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ENVIRONMENTAL PERSPECTIVE OF URBAN AGRICULTURE IN DEBRE MARKOS TOWN, AMHARA REGIONAL STATE, ETHIOPIA

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ABSTRACT: *Urban agriculture plays great role in environmental benefits to urban farmers in particular and urban dwellers at large to grasp the significance of the sector towards urban environments. It also contributes challenges to the environment unless urban farmers take care of farming practices. So, the study focused on identifying the major types of UA in Debre Markos Town, identifying stakeholders involved in urban agriculture, challenges of urban agriculture to the environment and environmental benefits of urban agriculture. Basically the study employed a descriptive research type. Both qualitative and quantitative approaches were used. And 152 samples were systematically selected from individual farmers, micro and small enterprise under urban agriculture, and investors. Eight officials were selected through purposive sampling from relevant governmental organizations. Empirical data was collected through structured questionnaire, interview guiding questions, focus group discussion, and on spot observation. The data gathered via the aforementioned techniques were analyzed and the findings were presented using tables, charts, and plates. Accordingly, the findings revealed that animal husbandry is the most common urban agricultural activity in Debre Markos Town following green biodiversity enrichment. In addition, though the multi-stakeholders are participating in urban agriculture, their environmental concern was very low. It is evident that 55.9% of challenges of urban agriculture to the environment are waste dumping, soil loss and loss of biodiversity due to ignorance of environmental attention while farming in the town. From the study, it is concluded that composting of both municipal and household waste for urban agriculture is a neglected activity which would have been used for augmenting of soil fertility instead of polluting the urban environment. It also recommends that awareness creation; spur on institutional support with special attention to the environment and rendering technical extension service as it has been case for rural areas to solve negative environmental outlooks and practices of urban farmers should be strengthened.*

KEYWORDS: Urban Agriculture, Urban Farmer, Environmental Challenge, Environmental Benefit, Ethiopia

INTRODUCTION

Urban agriculture is not a novel phenomenon; it is likely as old as the earliest urban settlement. Throughout the globe, agriculture today is increasingly, a part of city landscape. Like many urban trend, agriculture crosses borders north and south and is evidence in both rich and poor countries. It is found in small towns and the major metropolis, in temperate and tropical latitudes, and at sea level and high in the mountains (Bourque 2000). In 1996, the United Nations Development Programme (UNDP) estimates that about 800 million urban residents are involved in commercial and subsistence agriculture in or around cities (UNDP 1996 & Smite et al, 1996).

Urban agriculture in the developed countries play great role, for instance Mexico city`s New urban production systems, such as the Chinampa system (which is considered more diverse)

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and the terraced (*n+opal* vegetable) and *tuna* (Teotihuacan) production systems are well adapted to the urban environment. They make optimal use of local inputs; they use local wastes as a source of nutrients and are interlinked. Like any production system, these systems need proper management (especially in the dairy systems the odor produced and the presence of flies need to be controlled), but they pose relatively little danger to the urban environment (Losada et al, 2010).

Most African cities face significant urbanization-related challenges, such as waste management and drinking water supply; however, it is not surprising that urban agriculture in general does not get much political attention. As reported from southern, eastern and western Africa, it is usually ignored or tolerated without any significant restriction or support. In municipal planning, it is usually missing from the agenda (Drechsel, Cofie & Niang (2008).

The situation was not different in Ethiopia. Lee (1997) and Egziabher (1994) stated that the livelihoods of many urban citizens in Ethiopia (e.g. Addis Ababa: economic capital and which accounts for over thirty percent of the total urban population) is heavily dependent on urban farming, but urban policy makers fail to give due attention to urban agriculture during urban planning policy reforms. But according to (Edwards, 2010) as is the case in Ethiopia, urban agriculture can be characterized in to three farming systems on the basis of location. These are the peri-urban, household or homestead gardening, and vacant-space cultivation. The peri-urban cultivation takes place on lands just outside the built up areas of the city. Vacant-space cultivation is done in open spaces usually in residential areas, beside water ways (natural and man-made such as drainage channels), and road sides.

Kasumba's study (2007), analyzed urban agriculture from a 'sustainable development' perspective and considered four major aspects: food security, the contribution of urban agriculture to the cultivating household, the environmental benefits of the practice, and associated social and psychological benefits.

Urban agriculture today is increasing all over the world including Ethiopia. Its focus is on poverty alleviation. Urban agriculture from the sustainable development perspective is considered in to four major aspects; food security, the contribution of urban agriculture to the cultivating household, the environmental benefits of the practice and associated social and psychological benefits. Furthermore, environmental benefits were extremely modest (ibid). The attention given for environmental perspective of urban agriculture in the study area is very minimal.

Urban agriculture in Ethiopia is traditional practice, and the urban-based population does keep cattle, and chicken, sheep, or growing rain-fed crops and vegetables, on the plots adjacent to their houses (Gittleman, 2009). In addition to its benefits for the production of foods from vegetables, crops and rearing animals, urban agriculture has socio-economic and environmental benefits. For instance, UA in Addis Ababa create large number of employment and source of income for the city residents.

People tend to think that urban agriculture is messy business and have little understanding of environmental benefits of the urban agriculture and people need food production (Robeta, 2011). Urban agriculture in Debre Markos town is practiced by few individuals before a decade at the home garden. But when the urban dwellers and unemployment is coming to increase from time to time UA has become job opportunity for unemployed, investors and enterprises. Technique vocation and enterprises development office established urban agriculture as one

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package for organized groups as a means of job creating and income generating activities. Here, the urban farmers aren`t given attention to environmental perspectives. Most urban farmers in the town are technique vocation and enterprises, investors and individual farmers. Their engagement is only to have economic benefits leaving aside environmental perspectives. According to Debre Makos Town urban agriculture office and technique vocation and enterprises development office mid-term report (2012), the urban farmers currently engaged in agriculture are 1516 urban farmers. This has lead to generation of solid wastes and waste water which in turn has become costly to the city administration, yet they do not currently have the capacity to service the whole city as a result of which solid wastes are dumped openly as the study conducted in Ethiopia towns such as Bahirdar, Mekelle, Hawassa (UNDP; 2004). Therefore due to these there is environmental degradation and pollution which is caused from urban agriculture indicated by soil loss, bad smell, and biodiversity loss. So, it is the concern of this study to assess environmental perspectives of urban agriculture at the legal jurisdiction (boundary) of Debre Markos town in the Amahara regional state.

MATERIALS AND METHODS

Study Area

Location: Debre Markos, the capital of Misrak Gojjam Administrative Zone is located in the north west of the capital city of the FDRE of Ethiopia, Addis Ababa at a distance of 300 Kms and 265 Kms to the capital of Amhara Nation Regional State, Bahir Dar. Specifically it is located in the Amhara regional state, East Gojjam zone. The town served as the capital city of Misrak Gojjam zone. Until 1995, Debre Markos was the capital city of the province of Gojjam. It has latitude and longitude of $10^0$20'N, $37^0$43'E and altitude of 2,446 meters above sea level and it has moderate temperature (The Enlightenment, 2009). The town is named Debre Markos after its principal church, which was constructed 1869 and is devoted to Saint Mark.

Area/size: The area of Debre Markos Town is 6,160 ha and has oval shape; its Average Annual Temperature is 18.5ºC; Mean Annual Rainfall is 1,380 mm and the existing wind direction is from north to south. The main natural constraints for the physical expansion of the Debre Markos town are hills, swamps, rivers and forests; while the manmade constraints are illegal settlements and urban rural boundary conflicts.

Population: According to CSA (2007), the population of the town was 62,497. Out of this 29,921 (47.87%) were males and 32,576 (52.1%) were females; 16,325 (26.14%) were within the age group of 0-15 years, 42,185 (67.49%) 16-60 years, and 3,987 (6.37%) 61 years and above. The population growth rate at low variant was 2.4%, while household size in the town is calculated to be 3.2. The majority of the urbanites worshiped Ethiopian Orthodox Tewahido church. 97% of the inhabitants are speakers of Amharic language. The remaining 3% of the inhabitants are speakers of Tigiregna, Agew and Afan Oromo. According to CSA (2013), the population projection figure of the town had been estimated 38291 male and 41689 female inhabitants which is a total of 79980 populations. Area of the town is expected to be 1214.9 sq. Km and 65.82 km/square density.

Research Design

The study employed both probability and non-probability sampling technique: For the assessment of environmental perspective of urban agriculture in Debre Markos Town, a well-

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structured questionnaire with both open and close-ended questions was prepared. The questionnaires were prepared in English and then translated to Amharic language to ensure good understanding of the respondents. Debre Maros Town was purposively selected because it holds urban farmers in the town and knowing that only few researches are done so far in this issue. Interviewees were also selected purposively from relevant governmental organizations in order to obtain reliable data and focus group discussion was selected by stratified technique to get data from different group of community.

Finally questionnaires were administered to the selected urban farmers from each three categories of urban farmers. To pick representative urban farmers from the 3 categories systematic sampling based on the prepared document list by the urban agriculture and environmental protection and land management and use office, technique vocation and enterprise office and town municipality office. The list of urban farmers for each category was marked in order of their serial number like 01, 02, 03 and so on. Hence, the said document list was used for picking the representative farmers. The total number of urban farmers in each category was 4, 8 and140 sampled from investment, micro and small enterprise and individual farmers respectively. A total of 152 urban farmers were systematically selected for the distribution of the questionnaire. Besides to questionnaire, interviews and focus group discussions were conducted with relevant institutions and groups in Debre Markos Town since they were participated directly and indirectly in urban agriculture in their daily activities; and field observation helps to grasp what was really happening on the field.

RESULTS AND DISCUSSIONS

This chapter presents the results of the study conducted on the environmental perspectives of urban agriculture in Debre Markos Town. The result emphasizes on the information demographic or socio-economic characteristics of respondents`, major types of urban agriculture in the study area, stakeholder involvement to the urban agriculture, the challenges of urban agriculture to the environment in the study area and the benefits of urban agriculture to the environment.

Types of Urban Agriculture

Livestock keeping is widely practiced in the town of Debre Markos. There are both small and medium scale agricultural practices in the town. The small scale farming are done by small holder urban farmers for subsistence living. These activities include livestock keepers in the town usually let their animals roar freely, particularly during the winter season eating grass, crop residues in the field or whatever they can find. Cattle fattening and milk production were the most common livestock, though sheep, pig, poultry were fairly numerous in the towns under study. There were also a small number of horses and mules used for cart traction purpose in the town. A small variety of vegetables were identified in Debre Markos Town. These vegetables are mainly found in the stream bank and backyard, and other similar sites. There are also medium capital intensive agricultural practices in the town; like dairy production, cattle fattening, and poultry farm and other agricultural investments. Even though, there are legal agricultural investments there in the study area no large scale agricultural practices are promoted in the town. The area is suitable for agricultural investments.

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The study result indicates that 27.6 percent (42) of urban agriculture is conducted in the intra-urban and 72.4 percent (110) in the peri-urban area within the boundary of town; similar study was conducted by (Cofie, 2009; Mougeot, 2000). In general types of urban agricultural practices are animal husbandry, crop production, mixed farming and forest development in the terrestrial land unlike (Smit, 1994) that he grouped in to Aquatic, horticulture , livestock, agro-forestry , and others (snail raising, ornamental fish, silkworm, worm larvae, horses, pets, and medicinal and culinary herbs).

Stakeholders Involvement in Urban Agriculture

Urban agriculture is practiced along with various stakeholder involvements, that in Debre Markos town urban agriculture best integrates more with private or limited companies and publics. The study result in Debre Markos town shows that stakeholders involved in urban agriculture are traders, local communities, ACSI, cooperatives, companies like Ambasel, and government organizations. Here, in contrasts to FAO, (2012), non-government organization involvement with urban agriculture in the town currently is negligible. Even though, Mougeot, (2000) stated that many stakeholders are involved in UA; such as, the suppliers of resources, inputs and services and the producers, the processors and the transporters, retailers and the consumers, the promoters and the managers. These actors are relevant to the public and private sectors. The study result revealed that though government is involved in urban agriculture, only 18.42 % urban farmers get full support of government. Urban agriculture is being practiced as an informal sector and has little support from local councils (Bryceson, 2005 and Bryld, 2003).

Challenges of Urban Agriculture to the Environment

A number of challenges were identified of which 55.9 percent of respondents explained that soil loss, waste, and biodiversity degradation as to be major environmental challenges that pollute the local environment as a result of UA in the area which hinders the development of environmental friendly UA in the town under study. Some of the reasons are absence of land ownership, access to land, lack of training, shortage of farm land and lack of institutional support. The other constraint that is relatively as important as land issue was the lack of credit or financing opportunities for farmers, lack of improved plant and animal species, scarcity of water and waste disposal were the significant problem of urban agricultural development in the town under study. The identification of those great problems might to generalize and interpret as a general perception that farmers need greater support and assistance from town administration to halt the challenges and play their own role in the local environment as well as country ecology and economy.

The study identified a number of challenges that were facing the urban farmers in the study town. In general, the constraints were classified in to three broad categories, namely, institutional support, financial and capacity related challenges.

Both small scale and medium scale urban farming exists in the town under study, the micro-scale farming has lesser environmental damaging effect compared to the medium one. During the field observation urban farmers practicing micro-scale farming dumped agricultural wastes on the road side, cultivating stream banks that accelerate soil erosion, high compaction of soil by large animals at the vicinity of livestock rearing areas are the major disadvantages caused by this farming; similarly Veehuizen (2006) argued that poor hygiene and a lot of direct contact between animals and people can have the same high risks. Key informant from health office expert has explained there are respiratory diseases caused from bad odor from urban

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agriculture. The risks that may be associated with the improper dumping of wastes from urban agriculture practices must be recognized. If not properly managed it may also have negative environmental impacts such as noise, dust, odors, pollution of water bodies. Cultivated areas and livestock in the towns may attract or provide breeding ground for rodents and flies and thus can contribute to the spreads of diseases they may carry if proper precautions are not taken. UA may contaminate local water sources if high input levels of fertilizers and pesticides are used. Neighbors may complain have the dust, smell and noise created by urban farms (Graham et al, 2002).

The use of agrochemical to our farm is minimal due to the reason that the occurrence of pest and disease is relatively low in the study area. Even if few diseases are being occurred the area we cultivate is small that everyone can control culturally, in addition, the availability of pesticide and herbicide in little volume for smaller area is not available in the market. On the way so far it becomes conducive for our environment, so that application of agrochemical in the farm area so as to boost production is very negligible in the study area.

Shortage of space

As many scholars already studied that urbanization is rapidly increasing from year to year. As a result space for urban agriculture is becoming in shortage. So, it leads to farm on a limited land above its carrying capacity. In case, it resulted in over grazing for free grazing animals, soil erosion due to storm water runoff, stream bank cultivation. Free grazing devastates grasses, forage trees and micro organism under it. Birds dwelling on the tree would also migrate. As a result biodiversity also declines due to such degradations of the environment in town under study. The study showed that 84.9 percent respondents have faced shortage of space. Similar concepts are also explained by (Bryld, 2003 and Argentina, 2000).

Environmental Benefits of Urban Agriculture

The study found that unknowingly urban farmers agreed on the benefits that UA could deliver to them that 42.1 percent of them revealed as it reduces urban heat, 2.6 percent of the respondent waste recycling or reuse, 12.2 percent as it reduce soil erosion/degradation, 36.2 percent for green biodiversity enrichment, 0.7 percent increase water availability and 2 percent reduction of storm water runoff and the rest for other benefits. The study also showed not only the above benefits but also it delivers health benefit that from all respondents 94.3 percent revealed on health benefits and the rest disagreed in comparative preference to challenges. In the same way Magigi (2013), argued that urban agriculture contributes to nutrition and environmental benefits besides to economic and social benefits. Debre Markos Town has favorable climatic condition for urban agriculture such as fertile soil, and optimum rain fall; due to these the areas were green throughout the year. The study established that, urban agriculture is part of the urban green that improves the urban micro-climate, increase green-biodiversity, green trees and vegetables clean the air by trapping air dust; reduce soil erosion, as well as the aesthetics and recreational functions of urban areas. It also preserves the viability of ecosystems and reduces the loss of biodiversity. Some non- farmers added that urban agriculture had protected their areas from being used as sites for the haphazard and unhygienic dumping of wastes during group discussion with them. Similar study result was concluded by (Heather, 2012) as:

> U*rban agriculture is a positive use of unused, vacant lots and impermeable urban roofs, which can provide a number of benefits. In a city like Philadelphia, which is*

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moderately densely populated, utilizing these spaces for UA, in combination with the addition of other types of green spaces, offers the most potential for improvement of the urban environment in terms of storm water, air quality improvement and reduction of the urban heat island effect, increased biodiversity, waste reduction, and decreased carbon emissions resulting from the transition of a portion of the food supply to locally grown food.

The Role of Urban agriculture in Solid Waste Management

Municipal waste is not problem rather it can be used for agriculture as natural fertilizer and waste of food can also be used for swine feed. Municipal waste in Debre Markos Town is least important that 14 m^3 municipal wastes are openly dumped every day. 35.66 percent of the total respondents` farm needs compost as natural fertilizer. But only 14.1 percent of them apply compost for their farm. Urban dwellers explained as **"*waste is waste*"** as to traditional perspective. Then, the environmental perspective of solid waste can be challenging assumption. At the current case solid waste in Debre Markos Town causes environmental problem both at the dumping site and at the area where it was generated. It contradicts with (Losada et al, 2010), Local food production in Mexico City turns wastes into resources. Compostable organic wastes, which can be used as a soil amendment, account for 25 to 40 percent of municipal waste streams, and often end up emitting methane from landfills. But this study agrees with the study conducted in Ethiopia by UNDP in 2004 showed that Bahirdar, Mekele, Adama and Hawassa municipal city collected and dumped openly is 46, 48, 54 and 50 percent of the solid waste respectively.

In Addis Ababa, 70-75 percent of the organic decomposable waste, that can be used for making compost, being taken to the land fill/dump site according to (Edwards, 2010). The study found that developing country town environmental activity concerning waste management is still minimal. Besides to these, urban agriculture can help to solve waste disposal. An estimated 10% of the world population eats food produced on waste water (Smit and Nasr 1992). But the study investigated that out of all farmers engaged in cultivation of crops 14.1% of the utilized organic compost for their farms. The activities of urban farmers are vital to keep the town clean and benefit the micro environment by recycling plant nutrients. Regarding compost making the urban farmers raised lack skill and knowledge for preparation of compost and lack of appropriate site of composting is a great challenge to their activity.

Biodiversity Enrichment

The study result on table 4.11 showed that 36.2 percent of the respondents revealed that biodiversity enrichment especially green biodiversity is environmentally valuable in case of urban heat reduction, reduction of soil erosion, shade effect and food for human as well as animals. And the home campus plantation is a usual practice. The study area cultivate tree planting for the purpose of economic benefit, parking raising seedlings and for environmental benefits like shading, beautifying. Even non- farming dwellers would grow green plant for the same purpose. The observation assured that majority of each individual household planted peach tree in their compound. It has both environmental and social significance in the town. It is a good culture developing green plant in the home compound. This plantation could have the chance to harbor birds and microorganism under the shade. As a result the town would have biodiversity enrichment opportunity. Veenhuizen (2010) on his study found that UA and forestry can have a positive impact up on greening the city the improvement of the urban micro-climate and maintenance of biodiversity as well as the reduction of ecological foot print of the

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city. Then, the tradition of planting tree and fruits at every individual home compound in Debre Markos Town contributes to green biodiversity enrichment.

Policy Issue Concerning to Environment and Urban Agriculture

Agricultural policy of Ethiopia is mostly rural based favoring rural farmers through extension service, credit, input supply and distribution and land certification system. UA lacks policy makers' support and attention in Ethiopia beyond strategies designed for micro and small enterprise and investment. Individual urban farmers have no clear policy issue. Because, it is the fact that majority of the population is living in rural area and their livelihood is dependent on agricultural activities. Whereas, in urban area, urban agriculture is the source of food, incomes generating and environmental benefit, for a lot of Debre Markos Town dwellers. Therefore, UA needs implementation of UA plan in the town.

Challenges of UA can be prevented and managed by appropriate urban policy, including provision of adequate extension service to urban farmers. Regulations are needed to control which crop and practices are grown and performed where and which farming methods are employed. Local administrations of the town tend to think that urban food production is a messy business and have little understanding of people need to food production in town. It indicates that extension service and follow up of urban farmers is necessitating in urban area as that of rural area.

The constitution of the Federal Democratic Republic of Ethiopia, Proclamation No. 1/1995, contains provisions, which recognize the importance of the environment protection and the need for its proper management. These provisions are the major springboard for subsequent legislations in the environmental management, as well as for mainstreaming environmental sustainability in the political, social and economic development sectors.

Two declarations on urban agriculture; Quito, (2000), Addis Ababa (2002) focused on environmental, social and economical conditions of UA. Ethiopia has ratified the Addis Ababa declaration by affirming "We the ministers, mayors, city managers, representatives of the governments, provide an enabling environment for sustainable livelihoods in our cities; review and revise laws, by-laws and regulations to promote effective food supply and distribution activities; monitor environmental and health risks related to food production, marketing and processing and take appropriate action to reduce them". However it is still not practical rather being a shelf talker.

Recommendations to Improve Negative Perspectives of Urban Agriculture to the Environment

Based on findings valuable recommendations can be drawn from the study results so that urban agriculture could play its optimum role in built environment, creating a more food secure, and green, attractive and build positive attitude of urban agriculture towards environmental outlook in the town of Debre Markos. The following suggestions are made to improve negative environmental perspectives of urban agriculture:

- The urban Agriculture and Environmental Office of the Town should deliver extension services for urban farmers in regard to environmental protection with special attention to the intra-urban and peri-urban farming activities.

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- The office should integrate with relevant stakeholders like environmental department and town municipality. The town also should attract NGOs participating in urban agriculture.

- Urban environment seems to have been one of the most neglected sectors in the town nowadays in the sense that there is no concerned autonomous governmental organ that has been working towards the development of the sector. The town administration should have to establish environmental sector with expanded responsibilities and duties so as to coordinate the efforts of supportive agencies, as well as to provide the requisite training and extension services to the urban farmers and dwellers (community as a whole)

- The study recommends that Debre Markos Town is a labor-rich but capital-poor town of the Amhara regional state; urban agriculture should be encouraged, strengthened and given recognition in urban planning and development.

- Debre Markos Town local Administration should seriously embrace urban agriculture as a viable sector that could contribute to sustainable, employment creation, food security and poverty alleviation of the urban dwellers, pristine environment. Therefore, it is better to identify and establish the specialized intensive agriculture production zones such as urban dairy zones, vegetable zones along streams, fattening zones, green recreation zones and poultry zones may result in a more productive and environmentally friendly urban agriculture in the town.

- Urban farmers have to adopt modern technologies like stall feeding, drip irrigation to save scare water, inter cropping to get maximum return per unit area and lessen risk of crop failure and planting multi-purpose tree species to generate income and to enhance urban environment as agro forestry in their plots.

- Providing effective capacity building program for the farmers on a continuous basis, through training; work shop, conference, field demonstration, and experience sharing particularly on basic principles of animal husbandry, agronomic management practices, compost making, soil conservation, safe and optimum use of agrochemicals, and mitigation measures of untreated waste water for irrigation.

- Debre Markos Town Administration should focus on environmental education program so as to make urban farmers and urban dwellers aware of environment and related issues, to enable farming participants solve environmental problems, to motivate farming participants and UA stakeholders in environmental conservation and sustainable development in the sector.

- Waste composting has to be the integral component of waste management of the town to reduce cost of disposal and to build pristine environment. Urban organic waste has to be considered as useful resource rather than expelling as useless garbage. There is no doubt that government support for urban agriculture development is crucial, in marketing infrastructures development for inputs and outputs, and credit provision are one of the critical factors in the improvement of such productivity and in the successful development of agriculture. Therefore, government has to develop market infrastructures and establish a special credit by negotiating with international

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organizations working in urban agriculture to lower the collateral requirements and low interest rate of credit for urban farmers.

- Then all urban government structures should have to build environmental integration forum and integrated implementation schemes by promoting positive environmental performance and minimizing negative performance and attitudes towards urban dwellers and other concerned bodies.

- It is clear that urban agriculture exhibits both environmental challenges and benefits. The country has no policy concerning urban agriculture though it contributes social, economical and environmental advantages to urbanites. So, policy makers have to think over this issue. And the lax enforcement of proclamation act which is related to urban agriculture triggered challenges should be ceased; and relevant regulations and proclamations such as pollution act and environmental act should be enforced by urban administration.

SUMMARY AND CONCLUSION

The research results of the study tell that urban agriculture could play a great role in the overall development of the town if the office managers, practitioners and the urbanites at large are well aware of the role, practices and peculiarities of the sector. A number of urban agricultural activities were practices from micro scale to medium scale enterprises in the town. The micro-level are the cultivations of vegetables, poultry husbandry, dairy cow keeping, pig production, bee keeping are the visible ones. Tree seedling production is also conducted by very few individuals. The medium scale agricultural activities are milk production and cattle fattening are practiced in the town under study.

The study clearly showed that the contribution of urban agriculture is multifarious, urban agriculture is one of the important sectors in urban environment stabilization through the absorption of the physical environment nuisance, particularly by recycling solid waste and used water, poverty alleviation and food security attainment. Similarly, the study showed that urban agriculture in the town of Debre Markos is found to have great importance in urban greening, fight against poverty through the supply of food products to the poor populations, food security attainment and job creation. Urban agriculture also helps to curb social exclusion through the professional reintegration of the underprivileged categories: women, youths, unemployed, and few migrant`s population from rural area.

The adverse effect caused by micro-scale urban agriculture in the town under study is not as such magnified. The problems that were caused by small scale once are dumping of waste near road side, soil erosion and little application of agro-chemicals. The use of agrochemicals in the town under the study for urban farming does exist but so far seems more limited than often alleged. But there are also health and environmental risks associated with the medium scale farms. Some of them are respiratory disease like asthma and common cold that caused health problem on workers and neighborhoods.

Urban farmers do not enjoy the same support from the governments as do their rural counterparts and has not be given its rightful place in the economy. It has been constrained with lack of appropriate technical supports, training, modern farm inputs, extension and veterinary services as well inadequate awareness among the executives and the practitioners

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themselves as to what the role and basic peculiarities of urban agriculture is. Also, credit facilities for urban farming, including other inputs, are not yet available hence the investments in urban agriculture remain low.

In recent years Debre Markos Town becomes one of new destinations of agricultural investment in the town. The investment enterprises have been hailed in town as a creator of jobs, income and even satisfying needs of animal by-products like milk and meat. Adhering to the precautionary principle of minimizing and where possible ceasing over grazing, biological materials or waste dumping from urban farming that could be harmful, and to disallow the discharge of liquid waste when they are likely to be hazardous. And also when a compromise between short-term economic growth and long-term environmental protection is necessary, then development activities shall minimize degrading and polluting impacts on ecological and life support systems.

The practice of farming in town faces both careless and deliberately imposed constraints, specially related to land. In Debre Markos Town urban farmers tend to be opportunistic, and find ways to use the smallest plots or strips of land and water in creative ways. This leads to farming on land originally set aside for other purposes (e.g., open spaces, road verges, green areas), or lands that are hazardous and therefore undevelopable(e.g., stream banks, steep slopes, flood-prone, erosion-prone), or lands that have been abandoned or contaminated by past uses by dumping waste, sometimes without the farmer being aware of the hazard. Such opportunistic use of land can undermine community planning and lead to conflicts between competing users, environmental degradation, and unregulated production and processing that may be hazardous to consumers.

The majority of urbanites have wide homestead campus there tend to garden is very low. Despite this the total production of urban agriculture reduces transportation emission from rural to urban (carbon emission).

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