at risk.

In addition to direct consumption, there are a number of secondary health impacts due to the proximity of agriculture and high density residential development. These include the transmission of animal diseases from the removal of livestock waste (animal dung can be a source of tetanus), improper disposal of animal corpses, and chemical contamination from the overuse of antibiotics and pesticides. Malaria is also a concern, as vegetables and field crops can harbor mosquitoes that carry malaria. Specific crops such as tomatoes require moist environments that can potentially serve as mosquito breeding grounds.

**Urbanisation pressure**

Rapid growth and the constant development pressure on land in peri-urban areas has forced agriculture to compete for land with other urban land uses. Dreschel and Dongus (2010) have documented the changing spatial patterns of urban agriculture throughout the Dar Es Salaam metropolitan area. They found that while the overall percentage of land devoted to urban agriculture has remained approximately the same between 1992 and 2005, the spatial distribution of urban agriculture has changed dramatically, as former areas devoted to agriculture have been converted to residential or industrial uses, and new areas (particularly along rail lines and riparian corridors) have been opened up. Urban agriculture has therefore increasingly been forced on to marginalized lands and hazardous areas. Agriculture has also encroached on open
spaces and other public lands (i.e., cemeteries, playgrounds, road reserves, and utility-rights-of-ways), as laws to protect these open areas are not strongly enforced.

Despite the recognition of the contribution that urban agriculture has made both economically and nutritionally to the city, little attention has been given to allocate or retain lands for urban agricultural uses as the city expands, despite relentless pressure and land speculation. The local government does not regulate the open spaces and does not allocate land specifically for agricultural uses. For example, the municipality of Kinondoni only has 15 hectares devoted to agriculture, and this is primarily for demonstration plots. Land use conflicts between farmers and residents of newly developed residential areas are on the rise, and there are no regulations or guidelines to govern such conflicts. Political corruption, administrative bureaucracy, and a lack of transparency in land transactions hamper the efficient and orderly development of peri-urban areas. The local government has also been rather slow in providing available plots for development. For example, annual demand for building plots is over 20,000 units in Dar Es Salaam, while the annual supply of plots has been under 700, leaving nearly 97 percent of the recorded demand unallocated. The shortage of formalized plots has led households to acquire lands from the informal sector (Hoogland, 2003). A recent study found that approximately 500,000 housing units were constructed under informal tenure conditions in 2005-2006, up from 50,000 in 1972-1973 (Lugoe, 2008).

The competition over land has also spilled over into competition for other resources, in particular water. A study by Dongus et al. (2009) of 3 wards within the city found that only 30 percent of the surveyed gardens were irrigated with tap water. Slightly more than half the surveyed gardens were not irrigated, or relied on rainfall or open wells for water. These tended to be located in informal settlements. The Dar es Salaam Water and Sewage Authority (DAWASA)
has exacerbated this situation by charging high rates for water usage. DAWASA has threatened and even discontinued water pipes for urban farmers (Sawio, 1998).

**Ambiguous and insecure tenure arrangements**

Tenure insecurity in rapidly urbanizing peri-urban areas is a persistent characteristic of cities in sub-Saharan Africa. A lack of secure land rights has resulted in land grabs (some by foreigners), property disputes, uncontrolled urbanisation, and disinvestments. In addition, legal disputes over property are common, increasing costs of ownership and delaying potential improvements in the property. By some estimates, up to 70% of development in Tanzania occurs under informal tenure conditions.

Because of the many problems posed by insecure land tenure arrangements, the government has taken some measure to ‘formalize’ customary land tenure. The Land Act of 1999 and the Village Land Act of May 2001 integrated customary law into the legal system. Accordingly, all land in Tanzania was classified as village land (roughly 70% of the country), reserve land (e.g. national parks), and general land, which include most of the urban areas (Mihoefer, 2008). The Property and Business Formalization Program, based on the ideas of Peruvian economist Hernando De Soto, seeks to formalize informal tenure arrangements through surveying and assigning renewable owner titles. However, such attempts at ‘formalizing’ customary land tenure are often problematic. The formal land tenure systems can be in direct conflict with pre-existing local practices, and the formalisation process itself ends up fueling conflicts between peoples by emphasizing differences (Benjaminsen and Lund, 2002). In addition, administrative and institutional obstacles exist. Most formal processes involve expensive and complicated processes of arranging title deeds that are beyond the reach of the poor. Attempts at formalizing customary or insecure land tenure are often held up by red tape,
and fall short of meeting demand for such services, due to the time and bureaucracy involved in plan preparation, approval, and land registration. In fact, as formalisation usurps customary arrangements, many are likely to lose their land. In addition, technological and institutional constraints exist as well. In Tanzania, the land registry is not computerized and is reliant on outdated procedures for gathering information and registering rights. Land and title records are kept in paper files maintained by six independent regional divisions (Mihofer, 2008). Because of these obstacles, only 11% of the possible properties have been registered in Tanzania, and the existing cadastral map is sporadic and haphazard (DeSoto, 2006).

As such, urban farmers are largely dependent on holders of open space - schools, institutions, and private actors, for land. Much urban agriculture is produced in open spaces without secure land rights, increasing the perception of urban agriculture as a marginal or transitional activity. Farming occurs either without agreement through the illegal encroachment of public lands including parks, nature reserves, and cemeteries; or through informal tenure arrangements with private actors, which operate under unwritten norms and informal agreements (Magigi, 2008). For example, the Tazara farmers in Ilala have had a verbal agreement with the Tazara Railroad company since the 1980s, and cultivate plots adjacent to the rail lines. In this case the relationship is symbiotic, as the farmers cleared an area of brush the railway had security concerns about.

Rent is generally not paid to the owners, as the tenants will probably have to move within a couple years when the owner decides to develop or sell their land. Producers are stipulated not to make investments in the land (e.g. trees), in order not to make their stay permanent. Unless a farmer owns the land, he is unlikely to dig new wells or make other improvements, such as irrigation, thereby only exacerbating some of the public health issues
discussed earlier. Open spaces are not registered and producers have no rights in case of expropriation. The eviction of urban agriculturalists is common practice in Dar es Salaam, something that often happens without protest.

Producers have formed cooperatives to help assert their rights and organize around securing land rights, assisted to a certain extent by aid organizations and NGOs, but these have been only somewhat effective. Such organizations are essential in mobilizing farmers, providing assistance, securing resources, providing input and local knowledge, and even participating in urban agriculture campaigns. Generally urban farmer groups and cooperatives are organized around either securing common resources (power tillers, etc.), serving as savings and loan organizations, or assisting in food processing. Nevertheless, forming and maintaining such groups in urbanized areas is difficult as the nature of urban agriculture presents special challenges. First, farmers tend to be spatially fragmented, working smaller, more isolated plots than their rural counterparts. Second, they tend not to own their plots, and their tenure is often temporary, dependent on the landowner. Third, the stratification of urban farmers according to income and socio-economic status implies that needs vary greatly and it is difficult to organize around a common purpose. The difficulty in organizing urban farmers is exemplified by the legacy of the Urban Vegetable Promotion Project (UVPP), an initiative of the Deutche Gesellschaft fuer Technische Zusammenarbeit (GTZ) in the 1990s to support urban agriculture by utilizing existing institutions. Local extension officers were trained in technical and organisational skills, and farmers were organised into groups. However, once the project ended in 2001, many of the groups that had been started found it difficult to sustain themselves, and the local district councils were hard pressed to support ongoing extension activities.
Conclusions

As urban agriculture is likely to remain an integral component of urban life in Dar Es Salaam, it needs to be recognized as integral part of the social, economic, and dietary life of urban residents. Addressing the myriad of issues facing urban agriculture in Dar Es Salaam will involve a mixture of institutional reform and an active involvement on the part of both the local and national government.

National Government

Institutional reform: At the national level, a National Policy concerning urban agriculture could be formulated so that the various Ministries involved – Land, Agriculture, Livestock - can better coordinate their activities, and have a mutually recognized common reference point to formulate relevant policies. These policies could then be translated into regulations and guidelines to guide both ministerial and local action.

Furthermore, institutional reform is necessary to promote and advocate for urban agriculture. Currently, the Ministry of Agriculture is primarily concerned with rural agriculture needs and is unable (or unwilling) to focus the special needs and circumstances of urban agriculture. As such, the Ministry of Agriculture could be reorganized to include a Department solely concerned with urban agricultural issues. In addition, greater interagency coordination is required among all agencies and ministries whose decisions affect urban agricultural production. This could require coordinating efforts between the Ministries of health, lands, housing, and urban planning, the Dar City Council and the National Environmental Management Council. In this way, the central government could better assess short and long term effects on environment and public health, and make this information publicly available.
**Investment:** The private sector, in particular hotels, serve as potential large scale institutional consumers of urban agricultural products. However, marketing urban agriculture products to such institutions remains difficult due to limited and variable supply and ongoing public concerns over quality (Sawio, 1998). Improvements in the production of urban agriculture will require investment into appropriate infrastructure to support urban agricultural activities. In particular, in order to reduce post-harvest loss of perishable foods like tomatoes, facilities necessary for processing, storing, distributing, and marketing the products of urban agriculture is necessary. Such investments could include warehouses, storage facilities, abattoirs, and fixed markets, but also the inputs required for farming, such as seeds and pesticides, in quantities conducive to urban needs.

**Information dissemination:** The national government can also serve a vital information and awareness role. It could raise the awareness of ministries and government officials to the benefit and importance of urban agriculture through workshops and seminars. Special attention could be focused on urban agriculture's impact on income generation and urban household food security and nutrition. The government could support research on health issues involved with urban agriculture and make this information publicly available. The government could also advocate the use of appropriate technology in dealing with these issues, whether water distribution systems or better seed varieties.

**Local Government**

As land use decision making is primarily a function of local government, the municipal councils could better incorporate urban agriculture activities into the planning and regulatory process and provide incentives to ensure that agriculture is recognized as a major activity in urban and peri-urban areas.
**Planning:** Urban agriculture should be fully incorporated into the planning process, and urban agriculture should be integrated with other urban activities and processes, in particular solid waste and wastewater management. As the city expands, public lands could be set aside for use as urban agriculture. This will allow public ownership of land dedicated to agriculture and will offer the opportunity to address public health concerns and quality control of production more easily, for example, through the establishment of a secure water source.

**Regulation:** In terms of regulation, existing by-laws regulating agricultural activities must be reformed to better reflect actual farming practices. Those that allow or prohibit any urban agriculture activity must be clearly written and explained. Changes to the by-laws could include variations such as limits on livestock based on density and species type as well elaboration of by-laws addressing public health concerns. Furthermore, by-laws must be uniformly enforced if they are to be effective, and should be adequately explained to farmers.

Land tenure is a primary detriment to a better functioning urban agricultural market. As such, municipal governments could coordinate efforts to ensure adequate property rights and ownership of land by formalizing informal tenure arrangements and reducing the bureaucracy to create land titles. Short of this, local government should acknowledge that much urban agriculture occurs under transitional conditions (prior to urban development) through informal arrangements. These arrangements could be supported through incentives provided by the local governments (for example by decreasing taxes on owners who allow farming). The rights of producers and protection from expropriation could be integrated into the system of by-laws that regulate agricultural activity. In order to better integrate, manage, and formalize agricultural activities into the normal economic life of the city, agricultural activities could be taxed to
legitimize the activity and raise its profile (and overcome biases) by city managers and public officials.

Incentives: Local governments could encourage and support the formation of farmers groups and cooperatives organized around common interest needs. This could involve providing legal assistance and protection, training on specific topics of interest (e.g. pesticide application), and providing meeting spaces, supplies, and making credit available in the form of low interest loans to such groups to purchase necessary equipment. The government could emphasize and develop extension knowledge and training specific to the needs of urban agriculture. For example, certain breeds and species can prove more effective given the limited space of urban environments. Additional areas of research to be considered include a market analysis of urban agricultural products, as well as the extent, scale, nutritional, economic and environmental impacts of urban agriculture.

References


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