The Roles of Stakeholders Participation In Sustainable Urban Agriculture and Land Use System in Urban and Peri-Urban Areas of addis ababa, ethiopia

BY ABRAHAM ASSEFA TUJI

Declaration

I, Abraham Assefa Tuji, do hereby declare the originality of my work, and whole-heartedly acknowledge the use of all materials other than my own work. This work has not been submitted to any other university than the two partner Institutions, Isara-Lyon- France and Norwegian University of Life Sciences (UMB), for any type of academic degree or publication.

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Abstract

Urban Agriculture (UA) has the potential for achieving, food sovereignty, food security, and increased quality of life for many people in Addis Ababa. However, urban farming is faced with many barriers such as lack of access to land, input and extension services that make it less productive. Moreover, Stakeholders have different perceptions and priorities for UA. The objective of this study was therefore, initiated to understand the problematic situations by analyzing and evaluating of the positions, interests, alliances, interactions and power relationships among key stakeholders, thereby, to understand their influences on UA and food systems in the study area. Data were collected using two open ended questionnaires. One was used to characterize the farming system together with selected district farmers, farmers' cooperatives, and SMEs; the other was used for selected stakeholders' analysis within the city. This study used five of the seven steps in SSM. Accordingly, step one and two would help to understand the problematic situations and expressing it with the help of a drawing a rich picture and SWOT analysis; step three and four would help in thinking about systems which may be used in the situation, including identifying root definitions and creating conceptual models of the system, whereas in step five the conceptual model was compared with the real world situations. Within the SSM framework, Stakeholders analysis and forcefield analysis were used as a major tools. From Stakeholders analysis, four main results were obtained, namely: identifying most important stakeholders; the stakeholders' knowledge level; the stakeholders position to or against UA program; the stakeholders interest towards UA program; and which stakeholders might form alliances. Findings from the force field analysis indicated that: growth in industry & service sector, lack of land and temporary availability, urban planners and policy makers knowledge, lack of improved farm equipments, input access, farmers skill and knowledge, public health issues and market shade access as restraining forces for the success of UA in Addis Ababa. On the other hand, it was indicated that poverty reduction and food security initiatives, farmer's motivation, market availability, employment needs and available labour force, were the major driving forces. Four Urban farming practices such as horticulture, small scale dairy, small scale egg chicken production, mixed crop-livestock and the land use scenarios were identified and described for action.

Key words: urban agriculture, Stakeholders, Soft System methodology, Force field analysis

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AAEPA	Addis Ababa Environmental Protection Authority
AAWSA	Addis Ababa Waters and Sewerages Authority
ACDI/VOCA	Agricultural Cooperative Development International
CBO`s	Community Based Organizations
BoFED	Bureau of Finance & Economic Development
CDC	Centers for Disease Prevention and Control
CSA	Central Statistics Agency
DAP	Diamonium Phosphate
EDA	Emanuel Development Association
ENDA	Environement Development Action
EPA	Ethiopian Environmental Protection Authority
ESCO	Energy Services Company
FAO	Food and Agriculture Organization of the United Nations
GASCO PLC	Agro industry accessories importing company in Ethiopia
HIV/AIDS	Human Immuno virus/ Acquired Immuno Deficiency Syndrome
JECCDO	Jerusalem Children and Community Development Organization
MOA	Ministry of Agriculture
MoWR	Ministry of Water Resources
NGOs	Nongovernmental Organizations
OR	Operational Research
PICDO	Progress Integrated Community Development Organization
PLA	Participatory Rural Appraisal
PLWHA	Peoples living with HIV Aids
RUAF foundations	Resources Centers for Urban Agriculture & Food security
SMEs	Small and Medium Enterprises
SSM	Soft Systems Methodology
SNV	The Social Networks for Sustainability
SWOT	Strength, Weaknesses, opportunity and Treats
UA/UPA	Urban Agriculture/Urban and Peri-urban Agriculture
UNDP	United Nations Development program
USAID	United States of America International Development

LIST OF TABLES

LIST OF FIGURES

1. Introduction

1.1. Background

Globally, about 200 million urban dwellers are urban farmers, providing food and income to about 700 million people (DGIP/UNDP, 1993). Urban farming has been well recognized in the developed world for decades, and is getting new momentum in developing countries. In Africa, it supports the livelihood of many urban and peri-urban low income families. Attributed, mainly to, such factors as rapid urbanization, ineffective agricultural policies, crippled domestic food-distribution systems, constrained public spending and subsidies, soaring inflation and rising unemployment, less purchasing power, and careless urban land use regulations and enforcement mechanisms, urban agriculture has shown significant growth in East Africa since the 1970s (Mireri *et al.,* 2006). Consequently, urban agriculture is becoming an important means of response to food insecurity arising from the above bottlenecks, and is playing significant role in achieving adequate nutrition and livelihood for the poor communities.

Rearing cattle, sheep, and chickens, or growing rain-fed crops such as maize and vegetables on plots found adjacent to their houses and away along river sides are a traditional urban and peri-urban farming practices in Ethiopia (G/Egziabher, 1994). These practices are mainly meant for household consumption, with some portions for sale. According to the above report, urban agriculture is an important activity that utilizes scarce resources such as land and energy efficiently, and is an ultimate survival strategy for low-income urban population. Therefore, urban agriculture is making considerable contribution towards satisfying the basic needs of the population dwelling in Addis Ababa. According to a report by CSA (2001) employment survey, agriculture employed 1.5% of the labor force in the city.

Ethiopia does not have sufficient transportation facilities that are equipped with cold stores to keep products fresh, while transporting from distant areas of their production. Therefore, most of the fresh produce sold in the cities should come from the nearby urban and per-urban farms (Gittleman, 2009). Studies conducted by Duressa (2007) and Gittleman (2009) indicate that urban agriculture has the potential for achieving food sovereignty, food security and increased quality of life for many people in Addis Ababa, and will remain as a

survival strategy for urban poor and additional income sources. However, urban agriculture and its land use, in the city of Addis Ababa, has many barriers such as decreasing of farm plot sizes, lack of access to loans for the farmers, and the use of traditional tools and methods that result in low productivity (ibid).

Most planners consider agriculture as a practice conducted in country sides and by some slum dwellers in the city. As the result, more emphasis is often given to lend a land for industry and housing in Addis Ababa city. Other major constraints of urban farming in the city include lack of policy issues on urban agriculture, limited working capital for farming and over-use of resources (ORAAMP, 2002). The Federal Republic of Ethiopia (FDRE) has formulated and implemented various policies, strategies, which have been registered significant achievements in the rural agriculture sector in the last three couple of years, but with less emphasis to urban and peri-urban agriculture (UPA) which led to insufficient consideration of small scale UPA producers to research and extension services (Nigussei, 2010).

According to Gittleman (2009), there is also a conflict of interest and mandate among stakeholders concerning the land use situation in the city. The Office of Urban Agriculture has no role in deciding on land use to stop the encroachment of the city's rapid development in to the potential agricultural lands found in its urban and peri-urban areas. As the result, the increased competition for urban land use is squeezing out the poor that are the main practitioners of urban agriculture. Therefore, the poor urban dwellers that couldn't compete with skyrocketing prices offered to urban and peri-urban land prices by industrial and housing projects are faced with the gradual displacement.

A study by Drescher (2001) indicates that stakeholders have, often, different priorities from urban planners. In most countries, urban farmers are not at all organized and, therefore, do not have political power; and women farmers have other interests and approaches than the male counterparts. Some stakeholders are always stronger than others. Individually weak stakeholders such as small-scale market gardeners have often proved to be able to get organized around common interests, and this exposes them to have plans revoked without taking their interests into account and with disregard to adjustment of their needs (van den Berg, 2000).

In order to understand the urban and peri-urban planning process, it is important to know who the stakeholders are and how they manage to have their interests reflected in the plans that are implemented. A fundamental step in this regard is to develop an urban agriculture plan and policy, recognizing the interrelated nature of food, agriculture, health and ecology to deal with food issues from a total system perspective (Tjeerd and Girardet, 1999). This could involve, among others, the Health Department, Planning Department, engineering, local economic development, water management and waste management. This implies that urban agricultural activities could also be recognized as major components of green zoning systems for which a dedicated policy must be formulated, developed and implemented (Ibid). There is also a need to consider the concept of green areas and ecolbelts to create positive interactions and reduce conflicts between rural and urban areas that promote a holistic food system development, which can help to assure ecologically, economically and socially sustainable urban agriculture and land use in the long term (Francis *et al*., 2005).

Although UA has multifaceted economic, social and environmental benefits, stakeholders also raise issues of human health and environmental hazards because of the contamination of pathogens and depositions of heavy metals used in the agricultural systems mainly due to intensive use of agrochemicals and using polluted irrigation water.

1.2. Objective of the Study and Research Questions

This study was, therefore, initiated to identify major stakeholders, and then to analyse, and evaluate the positions, interests, interactions and power relationships of key stakeholders of urban agriculture and agricultural land use systems and, thereby, to understand their influences on urban agriculture and food systems situations in the study area.

Taking into account the complex and problematic UA and food system situation in Addis Ababa, there is a need to study and identify, analyse, and evaluate the positions, interests, interactions and power relationships of key stakeholders. There is a need to better understand the role of urban and peri-urban agriculture for its local economic, environmental and social importance. Such information may help the **City's office of urban agriculture**, which is among the main stakeholders, to know the specific interest, power and leadership capacity of major stakeholders and to lead a concerted action among

stakeholders in order to attain the goal of sustainable urban agriculture and city food system.

Having the above general objective, the following research questions were addressed.

1. How do Stakeholders perceive urban and peri-urban agriculture and their land use systems? (Understanding the problem situation).
2. To what degree do stakeholders affect urban and peri-urban agriculture and their land use systems in the study area? (Express the problem situation).
3. What are the major causes and management mechanisms of issues that affect sustainable urban and peri-urban agriculture and land use systems in the study area? (Express the problem situation).
4. What are the purposeful perspectives which are employed in agriculture and its land use situations in the study area? (Holon's, followed by a possible "CATWOE" and root definition).
5. What are the core relevant activities within the selected, described relevant systems? (Followed by conceptual modeling).
6. How does the understanding of relationships impact the development and success of urban and peri-urban food production systems? (Define scenarios for action based on the above results).

2. Literature Review

2.1. Definition: Urban Agriculture

Various authors defined urban agriculture in different contexts. These definitions mostly include the question of where, what and why agriculture is practiced in cities. The major focus is distinguishing between rural and urban agriculture and agricultural activities conducted for other purposes. According to Baumgartner and Belevi (2001), definitions are mental tools to enhance understanding and describing complex situation. Therefore, it is important to clearly describe, the definitions by different authors for purposes of differentiation and clarification of this study.

Urban agriculture defined by Baumgartner and Belevi (2001) comprises the production, processing and distribution of diversity of food, including vegetables and animal products within (intra-urban) or at the fringe (peri-urban) of a city. Thus its main motivation is food production for consumption or sale and /or income generation. The following two authors also defined UA, in a similar fashion, but with more emphasis in urban resource utilization and the scale of urban and peri-urban agriculture practices. Thus for Sabine (2006), UA is an agricultural production, processing, and distribution activities within and around cities and towns, whose main motivation is personal consumption and/or income generation, and which compete for scarce urban resources of land, water, energy, and labour that are in demand for other urban activities. Therefore, UA according to this author can include small- and large-scale activities in horticulture, livestock keeping, fodder and milk production, aquaculture, and forestry - where several activities may or may not be carried out within one enterprise.

Among the most widely cited definitions of urban agriculture is by Mougeot (2000), in his definition, UA represents "an industry located within, or on the fringe of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and materials resources, products and services largely to that urban area".

On the other hand, to Van Veenhuizen (2006, cited in Christian M, 2011), urban agriculture is viewed as the growing of plants and raising of animals for food and other uses within and

around cities and towns, and it includes related activities such as the production and delivery of inputs, and the processing and marketing of products. However, the most important distinguishing characteristic of urban agriculture according to de Zeeuw *et al.* (2010) is that, it is an integral part of the urban economic, social and ecological system.

From those definitions, it is possible to say any agricultural activity that is practiced in cities and its fringe is considered as urban and peri-urban agriculture. However, Baumgartner and Belevi (2001) argue that a comprehensive understanding can be gained by enumerating and discussing further, some of the factors which affect urban and peri-urban agriculture. Therefore in this study, UA considers an agricultural activity practiced both in urban (inner city) and peri-urban (city fringe) agriculture.

2.1.1. Location & scale (where)

Although location is the most common element in defining UA, the question of "how" can the boundaries is defined? Why differentiate between inter-urban and peri-urban areas are the issues of debates? For these questions, different authors respond in different ways. Mougeot (2000) states that many authors believe distinction between "urban" and "peri-urban" helps for stakeholders in planning, intervention or production purposes. Whereas, others state that the significance of the distinctions between urban and peri-urban agriculture is unclear, since the motivation of the producers is often similar, the market is usually the same, and the issues of production and marketing are similar (Binns and Lynch, 1998). However, Mougeot (2000) argued several criteria influencing the size and shape of the peri-urban area, such as the urban influences, official city boundaries, travel time or distance to the centre. He further explained that, for peri-urban agriculture the location definition is more problematic. By contrast, intra-urban locations is well within the older and more settled urban fabric, whereas, peri-urban locations are in closer contact with rural areas and tend to undergo, a more dramatic agricultural changes than do locations in more central and built-up parts of the city.

Therefore, for Baumgartner and Belevi (2001) the reasons to differentiate between urban and peri-urban could be the fragmented nature of the institutional landscape, its unplanned conditions, fast growth, extremely fast changes of social, economic, environmental situations and increase in serious use conflicts of peri-urban areas as compared to inner

city situations. The peri-urban area is a zone of transition. This author believe that availability of land is very often the crucial element for people to become engaged in urban agriculture than the peri-urban situations, but even more so is its access. This implies both manner of land use and legal aspects, as well as a near and secure access.

2.1.2. Activities & stage (what)

The "what" question in urban agriculture may comprise all or part of different activities and stages: acquisition and utilization of the necessary resources, inputs and services; production of goods; post-production including processing, packaging, distribution, marketing, recycling, and consumption Smit (1996, cited in Baumgartner and Belevi 2001). Except for consumption, all these activities have to be included in the urban agriculture definition. Furthermore, all activities like home gardening, horticulture of food and non-food products (ornamental plants), aquaculture, livestock, and forestry form part of urban agricultural production. According to this author, if the entire agribusiness with suppliers of seeds, fertilizers and pesticides, as well as banks and credit agencies providing financial support for UA are included, the number and variety of stakeholders engaged in urban agriculture is much higher.

2.1.3. Stakeholders (who)

Stakeholders are those Actors (persons or organizations) who have a vested interest in the policy, project or program that is being promoted, are considered to be stakeholders in the process (Kammi 1999). In line with this, various actors are involved in urban agriculture: they are the producers, suppliers of resources, inputs and services; the transporters, the processors, the retailers, the consumers, the promoters, and the managers. These actors may belong to the public or private sector; the formal and informal economy.

2.1.3.1. Urban farmers

Most urban farmers are low-income men and women who grow food largely for self-consumption, on small plots which they do not own, with little if any support or protection. They tend to come from smaller towns; majorities are not recent arrivals (Mougeot, 2000). In addition, Baumgartner and Belevi (2001) mentioned that in most developing countries, the urban farmers belong to low income groups, who are relatively long term city residents, moderately poor, and frequently females (Smit,1996). However, they exist in all regions of

the world, and face vastly different conditions and opportunities. In Addis Ababa, urban farmers are marginally better off than the absolute poor (Duressa 2007).

2.1.3.2. Consumer, supplier, processor and public sector

According to Baumgartner and Belevi (2001), in urban agriculture, the consumer is both the subsistence farmer consuming his own food, as well as the customer on local markets and consumer of food purchased from street vendors. Those stakeholders who provide inputs and services required by the process of production in urban agriculture are suppliers. This group is more organized and focused in rural agriculture, in contrast to the relatively unorganized and relatively disparate small-scale producers in urban area. Additionally, credit providers, including banks, credit unions and farmer associations are essentially included in this category. Whereas, the processors are very heterogeneous groups, which include the poor women selling a small amount of cooked food on the street and big companies processing, distributing and selling large quantities of processed and unprocessed products.

The other important group of stakeholder is the public sectors who are the government organizations and institutions. This group has big influence in cities where the activity is considered illegal or neglected by governments and the performance of urban agriculture is low. Here, urban planners and local governments should consider how to incorporate environmentally sound urban agriculture in their plans and byelaws (Sabin 2006). In addition, local authorities, urban producer groups, (CBO`s, NGO's, universities) are important stakeholders mentioned by de Zeeuw *et al.* (2010) to create a multi stakeholder platform on urban agriculture. These stakeholder groups help to develop a city strategic agenda on urban agriculture and food security and to design and implement local urban food production, processing and marketing in many cities.

2.2. Roles of Urban Agriculture

2.2.1. Food security

"Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2002). Over the last decades, there has been a growing recognition of the significance of urban and peri-urban

agriculture for poor people's livelihoods and to the food security of the poor, particularly in urban slums. Even in large, congested cities, the urban poor often have a home garden or raise small animals as part of a coping strategy. This urban production, often done by women, the sick and unemployed, can complement household incomes and improve the quality of urban diets (Sabin 2006).

The Specific situation of food security in the urban context are, on the one hand, the necessity to purchase most of the food required by the household and, on the other, a greater dependence on the market system and on commercially processed food. Therefore, employment and income are the main prerequisites for attaining food security (Baumgartner and Belevi, 2001). Thus, urban agriculture, in principle, has a positive impact on the food security situation of the households that engage in this activity through two main avenues: the income it generates, and the direct access to the food which is produced. In addition, households that engage in farming may have access to a relatively cheaper food, and to a wider variety of particularly nutritious foods, such as vegetables and products of animal origin (milk, eggs, and meat). Under such conditions direct access to food may allow households to consume greater amounts of food and a more diversified diet, richer in valuable micronutrients (Alberto and Luca 2006).

In several African cities, incomes earned by urban farmers have been found to be a significant contributor to household maintenance. For example, farmers in Accra produced (1-8) month's supply of staple foods for the family and used their farm out puts for consumption-smoothing and income diversification strategy. Especially, for vegetable growers, income from farming could represent significant amounts and proportion of total income (Nugent, 2000). The same author also mentioned, in Dar es Salaam full time production of certain vegetables or keeping few dairy cattle and a garden can produce an income of US £60/month, which is 30% greater than the average salary in the country. The same is true for the Nairobi families in slum areas, although they sold relatively little and consumed at home. In addition, these families standard of living exceeded the neighboring non farming families.

According to the Ethiopian food security strategy, as discussed by Tefera (2010), the causes of food insecurity both in rural and urban areas of Ethiopia are varied and

multifaceted. However, it is indicated that, low income households in informal sector, the elderly, disabled and sick, female-headed households, street children and urban poor vulnerable to economic shocks (eg. rising food price) and HIV/AIDS victim families are among the most food insecure group of people in urban Ethiopia.

Urban farmers in Addis Ababa produce a variety of crops and livestock for home use and/or market purposes. "Mixed farming is the most common activity by many urban farmers in the city which implies farmers' options for diversification. This was found to contribute 65% to livelihoods of urban farmers at both sectoral and household levels, for which livestock and crop production accounted for 40 and 45%, respectively" (Duressa, 2007). Urban agriculture is, therefore, contributing a lot in reducing the problems of urban households' food insecurity by improving access to fresh and low priced food and raises the nutritional status of the residents.

2.2.2. Poverty alleviation

The benefits of urban agriculture as it was described by Smit and Nasr (1992) vary with time and place. It is often a first line of defense against hunger and malnutrition at times of particular stress and a major process of poverty alleviation during periods of economic recovery. Structural unemployment, currency devaluation, inflation and elimination of subsidies for basic needs have all reduced the opportunity of the urban poor and middle-class to acquire healthy food (Baumgartner and Belevi 2001; Nugent, 2000). Moreover, poor families can spend 60-80% of their income to purchase food, but still be food insecure (Nugent, 2000).

Thus by growing their own food, people produce food for personal consumption or for sale. Consequently, income is generated. This helps them to save money they would otherwise have spent to buy food. This is especially significant for poor women who must often manage scarce household finances and face budgetary constraints which initiate them to increase their income-generating activities. Therefore, urban agriculture can contribute significantly to municipal, regional and national efforts to deal with poverty (Baumgartner and Belevi, 2001).
Urban residents in Sub Saharan African countries, engage in agricultural activities spontaneously, responding to their circumstances for a variety of reasons, but notably for

ensuring household food supply, supplementing income or specifically to generate profit (Binns and Lynch 1998). According to Mireri *et al.* (2006), the majority of urban households in Kenya are unable to feed themselves adequately from their earnings, and those who are able, cultivate land in backyard spaces, on roadside, or on other publicly owned vacant lands considering subsistence farming as an economic imperative. Hence, satisfaction of basic needs is the primary motivating factor governing their behavior, rather than profit making and capital accumulation. In Nairobi, over 50% of urban farmers used the entire amount harvested to feed their families or dependants.

There are many NGOs in Addis Ababa helping urban dwellers to support their livelihoods through UA program. The USAID Urban Gardens Program is among others, promoting intensive urban agriculture and water saving technology including trickle and drip technologies. This program is promoting fruit trees and poultry and has reached more than 15,000 orphans and vulnerable children in 5,000 households by creating school and community gardens (Gultineh and Jillian 2009). In addition, a study was made by ENDA Ethiopia in its project in Addis Ababa for improving the nutritional and economic status of 100 PLWHA. As this study revealed, Ninety eight percent of the respondents showed willingness to participate in urban agriculture and Ninety three percent agreed that production of vegetables in urban areas is possible; of these 49% have already practiced urban agriculture, and 22% are practicing it currently. Kale, Spinach, Salad, and Green Pepper, are the main vegetables PLWHA are currently cultivating (Degefa *et al.* 2006). The study also proved that much of the output from urban farming is consumed at home, thus the contribution of urban agriculture to overcome poverty is significant.

2.2.3. Sustainable resource utilization and management

Even though cities occupy about two percent of the surface of the earth, they are the principal consumers of its natural resources and produce more than 70% of its waste (Fraņcoise, 2009). Moreover, as Baumgartner and Belevi (2001) mentioned, urban waste is considered one of the most serious urban environmental problems and most cities focus on simply getting rid of their waste and fail to recognize its economic asset. However, the relationship between urban agriculture and urban resource management can be described in three ways. First, waste water and organic solid waste can be recycled and transformed in to opportunities for growing agricultural products. Second, some areas of cities such as

idle lands and bodies of water can be converted to intensive agricultural production areas. Third, other natural resources such as energy for transportation and cooling can be converted through urban agriculture Sachs and Silk (1990, cited in Smit and Nasr, 1992). Thus urban agriculture is a clear and significant way of converting the conventional consume-dispose open loops systems in to consume-process-reuse closed loops system (Baumgartner and Belevi, 2001).

According to Smit and Nasr (1992) urban agriculture can play an especially significant role in the recycling of organic wastes such as waste water and solid wastes. This especially in arid and semi arid regions, where water availability is very limited, nutrient-rich waste water provides precious agricultural inputs. Example, Mexico city pumps half of its sewage 50 miles to North, where it is to irrigate over 100,000 hectares for livestock feed to convert safely in to human food. Moreover, Calcuta city produces one third of its fish from sewage fed lagoons and similar share of its vegetables from waste water irrigation Ghosh (1990 cited in Smit and Nasr, 1992).

On the other hand, solid waste can be an input to urban agriculture. Inorganic solid waste is a source of soil, construction debris can be the base for shaping fields and ponds, planting containers are built from wood and plastic of all sorts, tiers are used as containers and barrels hold irrigation water, plastic bags are used as a mulch to conserve water and retard weeds. The leading organic solid wastes are the food waste: example cabbage and green coconuts in tropical climates, street trees and grass clippings in temperate climates are important. With proper concern about the lead content of some colored inks, paper is also a good mulch and soil enhancing agent (Smit and Nasr 1992).

All cities and towns has a number of underutilized and vacant spaces that can be used for urban agriculture. These are spaces not suited for built up uses, idle public and other lands, community lands and household areas. In addition, urban agriculture can decrease the daily flow of food into cities; reduce traffic injuries and negative impacts on air quality, and save fossil fuel resources Nelson (1996, cited in Baumgartner and Belevi 2001).

2.2.4. Social impact

Urban agriculture can help as an important strategy for social integration. Several NGOs have initiated urban agriculture projects that involves disadvantaged groups such as orphans, disabled people, women, recent immigrants without jobs, or elderly people, with the aim to integrate them more strongly into the urban network and to provide them with a decent livelihood (UNDP 1996). However, in more developed cities, urban agriculture may be undertaken for the physical and/or psychological relaxation it provides, rather than for food production per se. In addition, urban and peri-urban farms may take on an important role in providing recreational opportunities for citizens such as for recreational routes, food buying and meals on the farm, visiting facilities or having educational functions like bringing youth in contact with animals, teaching about ecology (Ibid).

Urban agriculture also has a positive impact on public health, mainly through increased food security and, consequently, improved health conditions of the individuals. Appropriate waste management system leads also to a decrease in health risks. Furthermore, working in the home gardens may have a recreational value and improve the physical and mental health of the individuals. It also contributes to decreasing respiratory diseases in communities due to improved air quality by increasing the greening of cities (Baumgartner and Belevi, 2001).

USAID Urban Gardens Program and ENDA-Ethiopia are two nongovernmental organizations in Addis Ababa, making huge effort to use urban agriculture in improving the nutritional status of HIV/AIDS infected or affected women and children. Bothe NGOs identified that participation in different urban agriculture programs benefited the participants beyond improving food security; rather it helps them to build the individual's capacity to produce and consume nutritious foods, reduce stigmatization, and improve self-esteem and social inclusion (Gultineh and Jillian 2009; Degefa *et al*. 2006).

Moreover, UA connects well with women's traditional child care-taking and general household management situations. In that women perform numerous vital roles directly related to urban agriculture, and actively participate especially in urban gardening for home production. Furthermore, since women are still disadvantaged in the formal sector of urban economy, they get involved in small scale production (Mougeot 2000).There is evidence

also that UA affords women with greater control over household resources, budget, decision-making and benefits. Many re-invest their savings into their children's education, into small upstream (bulk purchase and retail trade of manure, the case of Haiti) or downstream (food processing and street vending, the case of Nairobi) of UA enterprises, as well as into other small businesses Dennery, Chauca, Moustier (1997, 1999, 1996, cited in Mougeot, 2000). Mougeot (2000) also explained that when women are denied land ownership in their traditional communities of origin, or when they cannot inherit their husband's estates, they have used UA, to finance their purchase of a house in the city.

3. Materials and Method

3.1. Description of Addis Ababa City

This study was conducted in Addis Ababa, which is situated in the centre of Ethiopia. Addis Ababa is served as the economic and political capital of the country. The total population as per the 2007 population and housing censes result was about 2.7 million. Of these female accounted for 52.4% and male 47.6%. On average the city population is growing at 2.1% annually.

According to BoFED (2010), the Addis Ababa population images census result shows, 50% of the total households were living in under the poverty line. The city has a total land area of 54,000 hectares divided in to 10 sub-cities which consists of 100 Kebeles[1] (Figure 3.1). The sub cities include Addis Ketema, Akaki-Qality, Arada, Bole, Gulele, Kirkos, Kolfe-Keranio, Lideta, Nifasilk-Lafto, and Yeka. The CSA (2007) data indicates that 10,773 hectares of land was cultivated, while forest and range lands cover 7,900 and 2,943 hectares, respectively of the total land cover of the city (Nigussie, 2010).

Addis Ababa has a mild climate and is found at 2408 meters above sea level. Its average daily temperature is about 16°C, mean annual precipitation is about 1180 mms and has unimodal rainfall regime starting from June to September (Duressa 2007). Dry seasons occur in October through February.

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[1] The then Kebeles are upgraded to district administration level in a recent administrative restructuring
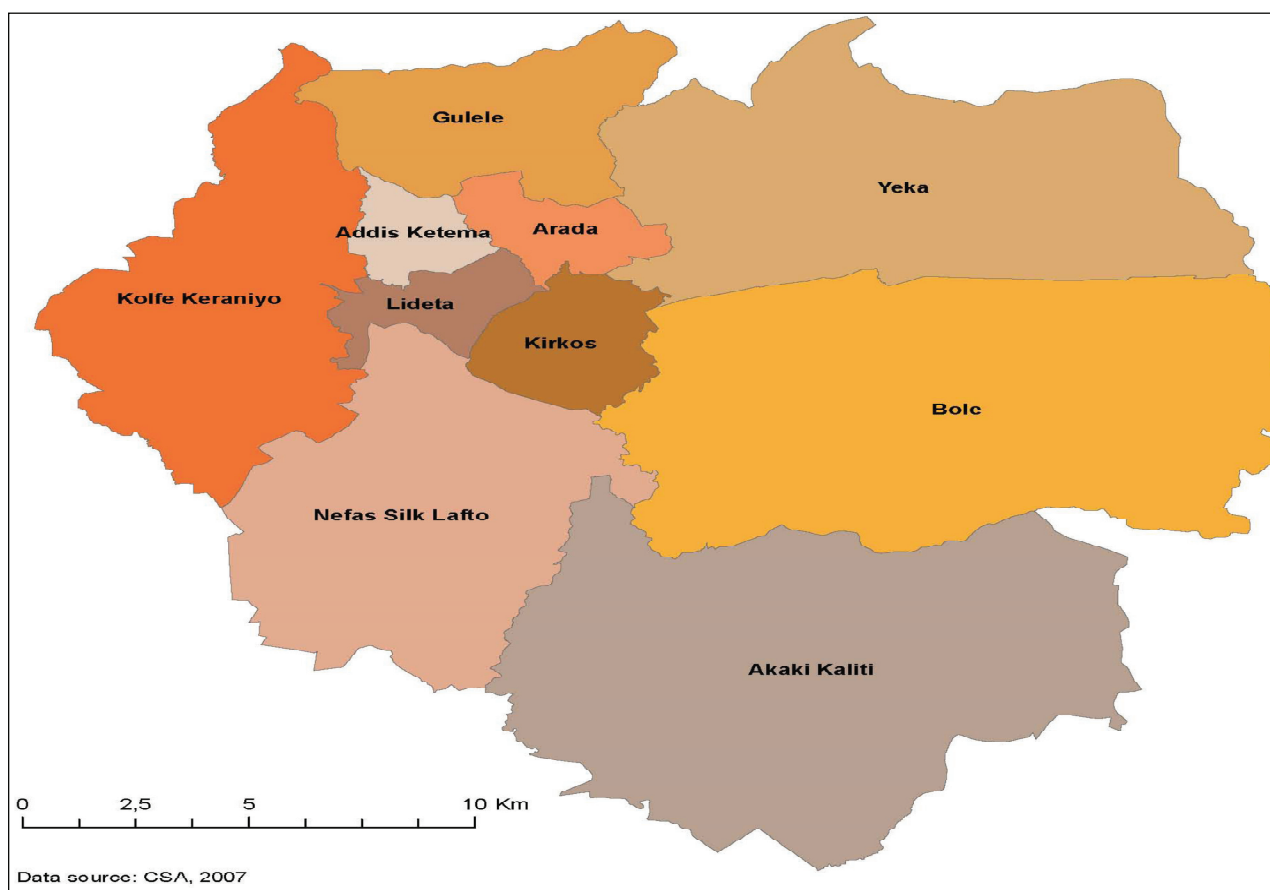
Figure 3.1: Addis Ababa administrative division by Sub-city (Nigussie, 2010)

The city also posses' year round small rivers, suitable soil and altitude (see Figure 3. 2). These small rivers and streams, as well as the limited sewer line of the city, are tributaries of the Akaki River (Weldesilassie *et al.*, 2010*)*, which is the source of irrigation water for most vegetable growers in the study area. The major crops produced in the peri-urban areas include teff, wheat, lentil, and Grass pea while farmers along river banks grow vegetables.

The CSA (2005) data shows that there are 31,062 hybrid and 35,704 local dairy animals, 28,486 small ruminants, 360,777 chicken and 1,546 beehives (Nigussie, 2010).The National livestock development master plan (2007) data mentioned 26,266, 11,052, 4,079, 437, 6,078, 364, 0, 22,156 Cattle, Sheep, Goats, Horses, Asses, Mules, Camels, and Poultry respectively are found to have a role in the city agriculture.

The annual milk supply to the city is estimated to be 55 million liter of which 70% is produced within Addis Ababa mainly from hybrid cows. In addition to milk production, these hybrid dairy cows are sources of breeds for other cities in the country (Nigussie, 2010).
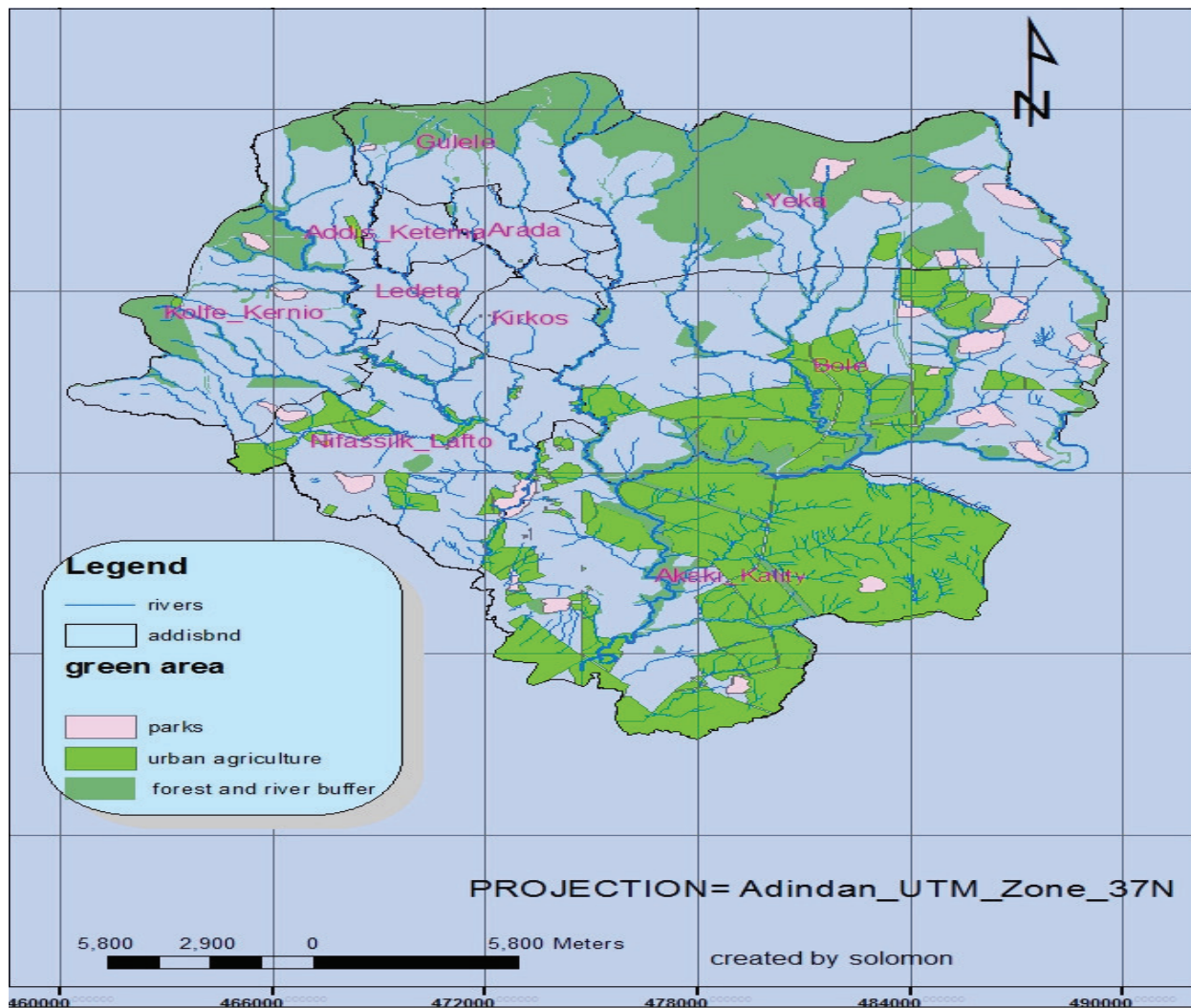
Figure 3.2: a map showing the land use situation in Addis Ababa (AAEPA, 2011)

The contribution of urban agriculture to the city`s GDP is relatively very small as compared to the industry and the service sectors. Its share has decreased from 0.37% in 2005 to 0.3% in 2006. According to CSA (2006) survey result, the contribution of agriculture and allied activities for employment in percent decreases from 5.29 in 2005 to 1.07 in 2006 (BoFED 2008). But, its contribution in million dollar terms shows an increase from 60.20 in 2007 to 144.9 million ETB[2] in 2009.

3.2. Description of Selected District (Woreda 02/04)

The district is located at the southern tip of the city, which is 25 km far from the center. It is among 11 districts in Akaki-Qality sub city. Most parts of the district is categorized under

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[2] One United States of American dollar currently is 17.5592 Ethiopian birr (ETB)

peri-urban type which is bordering the rural areas of Oromia regional state. It has plain type topography with an average altitude of 1800 to 2700masl.

Moreover, the socio-economic situation, the land scape and its land use system (figure 3.3 and 3.4) signifies more of a rural characteristic.
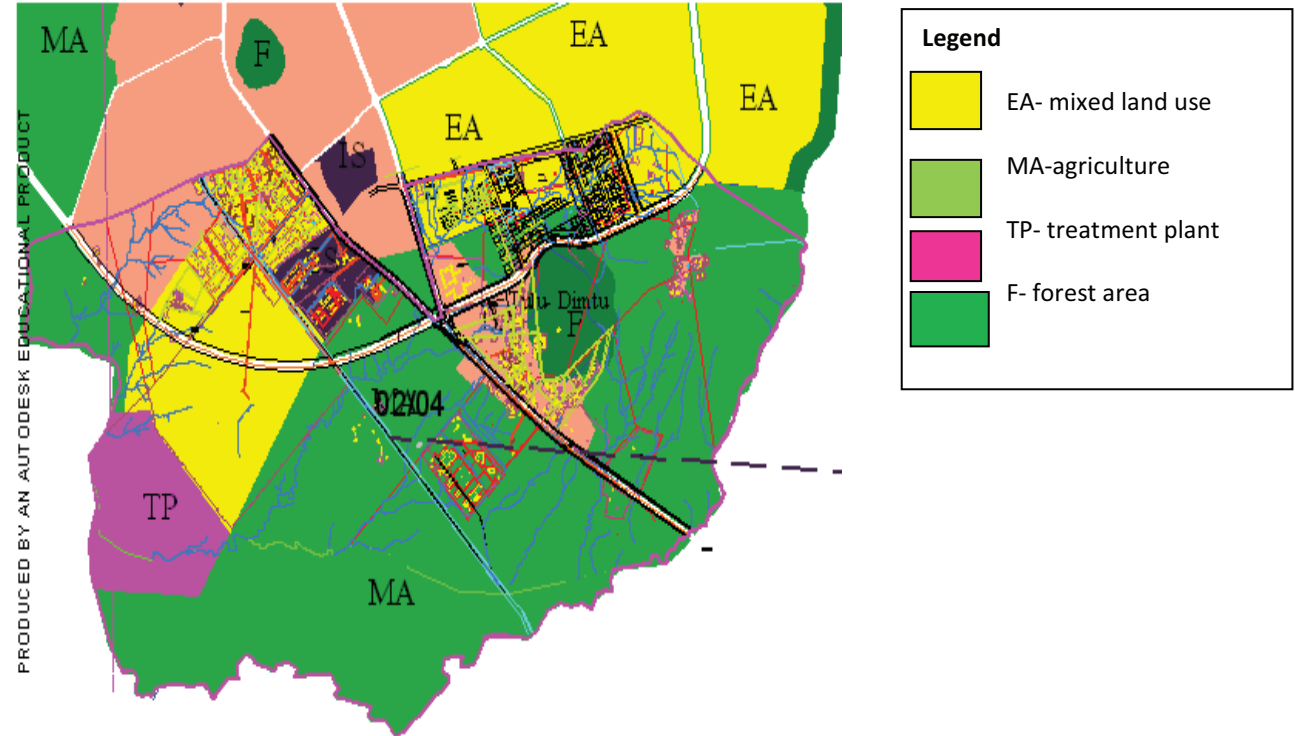
Figure 3.3: diagram showing the land use situation in the selected district (district plan and information office 2012)

Figure 3.4: picture showing the agricultural land use in mixed agriculture and the land scape situation in the district.

3.3. Sampling and Data Collection

The basic framework used in this study is soft system methodology (SSM) for the purpose of understanding and describing the complex situations in urban agriculture and land use system. This was carried out in two ways; first, was by selecting the relatively small area (district) in the city and applying five of the seven steps in SSM. Second, was through stakeholder analysis. Thus sampling didn't follow strictly the probability random sampling technique; rather a purposive sampling method was used, except in the case of individual farmer selection.

3.3.1. Selection of representative sub city, district and Farmers

Selection of one district was made to apply the five steps of SSM used in this study. Addis Ababa city has ten sub-city administrations most of them with urban and peri-urban settings. Then, based on a multi-stage sampling approach, selection of one district was made purposely. At the first stage, one representative sub city (Akaki Kality), with both urban[3] and peri-urban[4] setting was selected.

At the second stage, one representative district (02/04 District) was selected using the same criteria for the selection of sub city. From this district, one vegetable cooperative (with 23 women members), one mixed crop-livestock farming cooperative (43 women and men members), three small scale poultry enterprises organized under small and medium enterprises (SMEs), three individual vegetable farmers, three small scale dairy enterprises and one home garden in the inner part of the district were included in the sampling framework. Five-individual mixed crop livestock farmers were selected randomly from the farmers list in the district.

Thus in total, 84 farmers in the district were either personally participated in the study or represented by their organizations (cooperatives or SMEs). All selections were made with the help of experts from the office of agriculture in the respective administration level. Moreover, Participating in the study was entirely based on informed consent.

3.3.2. Selection of representative stakeholders

For the purpose of stakeholder analysis, primary and secondary stakeholders (Annex I) were selected and contacted for interviewing both in the selected district and stakeholders at city administration level that helped to understand policy issues and some generic features of the problematic situation in the city. A multiple case (stakeholders sectors of participation) study design was used. The number of stakeholders contacted was determined by the number of cases to reach saturation, and six to ten cases are suggested by Yin (1994). In addition, the study applied the principles of "higher numbers are always useful" if they help to answer the research questions and gain credibility.

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[3] UA in the inner part of the city, practiced in small areas of land with mostly garden flowers and vegetables
[4] UA towards the border of the city with a relatively large areas of land, practicing mostly common field crops

In this study, Yin principle is fulfilled by including diversified stakeholders working in different sectors as the resource and time available possible.

Before the actual data collection, some primary stakeholders (farmers and personnel's from office of agriculture in the city) had been contacted to know exactly what happened to them due to a complex urban agriculture and land management situation in the city. This approach helped the researcher, to make further enquiry more focused and it also helped to pre-test the questionnaires.

3.3.3. Data collection

Data were collected using participatory method with the help of principally, two open ended questionnaires: First, is a questionnaire for primary stakeholders who mainly include individual farmers, farmers' cooperatives, SMEs and farm product distributors. The farmers participatory discussions focused on some major issues like: characterizing crop production sub systems, characterizing the livestock subsystem, natural resource management, market chains of major products and if there is environmental or personal health impact encountered through the process of agricultural practices (Annex II). Second is a questionnaire for stakeholder analysis (Annex III), which mainly included issues like the perception of the stakeholder on urban agriculture and land use system, supporting and oposion level, the interest, knowledge and decision making power of major stakeholders listed.

One stakeholder workshop at district level was conducted after data collection had been completed, which could helped to understand the different perceptions and identify key issues like the driving and restraining forces in the district urban agriculture and land use system. This step according to Warne (2000) is also important in understanding the conflict and to know future desire of stakeholders.

In addition, a secondary data were collected by reviewing and analyzing previous researches and collecting some relevant basic data from Central Statistics Agency and BoFED. This is a divergent or exploration phase, with the question, what is? In the SSM learning cycle.

According to Kolb (1986; in Wilson and Morren, 1990), apprehending and comprehending process takes place through transect walk, where the mind process something that senses, hear, see, feel, smell and taste, and try to give meaning the situation by relating it to past experience through formal and informal learning. In this phase, it is important to be open-minded to gather as much information as possible. Moreover, it needs to be careful to stay an objective observer to avoid bias. However, what we see is influenced by our opinions or preconceptions. In this study, therefore, more focus was paid, only on what had been seen and perceived and or informed by the farmer or other stakeholders.

3.4. Describing the Problematic Situation/Analysis

3.4.1. Using the soft system methodology (SSM)

Soft systems methodology was applied to address the research questions and meet the objectives. The process of SSM includes four stages and seven steps learning cycle as suggested by Checkland (The OR Society 2012).

> *SSM is a method used to support and structure thinking about, intervening in and making improvements to complex, problematic situations. It was developed out of the systems thinking approach, when traditional methods were found to be unable to deal with situations with no clearly defined and commonly agreed upon outcomes. It is also an alternative of the traditional and rigid reductionist system approach.*

This study covers five of the seven steps in SSM (Annex IV) in order to get a holistic understanding and describing urban and peri-urban agriculture in the study area. Thus, step one and two would help to understand the problematic situations and expressing it by a rich picture, SWOT analysis and forcefield analysis; step three and four would help in thinking about systems which may be used in the situation, including identifying root definitions and creating conceptual models of the system (Williams 2005). As Checkland and Poulter (2006) explained, the relevant human activity systems (perspectives) would be developed in to root definations in order to make sure that the learning process is not random, but organized, one which can be recovered and reflected. In this study, thirteen relevant perspectives were identified and four of them were taken for further root definations based on their importance in managing the major hindering forces in UA.

Experiencing the situation through field work participation,field observation by transect walk and gathering some facts about urban agriculture led to inferences about the whole picture

of the system using "tree metaphore"[5]. Moreover, stakeholders' analysis and some participatory learning and action (PLA) tools such as force field analysis, and SWOT analysis (analysis of strength, weakness, opportunities and threats) were used to describe the problematic situation in UA.

3.4.1.1. The rich picture

The first step in describing a problematic situation by applying SSM was drawing a rich picture using a tree as a "metaphors". A rich picture as it was defined by Monk and Haward (1998) "is a cartoon-like representation that identifies main stakeholders, their concerns, and some of the structure underlying the work context. It is an iterative process of understanding a situation and then refining that understanding with the concerned actors". Therefore, rich pictures are advocated as one suitable means of expression of the situation. This is a converging phase in the learning cycle of SSM. It indicates, what does it mean? That helps to assimilate, structure, and analyze the situation. Drawing the rich picture was among the different steps in the convergent phase and is particularly useful to start processing the information.

In this study, a rich picture was drawn using a tree metaphor. It is possible to describe something so that the image-part plays the role of a "stand-in" for the unknown or abstract concept. It plays an important role for our ability to understand the situation and when there is, a new concept, it helps to ask "What does that mean?" (Arne 1997).

According to Lieblein (2010), "metaphors invite a conversational style where meaning and significance emerge through dialogue, not imposed, rather it has to be evoked. It creates distance and space from conventional ways of thinking, which is vital in trying to unlock new understandings, because one cannot create the new in terms of the old way of thinking". It also play a crucial role in creating space for change, because it is immediate and personal, rather than distant or abstract (Ibid). Metaphors that are generated in participation in a change project are often more powerful than those generated from outsiders, because they are directly owned and have immediate meaning, and this iterative

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[5] Metaphor Is an image of something, mostly a link between a well-known figurative object " the image part" and some unknown or abstract matter "the meaning part"

behavior of a metaphor relates more to a rich picture to create a contextual understanding and meaning in a complex situations.

3.4.1.2. SWOT analysis

SWOT according to Maxipedia (2012) is a PLA tool, that can help to identify the strength and weakness as an internal driving forces of a system; and opportunity and threats as an external pressures that either the organization or group use to bring a change (opportunity) or needs to be careful of the negative effects (threats). Thus, opportunities and strengths were taken as helpful factors; and weakness and threats as harmful factors. These were identified from the situation analysis and understanding, using two questionnaires from farmers discussions (annex II) and selected stakeholders opinion analysis (annex III).

3.4.1.3. Force field analysis

Kurt Lewins force field analysis is a step by step analysis of forces or factors either driving or blocking a movement towards a goal. Some of the steps include defining the desired state, identifying the driving and restraining forces, and evaluating and ratting of the forces (Change-Management-Coach.com 2008). Kurt Lewins theory, assumes that in any situation there are both driving and restraining forces that influence any change that may occur. Thus, in force field analysis, driving forces are those forces affecting a situation that are pushing in a particular direction; they tend to initiate a change and keep it going, while restraining forces are forces acting to restrain or decrease the driving forces.

3.4.2. Stakeholders analysis

Stakeholder analysis is a process of systematically gathering and analyzing qualitative information to determine whose interests should be taken into account when developing and/or implementing a policy, project or program (Kammi, 1999). Policy makers and managers can use stakeholder analysis to identify those key players or stakeholders; to predict whether they might support or block the implementation; and develop strategies to promote supportive actions and decrease opposing actions before attempting to implement major reform at the national, regional, local level (Ibid).

Stakeholder analysis guidelines (Kammi, 1999, John and Catherine 2004) used as a tool to know the stakeholders' knowledge, interests, positions, alliances and importance related to

the situation. Stakeholders analysis according to Kammi (1999) has eight steps which include planning the process, selecting and defining a program or policy, identifying key stakeholders, adapting the tools, collecting and recording the information, filling in the stakeholder table, analyzing the stakeholder table and using the information.

Thus, in this study, stakeholder analysis went through seven of the steps mentioned in one way or another: listing of major stakeholders and describing why they were selected (Annex I), this was carried out, by reviewing of secondary data and discussion with key informants (Experts in the office of agriculture in Addis Ababa); identifying appropriate personnel in an organization to be contacted for interviewing and tabulation of appropriate data for analysis were among the major steps followed.

The above steps in the analysis started with identification of the different cases or sectors of internal and external stakeholders, registering why they are selected (Annex I).

The stakeholder characteristics such as knowledge on UA, interests related to the program, position for or against the program, potential alliances with other stakeholders, and ability to affect the process (through their power and leadership) are analyzed. In order to identify these characteristics, the exact stakeholders information or characteristics should be defined first. Therefore, characteristics such as: each stakeholders name, position and organization, internal/external to the organization, knowledge, position, interest, alliances, resources, power, and leadership terms are defined in (Annex V). Once the terms have been defined, the interview responses had been translated to stakeholder analysis table, before analysis and comparison of information was conducted. Stakeholders table was created in a word processing application (formatted landscape) with a list of stakeholder characteristics across the top row (Annex VI).

After the stakeholders table was completed, the information needs to be "analyzed." The analysis was focused on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible alliances regarding the UA program in question.

All the data collection and analysis was carried out in between half of December 2011 and April 2012.

4. The present Situation: Results and Discussion

4.1. Rich Picture using Tree Metaphors

In this analysis, the present situation of district urban agriculture was expressed by the rich picture below, using the tree and its component parts as a metaphor. As Arne Stjernholm (1997) explained, let the well-known concept function as "stand-in" for the unknown. When metaphors are introduced from the outside, it's crucial that people be encouraged to find and elaborate meaning for themselves. Although detailing the implications of a metaphor decrease its evocative power; however, we can argue about the different parts of a tree as discussed below.
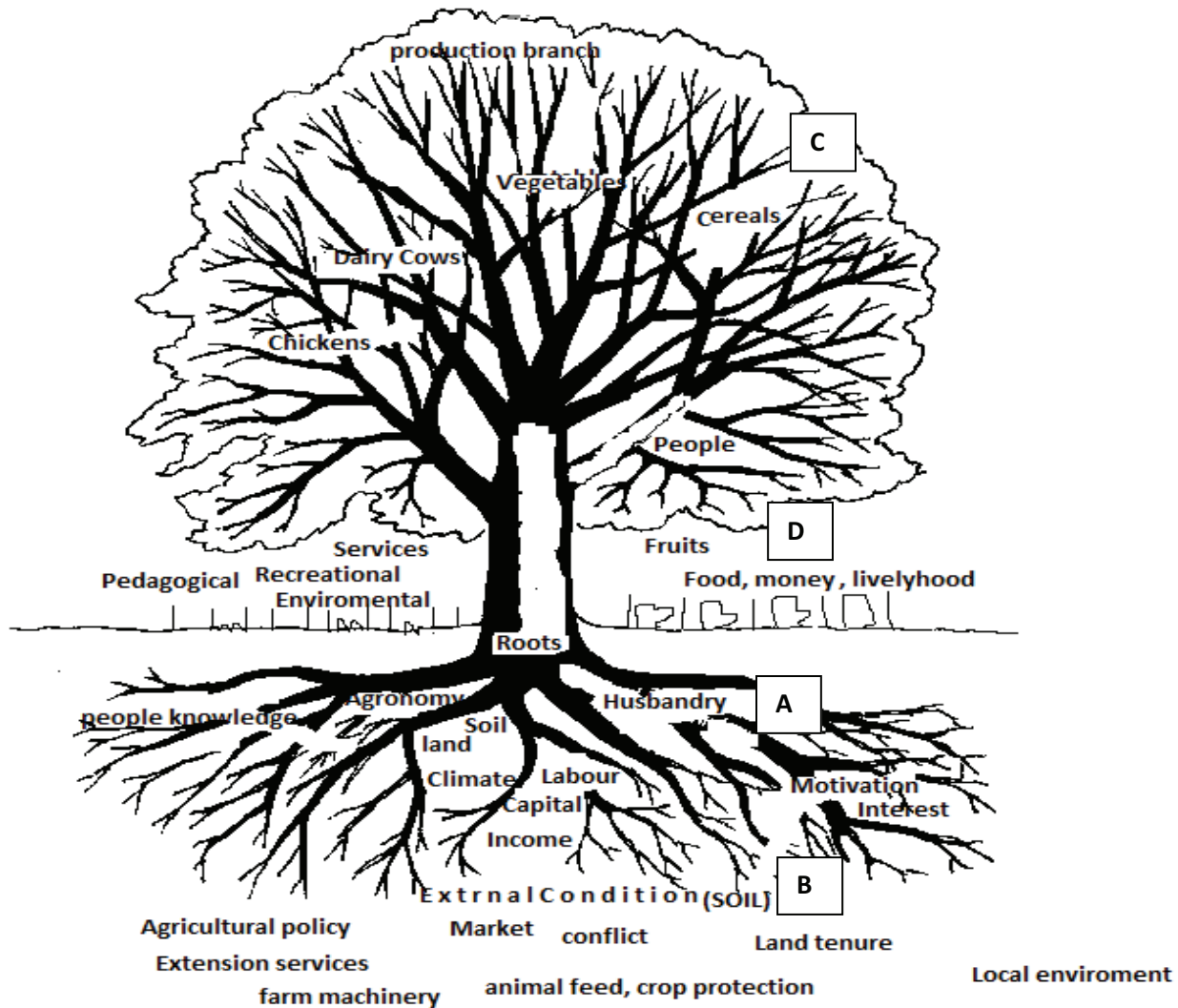
Figure 4.1: Rich Picture for District urban agriculture situation using a Tree Metaphor

A. Internal conditions: The roots represent the internal conditions that may include the agronomic, husbandry, economic and social conditions and they are the production potential of urban agriculture. These all conditions can probe other entities within. Agronomic condition include soil condition (soil type, fertility, manure), water source (irrigated, rain fed), land acquisition (own, leased, contracted), labour (own, hired), capital (buildings, machinery) and climatic condition of the area. The economic condition also includes the income from product sale and loan. Even, it is possible to discuss about social impact like peoples knowledge, skill, competencies, and peoples motivation for improvement and livelihood as a bases for development.

B. External conditions: The soil represents the external conditions or outside influence, which may include urban agricultural policies, extension services given to urban agriculture practitioners, environmental pollution, external market (where to sale, who buy), land use conflict and local environment, neighbours and public opinion.

C. Production branches: It is also possible here, to discuss about the different production activities represented by tree branches. An important part of the system which bring forth the fruits and this part may include: crop production sub system like acreage of different cereal crops, vegetables, soil management, fertilisation, crop protection, harvesting. Animal production subsystem such as dairying, egg chicken production and feeding strategies, types of feed and storage.

D. Fruits: Fruits represent the food and services rendered from the farm. It also includes questions connected to food (yields, quality, processing and consumption) and others like pedagogical, recreational, environmental and the landscape services. Cereal crops (wheat, teff, chickpea, Grass pea etc), Vegetables (potato, cabbage, carrots, etc) amount and type of animal products (milk, meat, eggs).

Therefore, this rich picture was presented to district workshop participants including farmers to see their situations based on a tree metaphor as a rich picture. They made an important analogy of the tree growth from roots to branches and producing fruits, with their aim of development from small to large scale businesses. Some of them envision upgrading to involve in processing and industry sector in the next five to ten years.

4. 2. SWOT Analysis

This SWOT analysis is the results of farmers and stakeholders discussion in the district. The four categories: strength, weakness, opportunity and threats were analyzed from multiple perspectives as environmental, economical and social elements.

Table 4.1: Strengths, Weaknesses, Opportunities and Threats Analysis

<table>
<tr><th colspan="3">Internal Forces</th><th colspan="2">External Forces</th></tr>
<tr><td></td><td>Strengths</td><td>weakness</td><td>opportunities</td><td>threats</td></tr>
<tr><td rowspan="3">Agricultural Land Use</td><td>Environment
• open spaces
• river sides</td><td>Environment
• policy</td><td>Environment
• poverty
• food security</td><td>Environment
•land speculation
•land tenure</td></tr>
<tr><td>Economy
• market
• labour</td><td>Economy
• loan service
• temporary use</td><td>Economy
• technology efficient utilization of land</td><td>Economy
• industry &
• service sector development</td></tr>
<tr><td>Social
• esteem development
• integration
• skill development</td><td>Social
• culture in land use</td><td>Social
• population increments</td><td>Social
•urban planners & policy makers knowledge</td></tr>
<tr><td rowspan="4">Vegetable Production</td><td>Environment
• river side</td><td>Environment
• policy</td><td>Environment
•poverty
• food security</td><td>Environment
•land speculation
•land tenure</td></tr>
<tr><td>Agronomy
• manual weeding</td><td>Agronomy
•soil fertility mgt
• disease & pest
• frost</td><td>Agronomy
•solid waste</td><td>Agronomy
• flooding</td></tr>
<tr><td>Economy
• available land
• market
• own labour</td><td>Economy
• input provision
• market shade</td><td>Economy
• market
• poverty reduction strategies</td><td>Economy
• land availability</td></tr>
<tr><td>Social
• motivation
• organization</td><td>Social
• training
• knowledge
• technical skill</td><td>Social
• HIV/AIDS reduction
• Youth initiatives</td><td>Social
• urban planners & policy makers knowledge</td></tr>
<tr><td rowspan="3">Small Scale Dairy Production</td><td>Environment
• peri-urban</td><td>Environment
• UA policy</td><td>Environment
• poverty
• food security</td><td>Environment
• land tenure
• waste removal</td></tr>
<tr><td>Husbandry
•better breed
•small scale</td><td>Husbandry
• quality feed
• disease</td><td>Husbandry
• intensive mgt
• waste treatment</td><td>Husbandry
• lack of space</td></tr>
<tr><td>Economy
•market
•family labour</td><td>Economy
• input provision</td><td>Economy
• market
• high demand</td><td>Economy
• feed source</td></tr>
</table>

Table 4.1: Conti.,

	Internal Forces		External Forces	
	strengths	weakness	opportunities	threats
	Social • farmers motivation	Social • training	Social • employment • Youth initiatives	Social • Planners knowledge • bad attitude
Small Scale Egg Production	Environment • peri-urban	Environment • UA policy	Environment • poverty • food security	Environment • land tenure • waste removal
Small Scale Egg Production	Husbandry • better breed • small scale	Husbandry • quality feed • disease load	Husbandry • Intensive mgt • Waste treatment	Husbandry • bad smell to neighbors
Small Scale Egg Production	Economy • market • family labour	Economy • input provision	Economy • market • high demand	Economy • feed source
Small Scale Egg Production	Social • motivation • organizations	Social • knowledge • skill	Social • employment • Youth initiatives	Social • Planners knowledge • bad attitude
crop-livestock production	Environment • rural setting • biodiversity	Environment • UA policy • rural policy	Environment • food security	Environment • land tenure
crop-livestock production	Husbandry • feed source • Integrated	Husbandry • quality feed	Husbandry • Improved technology	Husbandry • available land
crop-livestock production	Economy • market • family labour	Economy • input provision	Economy • market	Economy • feed source
crop-livestock production	Social • motivation	Social • training	Social • employment • livelihoods	Social • planners knowledge • industry & service sector development

The environmental, economical and social elements were analyzed, in reference to the main components of agricultural practices such as the land use, small scale vegetable production, small scale dairy and egg production and mixed crop-livestock production in the district.

Two blocks were identified from the SWOT table, which is block of the internal forces (strength and weakness) and the external forces (opportunity and threats). Thus, from the internal forces block; it was identified that: availability of the relatively better public open

spaces, good market and labour availability, good motivation and organization of district farmers as strong points; while lack of policy measures, poor land use and fertility management situation, poor extension and input provisioning services were identified as weakest points in the urban agriculture and land use system.

from the external forces analysis, it was identified that: poverty reduction and food security initiatives, youth initiatives, HIV/AIDS and employment reduction initiatives, population increment, availability of more solid waste, adoption of intensive agricultural production system, and increasing demand for livestock products as an opportunity; while planners knowledge and awareness level, bad attitude in some sectors of the society, lack of sustainable input provisioning system, temporary lad tenure system, as well as fast growth in industry and the service sector were identified as threat for sustainable UA and land use scenarios in the district.

From this SWOT analysis, it was understood that stakeholders have different perceptions and understandings concerning urban agriculture situations. Most farmers mentioned the advantage of UA as sources of income and food at household level, while they were mentioning the land use situation and poor extension services as most important drawbacks for sustainable urban agriculture practices. However, other stakeholders were focusing on the advantages of UA for food security and poverty alleviations as a whole and they mentioned lack of urban agriculture policy issues as a drawback.

After a participatory identification of the four categories of the SWOT, practicality should be based on the project stakeholders and or any practitioner of this tool that needs to be careful of the harmful factors through trying to diminish the weakest points and taking care of the external threats that might happen or exist currently. In the case of helpful factors, the practitioner or stakeholders needs to be aware of, how long are the strong points continue to be strong and continually searching external opportunities available to be tapped for the well fare and for the effectiveness of the UA system.

4.3. Force Field Analysis

After SWOT Analysis, lists of supporting and hindering forces that affect urban farmers in achieving their goals were compiled mainly from the SWOT result and situation analysis based on stakeholders opinion and suggestions. These forces were then discussed by

district stakeholders in the workshop facilitated by the student. Each force was weighted by workshop participants with the scale of 1(weak) to 5 (strong) with a questionnaire (annex VII).

In addition, the workshop participants were also asked to make any additions or subtractions on identified forces, and this activity helped to co-create knowledge with stakeholders. The major driving and hindering forces actually, had been identified from the SWOT analysis, however, the force field analysis helped to prioritise them based on their level of importance. The result of the process and ratting by stakeholders are tabulated below.

Table 4.2: District stakeholders ratting in driving and restraining forces

Forces	Rating, 1(weak) to 5 (strong)					
1. Driving forces	1	2	3	4	5	Average
• market availability	-	2*3	3*4	4*2	5*1	3.1
• labour availability	-	-	3	20	20	4.3
• employment needs	-	-	6	16	20	4.2
• farmers motivation	-	-	6	8	30	4.4
• poverty reduction and food security	-	-	6	4	35	4.5
2. Restrainig forces						
• lack of land and temporary land	1	2	3	16	15	3.7
• input access (seeds, fertilizer, feed)	1	6	9	4	10	3.0
• improved farm equipments	1	8	9	4	10	3.2
• urban planners and policy makers	1	2	3	12	15	3.3
• farmers skill and knowledge	3	2	6	8	10	2.9
• market shade access	3	4	6	8	5	2.6
• fast growth in industry and service	-	2	3	12	25	4.2
• public health issues	2	6	-	8	15	3.1

Ten stakeholders had given their opinion, which was multiplied by the level of ratting and added to be divided by the number of stakeholders to get the average value. Thus, according to the district farmers and other stakeholders rating using the force field analysis, it was indicated that: growth in industry & service sector, lack of land and temporary availability, urban planners and policy makers knowledge, lack of improved farm

equipments, input access, farmers skill and knowledge, public health issues and market shade access respectively were identified as restraining forces for the success of UA in Addis Ababa. On the other hand, it was indicated that poverty reduction and food security initiatives, farmers motivation, market availability, employment needs and available labour force, were identified to be the major driving forces respectively.

Force Field Analysis- Using Kurt Lewin Model

Driving Forces	Hindering Forces
(positive forces for change)	(obstacles to change)

Poverty reduction & food security initiative → Growth in industry & service sector ←

Farmers motivation → Lack of land & temporary availability ←

Labour availability → Planners & policy makers knowledge ←

Present state of urban agriculture and land use

Lack of Improved farm equipments ←

Input access (seed, fertilizer etc) ←

Employment needs → Public health issues ←

Farmers skill & knowledge ←

Market availability → Market shade access ←

Figure 4.2: Force field analysis showing the driving and hindering forces

4.4. Stakeholders Analysis

From the stakeholders analysis, the following questions were answered: who were the most important stakeholders (from a power and leadership analysis); what was the stakeholders' knowledge on UA program; what was the stakeholders' positions to or against UA program; what possible advantages or disadvantages the stakeholders assumed from UA program (interest analysis); and which stakeholders might form alliances (alliance and position held analysis).

4.4.1. Power and leadership analysis (Who are the most important stakeholders)

This prioritization is based on actual data and focused on a more selected group which allows managers to focus resources on addressing the concerns of the most important of the priority stakeholders. The "importance" of stakeholders is their ability to affect the implementation of the UA program. Since power and leadership are the characteristics that determine a stakeholder's ability to affect or block the implementation of a policy or program, therefore, these two characteristics are the basis for stakeholders' analysis (Kammi, 1999).

Power: refers to Quantity of resources (financial, material or human etc) the stakeholder has and the ability to mobilize those resources for or against UA program. Thus, power was calculated from a combined measure of the amount of resources a stakeholder has (H1, annex VI, in stakeholders table) and his or her ability to mobilize (H2), then, the two resource scores averaged, resulting in a power index between 3 and 1: 3 - high power, 2- medium power, and 1- little power. While **Leadership** considers the willingness by the stakeholders to initiate, begin or lead an action for or against a program Webster (1984, cited in Kammi 1999).Thus, the stakeholders either posses or lacks this characteristic. This is represented with "yes" or "no (annex VI, in stakeholders table). Based on these characteristics, all the priority stakeholders were divided in to the following four groups: those who have leadership and high power (group 1), those who have leadership and medium power (group 2), those who do not have leadership but have high to medium power (group 3) and those with no leadership and low power (group 4).

Table 4.3: Results of stakeholders analysis based on the power and leadership ability (Annex VI)

Groups	Selected Stakeholders
Group 1 those who have leadership and high power (level above 2 or 3)	• ENDA Ethiopia • USAID Urban Garden Program • Office of Agriculture in Addis Ababa City • Emanuel Development Association • Regional and District SMEs offices • Addis Ababa Environmental Protection Authority • City Plan and Information Agency • District Land Administration and authorization Office • District Council
Group 2 those who have leadership and medium power (level 2)	• Sub city and District Agricultural Offices • District health Office • Addis Ababa Water and Sewerage Authority • Sanitation and Beautification Authority
Group 3 those who do not have leadership but have high to medium power (level 2 or 3)	• Ministry of Agriculture
Group 4 those with no leadership and low power (level 1)	• Ethiopian Society of Animal Production • Ethiopian Forestry Society • Horticultural Society of Ethiopia • Ethiopian Veterinary Associations

4.4.2. Stakeholders knowledge on urban agriculture program

The stakeholders' level of knowledge related to a policy or a program also is often of interest to policy makers and managers. The level of knowledge can be presented as a general conclusion, especially if it is similar for the majority of the stakeholders, or the stakeholders can be divided by their level of knowledge: 3, 2, or 1 (Kammi 1999). Identifying stakeholders based on the knowledge level is important in order to devise a communication strategy to those of the lowest knowledge level. In this analysis stakeholders were identified to be categorized in to two groups. Those with the highest

knowledge level (3) and those with medium level (2). This shows, there is no stakeholder identified with the lowest knowledge level (1) on urban agriculture.

Moreover; when knowledge level data was crossed with the power/leadership analysis, to see the importance of knowledge level on the leadership capacity of a low knowledge level stakeholders, it indicated low effect on leadership capacity on UA. Example, professional societies are under higher knowledge level in the analysis, but with no leadership and minimum power. This shows professional societies are knowledgeable and are willing to lead to or against UA program, however, they couldn't, due to resources limitations. The knowledge data was also cross- referenced with the position of the stakeholders to determine if those opposed to the UA program have a consistently low level of knowledge. The analysis identified, however, those that are under oppositions are within medium to higher level of knowledge (Annex VI). Stakeholders like Addis Ababa EPA, city plan and information agency, District land administration and authorization office, district health office and AAWSA can be mentioned in this category.

4.4.3. The stakeholders' interest and positions to or against Urban Agriculture program

These analyses include: identifying total number of supporters/opponents, importance of supporters/opponents, knowledge of supporters/opponents, advantages and disadvantages of UA program implementation to the supporters/opponents (interest analysis), knowledge of whether these supporters/opponents are internal (I) or external (E) to the organization leading the program. From this analysis, two groups of stakeholders were identified. Those who support UA, because of its advantage to food security, poverty alleviation, income source, employment generation and efficient resource utilization, but with little concern about the effect of UA on public health; those who oppose the present UA situation understand the role played by UA, however, they have more concern on the present situation of UA in the city, concerning public health, air pollution and inefficiency of the sector as compared to other businesses like industry and housing .

Therefore, after analyzing the interest and position of stakeholders to or against UA program (using stakeholders table annex VI), thirteen of the eighteen stakeholders lie under supporters, while five of them under opponent groups as tabulated below.

Table 4.4: Interest and position analysis towards UA program

Name of supporters	Importance of supporters	Knowledge	interest analysis or advantage/disadvantage	I/E
ENDA Ethiopia	Group 1	level 3	Food security & income for poor family	E
USAID Urban Garden Program	Group 1	level 3	Food security,& income for poor family	E
Office of Agriculture in Addis Ababa City	Group 1	level 3	Food security, resource use, green area & urban life	I
Emanuel Development Association	Group 1	level 2	Food security & income for poor family	E
Regional and District SMEs	Group 1	level 2	Employment, income & food security	E
District Council	Group 1	level 2	Employment & income creation	E
Sub city and District Agricultural Offices	Group 2	level 3	Food security, resource use, green area & urban life	I
Sanitation and Beautification Authority	Group 2	level 2	Income, catchment protection and food	E
Ministry of Agriculture	Group 3	level 2	Food security & poverty alleviation, but health & traffic problem	I
Ethiopian society of Animal Production	Group 4	level 3	Economic & ecological benefit but has pollution	E
Ethiopian Forestry Society	Group 4	level 2	Economic & ecological benefit but has pollution	E
Ethiopian Horticultural science Society	Group 4	level 3	Economic & ecological benefit but has pollution	E
Ethiopian Veterinary Associations	Group 4	level 2	Economic & ecological benefit but has pollution	E

Table 4.5: Interest and position analysis against the present situation of UA program

Name of opponents	Importance of opponents	Knowledge	interest analysis or advantage/disadvantage	I/E
Addis Ababa Environmental Protection Authority	Group 1	Level 3	Economic & social benefit but UA is the cause of pollution and inappropriate land use in especially riverside buffer areas. Animal production also is the source of Methane and odour.	E
City Plan and Information Agency	Group 1	Level 2	Important for employment and food security but priority is given for industry and housing. UA has less comparative advantage than industry and housing except agro processing.	E
District Land Administration and Authorization Office	Group 1	Level 2	Important for employment and food security but priority is given for industry and housing. UA has less comparative advantage than industry and housing except agro processing	E
District Health Office	Group 2	Level 2	Has a role to supply balanced food, but is the cause of public health problem in inner city especially riverside vegetable production and inner city dairy production	E
Addis Ababa Water and Sewerage Authority	Group 2	Level 2	Green area, food & conservation but no priority	E

4.4.4. Alliance and position held analysis

According to Kammi (1999), possible stakeholder alliances can be identified from the stakeholders table (Annex VI) in two ways: first, by referring to the stakeholder table to see if stakeholders mentioned organizations that they can work with to demonstrate for or against the program; second, by referring to the position "clusters" (the stakeholders with similar positions). In addition, when the alliance information cross referenced with the position data, it can help to identify those alliances that may be potential sources of support, as well as those that may work together to oppose. These analyses can help to suggest strategies based on alliances, either to reinforce a potentially supportive alliance and devise a strategy to separate a potentially threatening alliance to convert them to supportive alliance. Thus, supporting alliances with stakeholders expectations and suggestions and opposing alliances with its concerns and suggestions were identified and tabulated below.

Table 4.6: analysis of potential supportive and opposing alliances

Potential sources of supportive alliances	Stakeholders' expectations in relation to the UA process	Suggestions for implementation of sustainable UA practices
• ENDA Ethiopia • USAID Urban Garden Program • Office of Agriculture in Addis Ababa City • Emanuel Development Association • Regional and District SMEs • District Council • Sub City and District Agriculture Offices • Sanitation and Beautification Authority • Ministry of Agriculture (medium supporters) • Ethiopian Society of Animal Production • Ethiopian Forestry Society • Horticultural Society of Ethiopia • Ethiopian Veterinary Associations	• sustainable UA • implementation of UA policy • efficient land and water use • increase the productivity of UA to play its role as income, food and other social functions using improved technology	All stakeholders participation The city master plan that considers UA and green areas as part of the city plan should be respected by planners and land implementers

Table 4.6: Conti.,

Potential sources of opposing alliances	Stakeholders' concerns in relation to UA process	Suggestions for implementation of sustainable UA practices
- Addis Ababa Environmental Protection Authority - City plan and Information Agency - District Land Administration and Authorization Office - District Health Office - Addis Ababa Water and Sewerage Authority	- Environmental pollution due to improper waste use - Public health problem due to unhealthy UA practices - Costly to use potable water for UA	- proper UA practice and city land use - land zoning for different sectors of activities - avoiding pollution - care for public health and water use

Table 4.7: Stakeholders who had not been included in the priority list but were mentioned by those interviewed as UA promoters

Public Sector Stakeholders	International Organization
- Dry Waste Management Agency- Waste Reuse Project - EPA - Jimma University, - Hawasa University - Addis Ababa University - MoWR	(SNV) - LAND O`Lakes International Development - PICDO - ESCO - ACDI/VOCA - CDC - ECI-Africa Consulting Pty Ltd - FAO - JECCDO Ethiopia - RUAF foundations

5. The Root Definition of Relevant Systems and Modeling

This is the step to move out of the "real" world into the world of systems. Here, the first step is to understand the concept of different perspectives that are possible to draw out of situation analysis including the rich picture. Checkland calls them Holon's - plausible relevant purposeful perspectives that can describe the real world activities (Williams, 2005). The relevant purposeful activities are those human activity systems that need to be in place, in order to transform the present situation to future wanted states. Each Holon provides a separate value base by which to evaluate the situation. Thus, in this analysis, it was possible to list many purposeful perspectives, however, addressing key perspectives separately, understanding their implications and then using those understandings in seeking to reintegrate these perspectives as a set of evaluative conclusions and suggestions for future action was the main target.

The next step is to select a particular perspective and put it through a very structured and rigorous model development process. That is developing root definition and it's CATWOE, where

- **C** customers who (or what) benefits from this transformation
- **A** actors who facilitates the transformation to these customers
- **T** transformation from "start" to "finish" what actually transformed from input to output
- weltanschauung what gives the transformation some meaning
- owner to whom the "system" is answerable and/or could cause it not to exist
- **E** environment that influences but does not control the system

    CATWOE is analysis tool, to organize thinking about the many roles and positions of individuals within the system described by the accompanying possible system description. Recently CATWOE changed to BATWOVE; where C is replaced with two concepts, B for beneficiaries and V for victims (The OR Society, 2012).

These activities were followed by the 3 E's which are tools to evaluate whether the system within the root definition would be efficacious[6], efficient[7] and effective[8] if implemented within the real world situations.

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[6] Whether the system does what it promises to do
[7] Whether the system functions using minimum resources

5.1. Possible Holons identified from District Urban Agriculture and Land Use System Analysis

- Increasing the productivity of UA to play its continuing role, as a sources of income, food and other social functions using improved technology
- Providing inspiring stories about urban agriculture rather than depressing stories that focused on few failures of urban agriculture.
- Creating efficient land use system in urban agriculture
- Creating efficient solid waste management practice
- Creating efficient urban agriculture water use system
- Practicing land zoning system for different sectors of economic activities
- Increasing stakeholders participation and harmony, in urban agriculture and land use system in the district
- The city master plan that considers UA and green areas as part of the city plan should be respected and implemented by planners and land use implementers
- Enhance farmers skill and knowledge in the district
- Improve market shade access to small scale vegetable producers so that not to discourage them in their business
- Increase planners and policy makers knowledge on urban agriculture and land use situations in the district
- Helping small scale vegetable producers in getting Improved urban agriculture equipments that helps in improving productivity of vegetables practiced in small areas
- Increased input access to small scale urban producers (seeds, fertilizer, foundation stocks for egg producers)

5.2. The Root Definition for some of the Relevant Perspectives of Urban Agriculture system

Root definitions identify "what" the desired system is, "how" it can be achieved and "why" it should exist. The root definition of a relevant perspective of a system as suggested by Checkland and explained in (Williams, 2005) is written in the form of "**A system to do X, by Y in order to do Z**"

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[8] Whether the system fits well with the long term goals

5.2.1. Description of possible systems

5.2.1.1. Improved technology

Creating a system of improved productivity in small scale urban agriculture and land use system by using improved technology in order to bring sustainable food supply and income sources for the district community and producers.

CATWOE

- Transformation: enhanced productivity from the existing situation
- Weltanschauung : this transformation is relevant because increased productivity makes small scale farmers more confident and continue on their practices
- Customer (B & V): district urban farmers and community will be beneficiaries
- Actors: government and non government organizations working in the district
- Owners: city, sub city and district office of agriculture extension services
- Environment: available technology, capital availability, awareness on UA and health issues that can be raised due improved input use and technology

Efficacious: This can happen when small scale farmers practice their farming by using improved technology than the existing ones, so that to increase productivity per small areas of land available.

Efficient: The system works with minimum resources as much as possible, because there is a relatively cheap family labour for urban farmers. Moreover, the envisaged technology is locally developed based on farmer's innovation (irrigation, seeds/foundation stocks, soil and water conservation system).

Effective: The system will fit with the long term goal of improving productivity, when it serves sustainable food and income sources for farmers and the community, that is, if it is applied as planned.

5.2.1.2. Providing inspiring news and stories

A system of stakeholders initiated lobbying of policy makers and planners by providing inspiring news and stories about the role of urban agriculture for food and income in order to support the implementation of urban agriculture policy and existing city master plan.

CATWOE
- Transformation: bad stories about UA replaced by good stories
- Weltanschauung: this transformation is relevant because good stories bring social awareness and change on UA and local food system
- Customer (B & V): district urban farmers and local community

- Actors: government and non government organizations working in the district
- Owners: city, sub city and district office of agriculture
- Environment: capital availability, established practice, fast growth of industry and service sector that needs more new acres of land

Efficacious: This happen when the system supplies enough inspiring news that will change people's opinion about the existing UA situations.

Efficient: The system needs more resources and it will be efficient when all interested stakeholders want to invest.

Effective: The system will be effective when it accomplishes its aim of influencing UA policy and the city master plan implementation. Then it fits well with the long term goal of all stakeholders.

5.2.1.3. Efficient solid waste management practice

A system of efficient solid waste management practice by helping small scale dairy producers to establish biogas production plant in order to bring sustainable energy use and waste removal system in dairy farms.

CATWOE

- Transformation: green energy production and proper dairy animals waste removal
- Weltanschauung : this transformation is relevant because proper waste removal can change bad views in the community and city planners about dairy production
- Customer (B & V): district urban farmers, local community and city planners
- Actors: government and non government organizations working in the district
- Owners: city and district office of agriculture, city energy office
- Environment: capital availability, farmers adoption to the new technology

Efficacious: When the system is able to use cow dung produced in the dairy farms and then produces enough energy for subsistence level consumption.

Efficient: It needs higher initial capital; however, it will pay back, in the long term of using the biogas plant. The present establishing capital rich up to (ETB 30,000), this is a huge capital for most small scale dairy producers, as dairy farmers explained.

Effective: The system fit well with the long term plan, when it accomplishes its aim of efficient waste removal and energy use system.

5.2.1.4. Sustainable extension services for small scale farmers

Establishing strengthened and sustainable input and extension services to small scale urban farmers by mobilizing interested and good leadership stakeholders in order to help farmers to practice urban farming sustainably.

CATWOE

- Transformation: changed input supply system from the existing sporadic and low capital input supply system that hampers production and productivity in UA
- Weltanschauung : this transformation is relevant because farmers are unable to produce as they expected, due to low input access and extension services that is discouraging scenario to continue their business
- Customer (B & V): beneficiaries (B) include district urban farmers, local community and city as a whole, but there might be impact on human health (V) due to excessive input use
- Actors: government and non government organizations working in the district
- Owners: city and district office of agriculture, AAEPA and city beatification agency
- Environment: capital availability, farmers adoption to the new technology and full participation of expected stakeholders

Efficacious: Helping farmers to continue farming and produce food and get income

Efficient: There are many stakeholders committed to help farmers in getting input, if stakeholders are mobilized strategically towards the goal. It will fetch good reward through increased UA production and productivity.

Effective: The system will be effective, when farmers produce sustainably and supporting themselves in the long term.

5.3. Developing the Conceptual Models of a Systems

The analytical tools in the previous stages have created the basic understandings necessary to construct conceptual models. The subsequent conceptual models serve as a way of expressing logically-derived ideas about what systems could be functioning in a system, based on what is stated in the root definitions (The OR Society 2012). The models represent an organized system of activities which could take place to reach the desired situation. They will be used in later stages as a basis for discussing what is really happening, and for finding ways to deal with the problematic situation.

Thus, as Checkland suggested, cited by Williams (2005), the following factors might be considered in constructing the models: a 7+2 activities of the same scale should be written in verbs of imperative to carry out the transformation in the CATWOE, rearranging activities to avoid overlapping arrows in the model and add a means of assessing performance, finally check whether the model shows some system properties like an ongoing purpose, a means of assessing performance, decision making process, components that interact and notions of subsystems.

Description of a Possible System

Creating a system of improved productivity in small scale urban agriculture and land use system by using improved technology in order to bring sustainable food supply and income sources for the district community and producers.

Core relevant activities:

Identify stakeholders who lead the process, decide on funding sources, select appropriate technologies, check on applicability, assess the interest of farmers, decide on farmers involved, check farmer's adoption, scale up the process, and check whether the system is efficacious, efficient and effective.
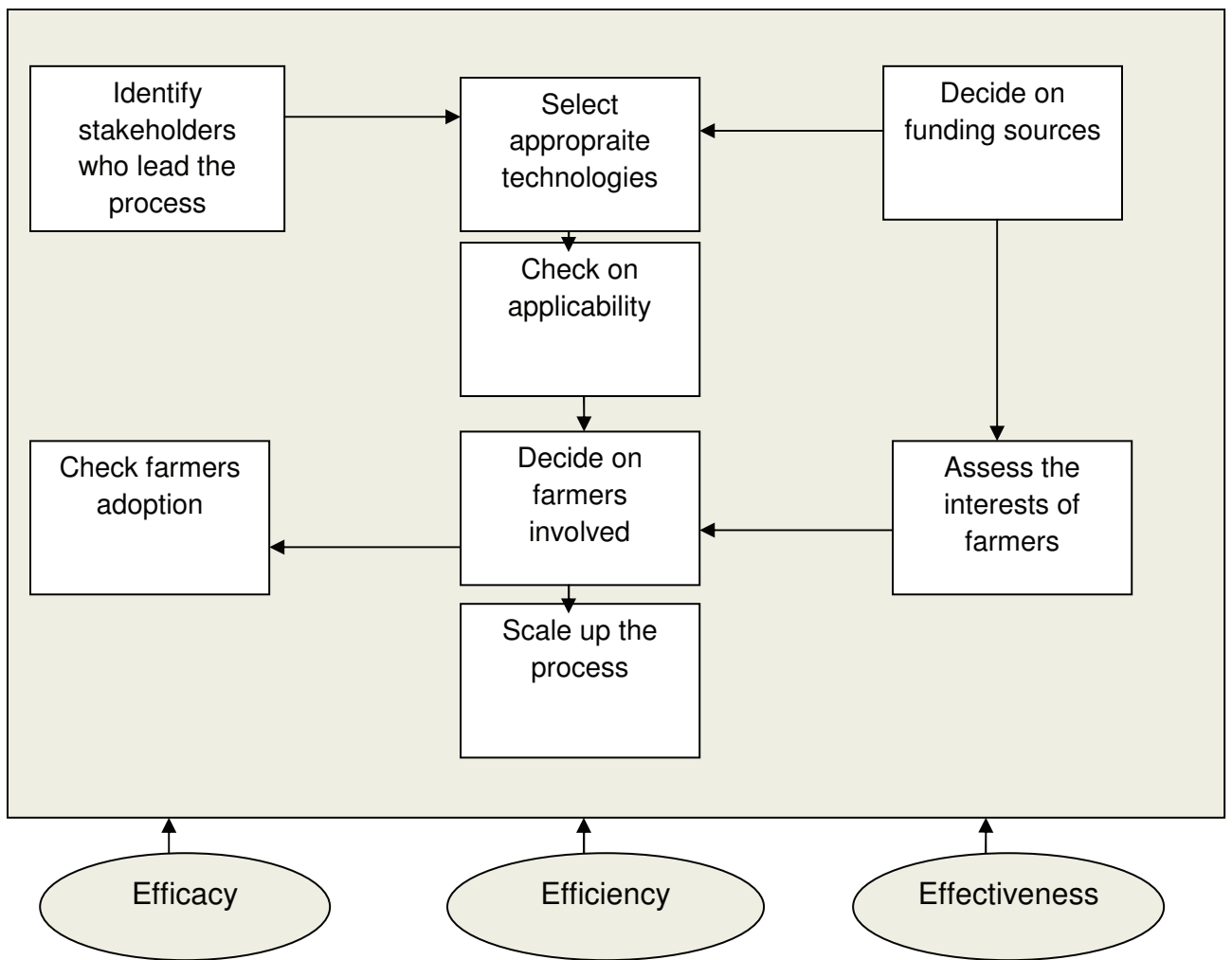
Figure 5.1: Conceptual model to improve productivity by using improved technology

Description of a Possible System

Stakeholders initiated system for lobbying policy makers and planners by providing inspiring news and stories about the role of urban agriculture for food and income in order to support the implementation of urban agriculture policy and existing city master plan.

Core relevant activities:

Identify lobbying stakeholders, develop relationships among lobbying stakeholders, decide on resources available, identify policymakers and planners needs, identify good stories, put it in policy makers and planners language, feed stories, get improved stories, determine any policy change needed, check whether the system is efficacious, efficient and effective.
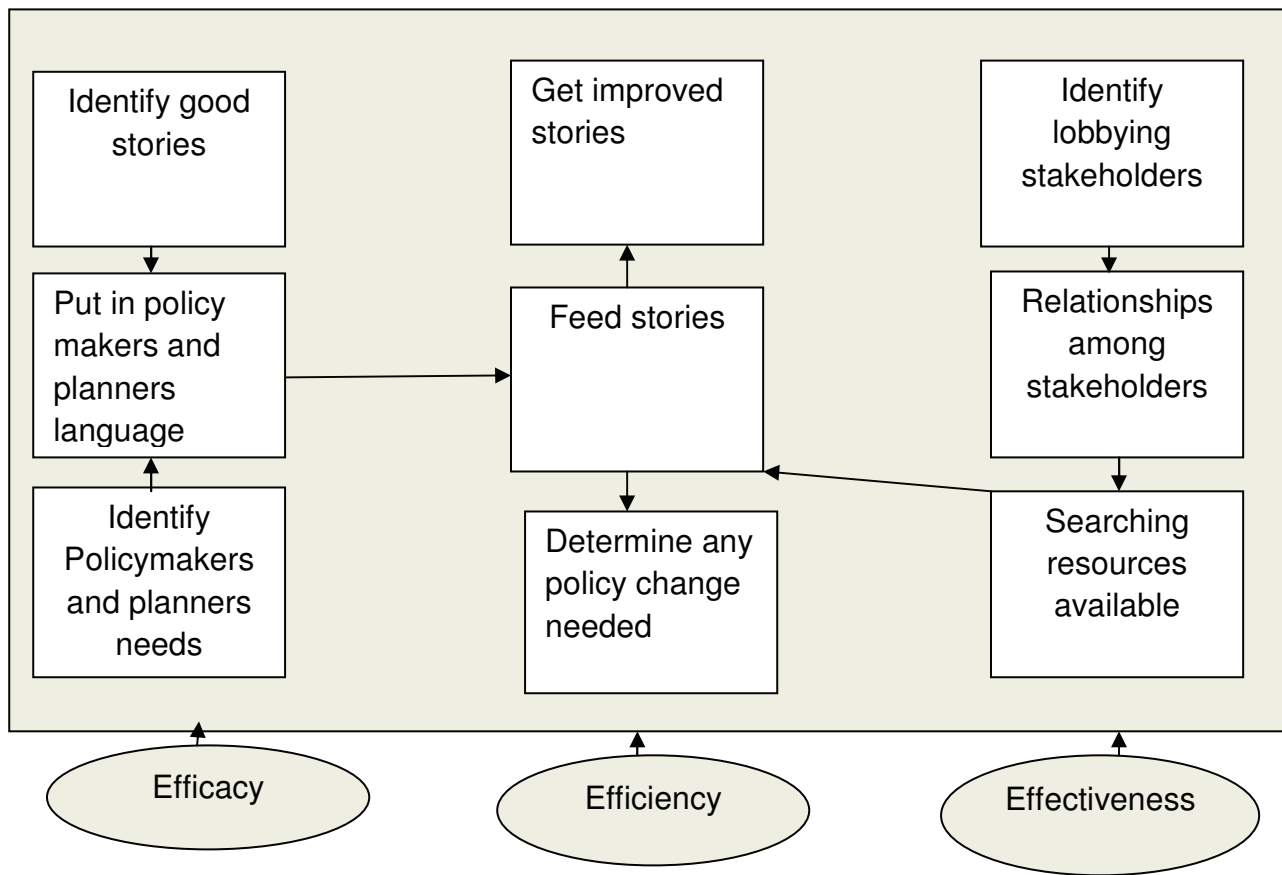
Figure 5.2: Conceptual model to provide inspiring news and stories for lobbying policy makers and planners

Description of a Possible System

A system of effective solid waste management practice by helping small scale dairy producers to establish biogas production plant in order to bring sustainable energy use and waste removal system in dairy farms.

Core relevant activities:

Identify interested, get biogas reactor design, determine finance sources, pilot test for applicability, get possible co-financing farmers, prepare working manual, arrange training for farmers, installation of the biogas plant, scale up of the system.
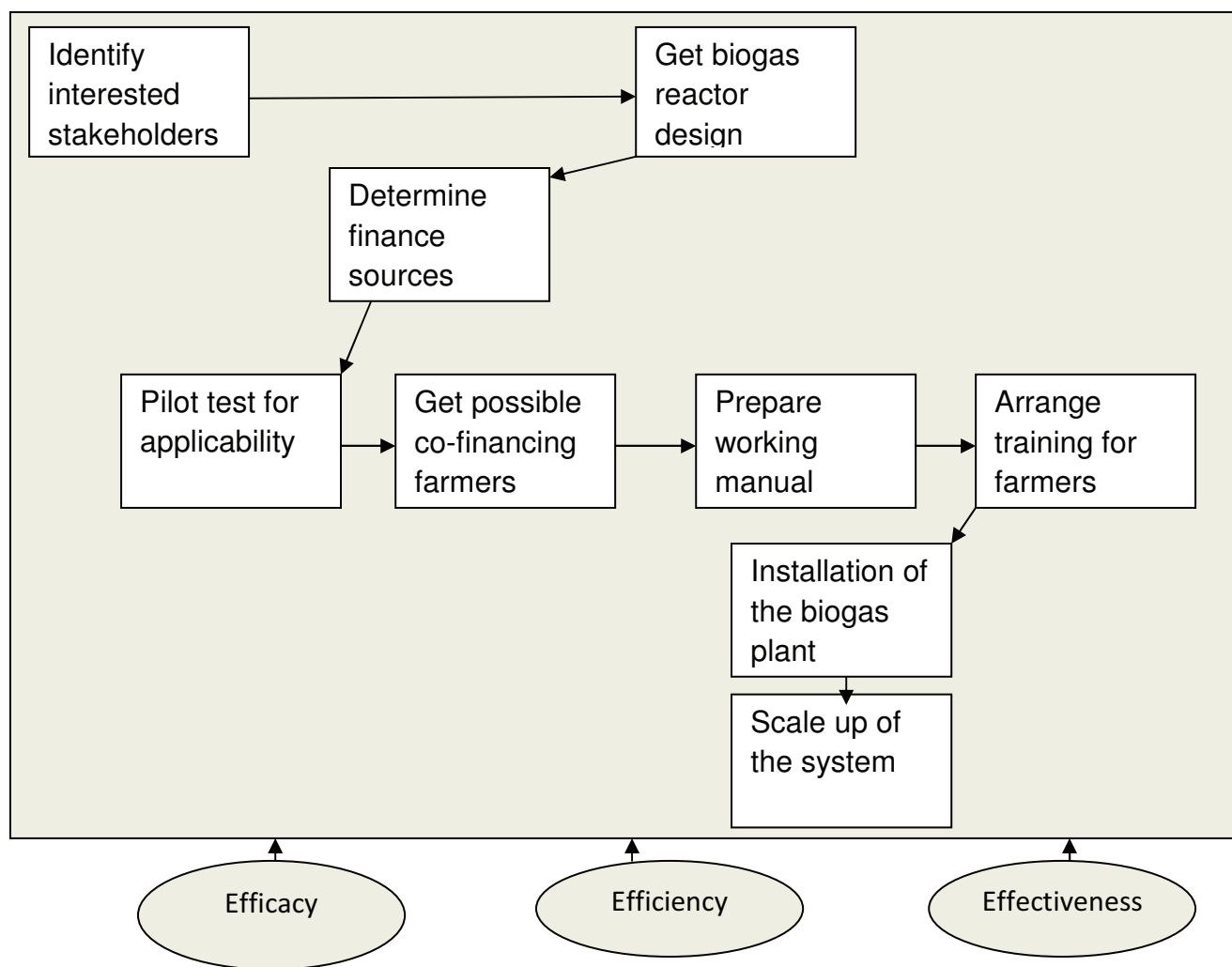
Figure 5.3: Conceptual model for effective solid waste management by establishing biogas plant

Description of a Possible System

A productive and sustainable UA system by establishing a strong extension provisioning system through mobilizing interested stakeholders in order to help farmers to practice urban farming sustainably.

Core relevant activities:

Identify responsible stakeholders, identify farmers extension needs, determine amount and possible sources of resources, create possible collaboration among stakeholders, decide on type of resources that the farmers may get, decide on possible stakeholders who own the system, design a system to determine possible gaps in working system, run the system as planned, scale up the system, check whether the system is efficacious, efficient or effective.
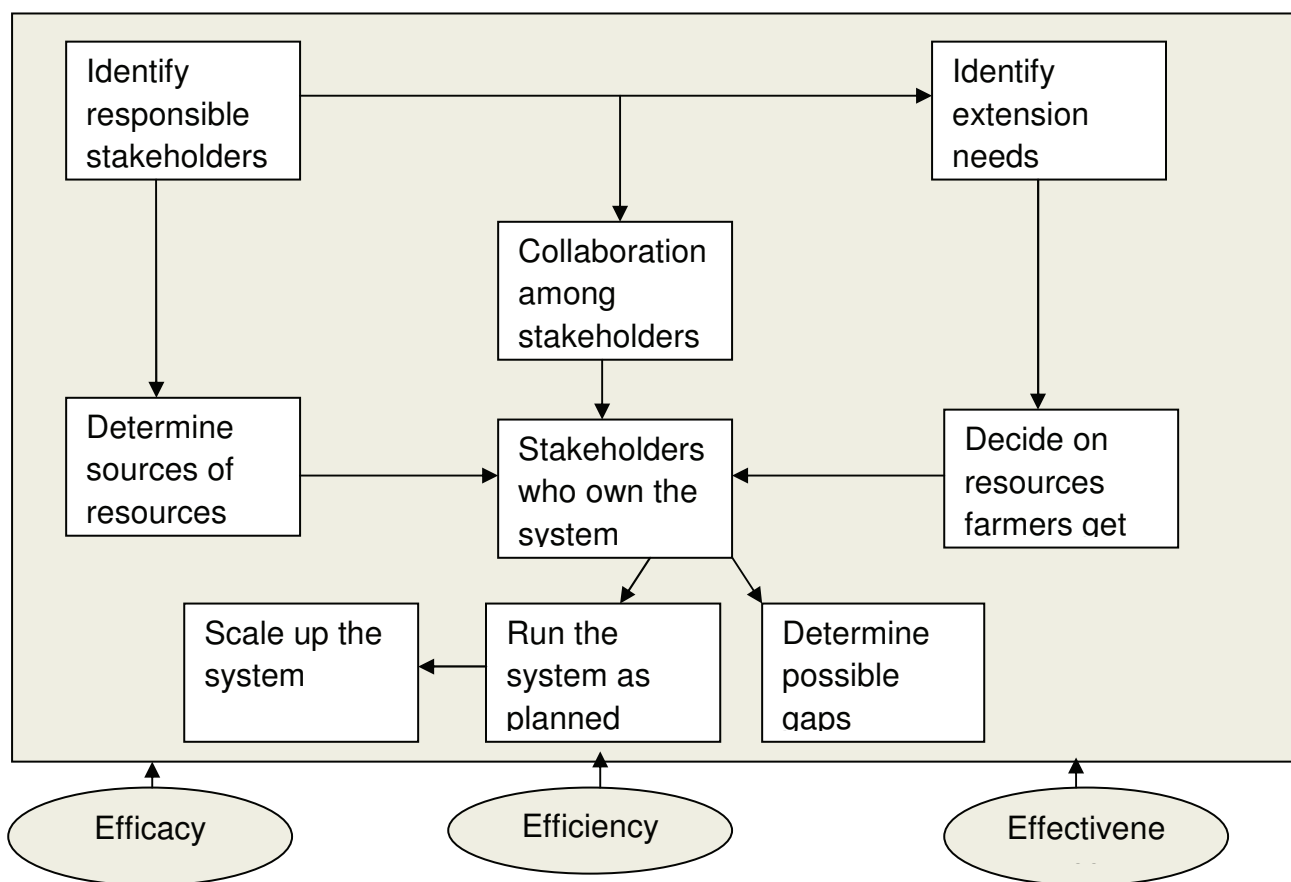
Figure 5.4: Conceptual model for establishing a strong extension provisioning system through mobilizing interested stakeholders

6. Conceptual Models Compared to the Real World Situations

In the previous discussion, on root definition and modeling, the situation was dealt within the conceptual world; however, in this step the real-world was compared to the conceptual models with relevant systems in order to assess their feasibility. The systems compared include:

- improving productivity of UA by using improved technology

- providing inspiring news and stories for lobbying policy makers and planners

- effective solid waste management system by establishing biogas plant

- establishing a strong extension provisioning system through mobilizing interested stakeholders

This step was used to get some insights by applying structured questioning of each activities of the model using a matrix approach. In addition, the comparison table used enables to check feasibility of the different activities within each model and to see how they occur in practice (Williams 2005) and it includes questions like: Does it exist in the real world? How does it behave? How is its performance identified and measured? Is this process any good?

According to the OR society (2012) using the comparison table at this step, enable us to check the feasibility of the different activities within each system and to see how they occur in practice. Therefore, the comparison table in this study clearly indicated: the possible questions to ask of people involved, possible courses of action, which might be taken to change the situation, the necessary changes which should be made to the model. Unfortunately, all the answers for the questions whether the "**Activity occurring in the real world or not"** are "yes", that indicates the possibilities of all the conceptual model activities to occur in the real world situation, if carried out in an organized manner as stipulated in the roots definitions.

6.1: Comparison table for improving productivity of UA by using improved technology

Conceptual Model Activity	Activity occurring in the real world?	How does it occur? Or how it is done?)	How is the output of this activity assessed
Identify stakeholders who lead the process	yes	From stakeholders analysis and needs assessment	Based on the number and interested stakeholders found to be involved to lead the process
Decide on funding sources	yes	From stakeholders analysis and by assessing amount of resources needed	Amount of resources guaranteed for the process
Select appropriate technologies	yes	By assessing possible innovative UA technologies	The number and effective technologies found
Check on applicability	yes	Assessing where, when and at what condition it works	Percentage of workable technologies found
Assess the interest of farmers	yes	By assessing who want to use which technology	The number of interested farmers found to be involved in the process
Decide on farmers involved	yes	By assessing who should participate in which technology	The number and know-how of UA farmers chosen to be involved in the process
Check farmer's adoption	yes	Assessing which technology is more feasible to farmers conditions	The number of technologies found to be effective in farmers conditions
Scale up the process	yes	By assessing how many new farmers are interested to involve in the process	The number of new farmers adopted the technology
Check whether the system is efficacious, efficient and effective	yes	By assessing the efficacy efficiency and effectiveness of the technology adopted and helped to improve productivity as mentioned in the CATWOE	The number of locally effective technologies, number of interested farmers to be involved to improve productivity of UA in the district

Table 6.2: Comparison table for providing inspiring news and stories for lobbying policy makers and planners

Conceptual Model Activity	Activity occurring in the real world?	How does it occur? Or how it is done?)	How is the output of this activity assessed
Identify lobbying stakeholders	yes	Through assessing interested stakeholders from stakeholders analysis	The number and leadership capacity of stakeholders found to involve in the process
Develop relationships among lobbying stakeholders	yes	By creating a forum among interested stakeholders	Forum established and its strength to carry out its duty
Decide on resources available	yes	Searching the required resources from responsible stakeholders	Amount of resources (money, knowledge, technology, decision power)
Identify policymakers and planners needs	yes	Through need assessment and stakeholders analysis	The quantity and quality of policy makers and planners needs and knowledge level identified
Identify good stories	yes	Through assessing good stories about UA	Number of good stories identified to feed for interested groups
Put it in policy makers and planners language	yes	Through interest assessment	The number and quality of documented stories
Feed stories	yes	Carried out through appropriate mass media, eg. news letter, radio, local television, workshops etc	The number and quality of stories fed to interested policy makers and city planners
Get improved stories	yes	Through receiving feedback to determine improved stories from interested groups	The quantity and quality of feedback received to improve the stories
Determine any policy change needed	yes	Through assessment of policy barrios	Number of policy barrios found to be improved in order to help policy makers and planners to fully accept UA implementation
Check whether the system is efficacious, efficient and effective	yes	Through assessment of the efficacy, efficiency and effectiveness of the stories developed and disseminated to help improve the knowledge and assumption of policy makers and planners for proper UA implementation as mentioned in the CATWOE	The number of policy makers and planners changed, amount of resource utilized based on the work accomplished, the continuity of the system implemented

Table 6.3: Comparison table for effective solid waste management in small scale dairy farms by establishing biogas plant

Conceptual Model Activity	Activity occurring in the real world?	How does it occur? Or how it is done?)	How is the output of this activity assessed
Identify interested stakeholders to work with	yes	By stakeholders analysis and needs assessment	The number and leadership capacity of stakeholders found to involve in the process
Get appropriate small scale biogas reactor design	yes	Through auction and in collaboration with interested stakeholders	The quality, feasibility and financial efficiency of prototype
Determine finance sources	yes	Searching possible finance from collaborating stakeholders	The amount of financial resources guaranteed
Pilot test for applicability on some farmers	yes	By assessing whether the design is working in small scale dairy farmer situation or not	The working efficiency and feedback from pilot test
Identify possible co-financing farmers	yes	By needs and capacity assessment of district dairy farmers	Number of interested stakeholders found to be involved in the process
Prepare working manual	yes	By reviewing literatures and knowing the skill and knowledge of stakeholders	The volume and quality of manual prepared
Arrange training for farmers	yes	By selecting possible time and place, trainees and trainers	Number of farmers trained to develop their skill and knowledge on the new technology
Installation of the biogas plant	yes	By allocation of appropriate farmer and based on the design	Number of farmers that adopt the technology to be installed
Scale up of the system	yes	By documentation and dissemination of good practices through all stakeholders participation	Number of farmers who adopted the technology through learning from good practicing farmers
Check whether the system is efficacious, efficient and effective	yes	Through assessment of the efficacy, efficiency and effectiveness of the technology adopted to help improve waste management situation and sustainable energy utilization in the district dairy farms	Quality of waste management, amount of resource utilized based on the work accomplished, the sustainability of the system implemented

Table 6.4: Comparison table for establishing a strong extension provisioning system through mobilizing interested stakeholders

Conceptual Model Activity	Activity occurring in the real world?	How does it occur? Or how it is done?)	How is the output of this activity assessed
Identify responsible stakeholders	yes	By stakeholders analysis	The number of responsibly participating stakeholders
Identify farmers extension needs	yes	Farmers needs assessment in training, input and other routine support systems	The number of farmers identified and grouped based on their needs
Determine amount and possible sources of resources	yes	Through assessment of possible sources with collaborating stakeholders	Amount of resources guaranteed for the cause
Create possible collaboration among stakeholders	yes	By forming a discussion forum for liaising stakeholders	Number of interested stakeholders determined to work together for their common interest
Decide on type of resources that the farmers may get	yes	Through assessment of farmers lack of resources in order to participate in possible extension services (eg input)	The amount and number of possible resource gaps filled
Decide on possible stakeholders who own the system	yes	Through assessment of responsible stakeholders (eg. district agriculture office)	The number and leadership capacity of responsible stakeholders who wanted to own the system
Determine possible gaps in a working plan	yes	By designing a monitoring and evaluation (MoE) plan	The number and quality of MoE documents produced
Run the system as planned	yes	By running MoE	The number of systems analyzed and fixed
Scale up the system	yes	By documentation and dissemination of good practices through all stakeholders participation	Number of farmers who are included in new extension system by learning from better practicing farmers
Check whether the system is efficacious, efficient or effective	yes	Through assessment of the efficacy, efficiency and effectiveness of the extension system employed to improve the productivity and sustainability of UA	Quality of extension services employed, amount of resource utilized based on the work accomplished, the sustainability of the system implemented

7. Scenario Description in District Urban Agriculture System

7.1. Land Use

In Ethiopia, land is a public property and an individual can enjoy only the use right of land under his/her possession. The major formal land delivery and tenure system in Addis Ababa is through the lease policy. Land provisioning by the lease policy include through auction, negotiation, lottery system and through an award. Moreover, the urban land policy gives priority to land allocation, and in this regard, order of priority is given to saving houses, social services, industry, micro and small business institutions, residential houses, commercial organizations and recreational centers (Gondo, 2009). This indicates that the existing land lease policy couldn't appreciate clearly the benefit of urban agriculture to food security, poverty alleviation and environmental management. However, land is also an important resource for urban agriculture. Urban farming requires some space, irrespective of whether the farming system is highly intensive which uses soil or not (Nigussei, 2010). Therefore, land remains a resource of concern to urban farmers. Thus, the only way to access land for UA in the study area in particular, is either through private land right as home garden or public lands such as open spaces, road sides and land along river sides. Urban open spaces are also available only on a temporary basis and priority is given for cooperatives that are organized under SMEs. In addition, there is a conflict of interest between environmental and agricultural land use along river sides. According to information given by AAEPA researchers, most of the river side areas in use today for agriculture, especially vegetable production, were actually reserved for buffer areas for environmental purposes such as tree plantation.

The long term land use system in Addis Ababa in general and in the study area in particular is therefore, not secured. This has discouraged farmers to plan for a longer-term investment and also limit the interest of farmers to conserve and develop their land for a longer term use. As one vegetable farmer in the district explained, "he had been interested to use chicken manure for improving soil fertility of his farm, however, he couldn't do it, because his plot of land is contracted for one growing season, which is from September to may, while chicken manure needs at least one year to be mineralized and available to be taken up by plant roots". Thus, the farmer idea is of course plausible, in that organic fertilizers have a long-term decomposition rate and their impact varies in accordance with

their carbon to nitrogen ratio, content of dry matter, as compared to Nitrogen, Phosphorus and Potassium fertilizers, which have a rapid effect, as the nutrients provided can be taken up by plants and microorganisms without further transformation processes (Baumgartner and Belevi 2001). This land use situation led farmers to a short term plan and has been given less concern to their land productivity and soil fertility management. Moreover, these days, the availability of land for individual farmers is minimal, unless farmers are organized under SMEs. Small scale dairy, egg as well as vegetable producers in the district mentioned scarcity of land is one of the major constraints that hinder the development of their enterprise. They are unable to get land to construct new shade and/or for proper waste removal. Thus, they couldn't scale up their farm. As it is observed in the field visit, many small scale dairy farmers' dry cow dung outside their compound on road sides in the urban centers, that is one source of conflict with district municipal authority.

In the discussion carried out with the major stakeholders such as city planning and information Institute, city land administration and District council officials, revealed that urban land for agriculture is allocated neither through lease, negotiation nor auction. It is allocated on temporary basis only for SMEs. In addition, as the district land administration officials explained, the availability of land, specifically along the river sides are challenged by flooding and are difficult to maintain by their capacity. These open spaces are, therefore, utilized only during dry season when the river water level becomes decreased, which otherwise would have been better to utilize two to three times a year. This also affects the total productivity of district urban agriculture.

The recent land zoning system (ORAMP, 2006), categorize city's land for different sectors of activities. This master plan specifically considered urban agriculture as part of environmental municipal planning and based on the master plan,12,176 ha (23.46%) of land is proposed for agriculture while 7,175 ha (13.82%) is proposed for forest plantation purposes. This makes the total land allocated for environment use to be 19,351 ha (37.29%) as discussed by Nigussei (2010). However, as the city's planning and information Institute explained, the master plan is simply a forecast and it is not implemented at all. Currently, agro-industry or processing is the only agricultural activity to get a piece of land at a permanent base in the whole city and the district land tenure system.

A study by Bryld (2002) indicated that a common phenomenon among many studies within the field of urban agriculture revealed by underlining on urban policy makers reluctance to engage in pro-urban agriculture policies. There is a general lack of flexibility among urban planners towards urban agriculture. This study further explained that, the UA practice is seen as not compatible with the modern view of the city's land use. These become particularly apparent in many African cities, where there is no direct law against urban agriculture, but the authorities use other laws, such as environmental and habitation laws, to act against the urban cultivators. This situation is found to be true in the case of Addis Ababa, where urban agriculture is not considered as a productive sector to bring sustainable development as compared to other sectors such as the industry and housing. Thus, there is a high demand for land within urban areas for, commercial, industrial, residential and institutional development uses that assumed agricultural land use as useless.

Therefore, In Addis Ababa, UA is facing several challenges that include severe competition with other sectors for land use. According to Nigussei (2010) the return per unit area of UA cannot be compared with industries and services, therefore UA is pushed to the periphery of the city, on temporary basis until other development ventures takes over. Urban agriculture cannot compete well against other uses of land, unless it is seen from the important role it has on the livelihoods of the urban poor and the function rendered by urban agriculture in waste management and other social impacts as discussed in the literature review.

If urban agriculture is to be continued through serving its role to urban food system and livelihood, it should be legalized and the envisaged master plan above should be implemented. These days, there is an encouraging initiatives in the district to include urban agriculture in to other programs aimed at poverty reduction, local economic growth, employment, urban youth initiatives, or managing HIV/AIDS at the community level through organizing and supporting the efforts carried out by NGO`s. If these initiatives be better incorporated to city's master plan implementation towards urban land use, UA can carry out its role in urban livelihood, waste management, and creating social harmony sustainably.

7.2. Urban Agricultural Practices

The urban agriculture practices in the district include horticulture, dairy, chicken and mixed crop livestock production system.The practitioners include individual farmers, cooperatives, small enterprises organized under MSEs. Urban agriculture is one of several food security options for households; similarly, it is one of several tools for making productive use of urban open spaces, treating urban waste, saving or generating income and employment, and managing freshwater resources more effectively Bakker et al. (2000, cited in Baumgartner and Belevi 2001). In line with this, the main objectives, in the district urban agriculture consist of food security, employment opportunity, sustainable resource management (eg. scarce land resource) and social objectives. Agronomic practices, soil fertility management, animal feeding, irrigation and urban planning are the processes that lead to get the main products in urban agriculture in the district, such as income, food, compost.

7.2.1. Horticulture

Urban horticultural practices, according to Baumgartner and Belevi (2001) differ in accordance with the production factors available. The most important factors for production are: land, water for irrigation, labour, capital, material, seeds, pesticides and herbicides, and fertilizer. For the district horticultural producers, all the production factors mentioned are crucial elements except irrigation water, where most of them use the all weather Akaki River without limitation. Water to the field is pumped out by generator or water diversion mechanism. Instead of water shortage, farmers complain about problem of flooding during the long rainy season locally called **Meher** rain (June to September). Moreover, lack of skill improvement training is among the elements raised as a limitation in their practices.

Horticultural crops such as potato, tomato, carrots, different kinds of cabbages (five varieties), onions (three varieties), and beet root, are major crops produced (see table 7.1 for local, common and botanical names). Most of these practices are carried out in open spaces along river sides by SMEs, cooperatives and individuals. In addition, there are Individuals who practice horticultural crops farming in their home garden using potable water. Here, two cases were selected in order to see the district horticultural practices

vividly, and to show the importance of individual home gardening and cooperatives in the sector:

Box 1: The Case of a family home garden

It is towards the center of the district, where a retired family of six has a home garden, having more than 20 species and/or varieties of horticultural crops, medicinal plants and tree shades in 120 m^2 area. It is the woman who does most of the gardening and support by husband. They use home produced waste as compost for the gardening. They grow vegetables like Cabbage (three verities), Selata, Kosta and Pepper; medicinal herbs in local names include Tenaadam, Besobila,Tejisar and Koso (see table 7.1, for common and botanical names); Fruits like Mango, avocado, papaya, zeyitun and false banana locally called Enset; tree plants in local names include Woyira, kitkita, tsigereda, zenbaba, Tsid, Yebeharzaf, yemefakiya enchet and elephant grass (see table 7.1, for common and botanical names). The family mentioned different roles of their garden, "as most vegetables used for home consumption as food, medicine and for sale, occasionally for gift to their neighbors". They also mentioned other purposes of their home garden as wind break and protect dust, good air circulation, recreational and exercise. Moreover, they also wanted to add chicken production within a short time period, however, not successful due to lack of good quality feed. They also have good knowledge in rotation and diversification of vegetables and compost preparation. They consider their business as a par time job and more productive activity eg. Cabbage harvested two times per month. They only mentioned cost of potable water as a bottleneck for the business. The cost of potable water became higher and higher from time to time after they started their home garden.

Box 2: The Case of Cholo Mothers (Locally called Yecholo Enatoch) Vegetable Cooperative

The cooperative started its business in 1994, however, it acquire its legality and was officially established in 2004 by 48 women members, who were either unemployed or a house wife. The cooperative was staggering with lack of capital and devastation of farm by flooding, due to this problem, many of the members lacked interest and abandon their membership.

Thus, it was in 2006, that the remaining 23 members reestablished the business with an added capital of 102,000 ETB loan, from the district government and EDA (an NGO working in the district to improve the lives of vulnerable children, youth and women through integrated community based and sustainable development).They have a plot of six hectare: four hectares vegetables, two hectares grass land. They grow potato, two varieties of cabbage, carrot and beet root. In addition, they have animals for fattening: donkey for transport, ploughing oxen and sheep. This season, they expect 500,000 ETB incomes from the sale of vegetables. All members work full time, in addition, during pick growing season, which is in between September and June, they hire daily laborer for harrowing and weeding and 50,000 ETB was expected running cost of the farm.

They make little effort using manure or compost for soil fertility management and they use different types of chemicals against vegetable crops worms. Major limitation is flooding during March and April and this period is most important harvesting time for few vegetables like potato. On the other hand, frost on vegetables and lack of skill improvement training were other problems, actually by acknowledging EDA`s effort towards skill development training. Eventhough, there are different marketing channels where products can be sold: saling to consumer, whole seller or to retailers, they are complaining about high transport cost and lack of their own market shade. Thus, they couldn't decide on price rather than accepting price decided by middle men who have their own shade and high market information. Previously, they were using animal driven cart to the nearby market, but this are prohibited by city officials by considering, this type of transport is out of dated for the developing municipal plan.

Table 7.1. Horticultural crops, medicinal plants and tree plants grown by district urban farmers

S. No.	Local Name	Common names	Botanical names
1	Avocado	Avocado	*Persea americana*
2	Besobila	Basil	*Ocimum basilicum*
3	Carrots	Carrots	*Daucus carota*
4	Chinise cabage	Cabbage	*-*
5	Zihone sar	Elephant grass	*Pennisetum purpureum*
6	Enset	False banana	*Ensete ventricosum*
7	Yehabesha Gomen	Cabbage	*Brassica carinata*
8	Yegurage Gomen	Cabbage	*Brassica oleracea*
9	Timatim	Tomato	*Lycopersicum spps*
10	Guaya	Grass pea	*Lathyrus sativus*
11	Misier	Lentils	*Lens culinaries*
12	Key sir	Beet root	*Beta vulgaris*
13	Kitkita	Sand olive/giant bush hop	*Dodonaea angustifolia*
14	Kosso	*Hagenia*	*Hagenia abyssinica*
15	Kosta	Cabbage	*-*
16	Mango	Mango	*Mangifera indica*
17	Nech bahirzaf	Equalyptus	*Eucalyptus globulus*
18	shinkurt	Onions/ faro, baro /	*Allium cepa*
19	Papaya	*Carica papaya*	*Carica papaya*
20	berbere	Hot papper	*Capsicum annuum*
21	Dinich	Potato	*Solanum tuberosum*
22	Selata	Letuce	*Lactuca sativa*
23	Shinbira	Chick pea	*Cicer arietinum*
24	Teff	Teff	*Eragrostis tef*
25	Tejisar	Palmarosa	*Cymbopogon martinii*
26	Tenaadam	Fringed rue	*Ruta chalepensis*
27	Tid	East African pencil cedar	*Juniperus procera*
28	Tsigereda	Rose	*Rosa sp.*
29	Sende	Wheat	*Triticum sp.*
30	Woira	Common olive	*Olea europaea*
31	Yeabeba gomen	Coliflower	*Brassica oleracea*
32	Yegermen selata	Letuce	*-*
33	Yemefakiya enchet	-	**Salvador Persica**
34	Zenbaba	Wild date palm	*Phoenix reclinata*
35	Zeyitun	Guava	*Psidium guajava*

7.2.2. Small scale dairy production

Although land is a serious constraint, urban dairy farming is practiced even in a very crowded section of the city (Nigussei 2010). Thus, dairy production is among the prominent urban agriculture sub systems practiced by smallholder individuals, SME, and commercial farms. This district is included in the peri-urban areas of the city, where there is a relatively better open space for grazing and farm establishment at different scale. Unfortunately, there are no large scale commercial dairy farms in the district. Dairying in the district is practiced mostly by individual dairy producers even in the center of the district, where there are crowded houses constructed tails to tail. Barn constructed just attached to the living house where they keep small number of animals mostly 1 to 4 milking cows and few replacement heifers and calves.

Intensive management practices such as stall feeding at homestead with concentrate and roughage feed, bought from feed industry as well as roughage feed producers. Most dairy farms have no space for grazing or green feed production as well as space for waste removal. Due to high feed cost, dairy farming is becoming unprofitable activity as compared to other urban farming. As observed in the field and sample dairy farmers interviewed, of the family members, only the man work full time, children go to school, the mother work at home, and then they help only at their spare time on managing the farm. Most farmers keep cross bred Holstein Friesian cows which can give more milk than the local ones. Artificial Insemination service supplied by the UA extension officers and /or private AI technicians.

Farmers use different marketing channels both formal and informal. Delivery to bigger milk processing industry through their milk delivery association is a common phenomenon. Though price per liter is lower than the informal market such as delivery to neighbors, café and other institutions, the cooperative marketing channel is more dependable and consistent. In the formal market, there is no limit to the amount of milk to supply; getting input services like feed; a lump sum is paid on 15 days time, after service charges are being deducted. Though there are opportunities in getting input and output market access in urban dairying, there are also some challenges as shortage of land, advisory and training service, high cost of poor quality feed.

Land as mentioned by dairy farmers is a serious problem for green feed production and also for manure removal. These days, some farmers started waste management using dairy manure for biogas production. Even though, its establishment capital is high (up to 30,000 ETB) and also has few technical difficulties; biogas production established in two small scale dairy farms observed fulfils fuel for cooking. However, the digester cannot produce fuel for lighting; this is due to inability of small scale farmer to obtain sufficient feedstock to feed the bio-digester unit to ensure a steady generation of biogas for lighting and cooking.

7.2.3. Small scale egg chicken production

According to Nigussei (2010), there are three types of poultry production systems in Addis Ababa: small scale traditional, small scale improved and large-scale commercial production systems. Small scale traditional and improved types of Chicken production systems are included in this study, because large scale poultry production is nonexistent in this district. Moreover, the small scale traditional system which is synonymous to the common rural poultry sub system in the country would be considered in the mixed crop livestock system below, as the system is mostly observed highly integrated with other agricultural activities.

In the most urban part of the district, the small scale improved type of chicken rearing for egg production purposes are a common practice. Most of them are group enterprises established by district SMEs. This small-scale intensive egg chicken production starts with a small number of (50-300) exotic day old chicks or pullets using relatively better management methods. Locally made wooden cage and litter floor, fenced with barbed wire are frequently observed chicken houses. Most chicken houses are attached to living house and few with separate shades. Genesis and Alema farms, the two big private companies which supply foundation stock to chicken producers in the district. Almost all chicken farms depend on purchased feed from feed processing factories. Moreover, some medicaments and vitamins bought from private drug vendors. Veterinary services are delivered by the sub city UA veterinary personnel and a limited service given by private veterinarians.

There are big variability in productivity and success among different farmers. Egg productivity reaches to 70 to 80% during pick egg laying period. This according to the respondent farmers depends on farmers experience in chicken management, and the

source of stocks and feed. Some companies who are the source of foundation stocks and feed have good reputation in their work. Thus, farmers connected to them became mostly successful. Alema as foundation stock and feed delivery company and GASCO for vitamin and medicaments were mentioned as a success story. Most farmers start raising chickens with limited experience or training; therefore, failures at the beginning in many farms are common, however, improvement has been seen as time goes on.

Farmers are supplying eggs to various institutions (University, Hotels, and Cafe), supermarkets, small shops and few on farm markets are common. The local SMEs coordination offices are important in market communication and integration. This farming practice has better integrated with other farming sectors, especially to local vegetable production. For example, chicken farm buy green vegetables like cabbage and tomato for supplementary feeding; while the vegetable farms buy chicken manure for soil fertility improvement. Like other farming practices, egg chicken rearing in the district has few difficulties that hinder sustainability of the sector. In this case, shortage of land and capital for expanding, shortage of reliable foundation stock, high cost but low in quality feed, and high disease prevalence are mentioned as major constraints in productivity and sustainability of the farm business.

7.2.4. Mixed crop-livestock production system

In a mixed crop livestock farming practices, crop and livestock production are integrated in such a way that Livestock mainly provides draft power and manure for crop production, while crop provides crop residues as feeds for the livestock sub-system. Thus the farmer has multiple objectives, including livelihood and income for subsidiary expenses. This type of farming is practiced bordering the rural areas. Individual farmers in this system, have relatively bigger areas of private land than the usual urban farmers, because they are recently included in the city map as city dwellers. Even as some of the farmers mentioned, they still are paying tax for bordering rural part of Oromia region. In addition, to the main cereal crops grown like wheat, teff, chick pea and grass pea (see table 7.1 for the common and botanical names).They also keep multiple species of livestock for different purposes, ploughing oxen, milking cows, few other animals like sheep and chickens.

In this case, the urban agricultural situation seems more of a rural type in its economical, ecological and social setting, except there is better access to market. Thus, crop agriculture is more of rain fed, while animal husbandry use natural breeding services in local or cross bred cows and let the animals to graze out in the field. A small number of local chicken ecotypes are also included in this system, where, low input output system, and periodic devastation of the flock by disease is common. The traditional practice is letting the chicken out to scavenge during the day time and back at night to a separate poultry house or the same house. There is no planned feeding of chickens, but scavenging is almost the only source of diet.

The level of awareness on natural resource management is minimal due to the limited service related to natural resource management and lack of confidence on the ownership of land (Nigussei 2010); however, few farmers use different soil and water management structures to conserve soil. The major ones includes cut off drain and diversion structures. In addition, they also plant trees such as eucalyptus and Junipers as a soil conservation method and source of income and fuel wood.

Agricultural development services include providing improved seeds, fertilizer (DAP and urea) and technical advisory services like farm visits, training and facilitation by the district agricultural extension agents. But, the respondent farmers mentioned that they are not satisfied due to untimely input provisioning and inadequate training and advisory services. Shortage of animal feeds and limited knowledge on improved livestock management technique were considered as major factors that constrained livestock development. In addition, the expansion of the city is also constraining UA by affecting long-term land development and expansion of farm lands. When farmers lose their land due to city expansion, while they have limited knowledge and entrepreneurial skills as city dwellers, which hinder in their involvement to engage on and become effective in city business.

8. Conclusion and Recommendations

Finding out about and describing of the urban agriculture and land use situation in the study area were made through a holistic understanding of the situation using **SSM**. Thus, the rich picture was drawn using a tree as a metaphor and helped to understand the major process, structures, environment, people perceptions and conflicts in UA. Consequently, the major factors either driving or blocking a movement towards a goal of urban farmers were identified by the **SWOT analysis** and then prioritized based on their effect by **force field analysis through** stakeholders ranking. Therefore, fast growth in industry & service sector, lack of land and temporary availability, the level of urban planners and policy makers knowledge, lack of improved farm equipments, access to inputs (seeds, fertilizer, feed, and foundation stock), farmers skill and knowledge, public health issues and market shade access were identified to be the major restraining forces. Similarly, it indicated that public sector poverty reduction and food security initiatives, farmer's motivation, market availability, employment needs and available labour force were the major driving forces respectively.

Through stakeholder analysis, the importance, knowledge, interest, position and possible alliances among the stakeholders on UA were identified. Thus, power and leadership are the characteristics that determine stakeholders ability to affect or block the implementation of UA program. Among eighteen priority stakeholders: nine of them (most NGOs, planning, agricultural and land administration offices) were those who have leadership and high power, four were those who have leadership and medium power, one stakeholder lie under those who do not have leadership but have high to medium power, whereas, the other four of the priority stakeholders were with no leadership and low power (most of the professional societies). Based on their level of knowledge, stakeholders were also analyzed into two groups: stakeholders in the first category were those with the highest level of knowledge, while those of the second category were with medium level knowledge. This analysis also indicated that resource availability, rather than the knowledge level is the most affecting factor to take a position to or against UA program. Thus, professional societies seem more knowledgeable and are willing to lead to or against UA program. Attributed to resources limitations, however, they have not engaged in it so far as expected.

Eighty percent of the stakeholders analyzed, lie their interest on the advantage of UA to food security, employment creation, income diversification, efficient resources utilization, poverty alleviations, and for better urban life situations in the city and thus are supporting the present situation. Most of the opposition groups also agree on the advantage of UA stated above, but with some concerns. According to the latter, UA is the cause of pollution and public health problem. Especially, vegetable production in riverside buffer areas and animal production in inner city areas are considered inappropriate land use systems. Moreover, some of the opposition groups (city plan and land administration offices) believe that UA has less comparative advantage as compared to industry and housing sectors. Possible stakeholder alliances were identified. Thirteen organizations are found to lie in supporting alliances and the rest five in opposing alliances.

Among thirteen possible relevant perspectives identified, only four of them were selected based on their importance in managing the major hindering forces. The possible systems described include: using improved technology; providing inspiring news and stories; creating efficient solid waste management system; and establishing sustainable extension services to small scale urban farmers. Four Urban farming practices, namely: horticulture, small scale dairy, small scale egg chicken production, mixed crop-livestock; and the land use scenarios in the district were identified and described for action.

According to the findings of this study, the following are some of the key question that requires further research. Different cases of agricultural practices should be studied in order to understand farming practices that are best suited and feasible to each part of the city. Stakeholders analysis should be conducted by including many stakeholders to come up with a more comprehensive result. Moreover, the relatively recent master plan and land zoning system in Addis Ababa considers UA as part of environmental municipal planning. Thus, it needs a system that makes use of stakeholders initiated lobbying of policy makers and planners in order to implement the envisaged master plan.

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Appendices

Annex I. Sample General List of Stakeholders

The following table illustrates general information on priority stakeholders interviewed, and participated at different steps in the data collection process with a justification for each group's inclusion in the analysis for the stakeholders' analysis as well as the district urban agriculture situation analysis.

Sector	Sub-sector and its questionnaires code	Internal/ external to office of agriculture in Addis Ababa	interviewed	Reason chosen/relation to UA
Regional/ political org.	Code 01 District Council-Manager	External	1	Council representatives have significant effects on urban policy design and implementations. Those interviewed are involved in the issues related to the topic. Consider UA as employment and income generation activity
Public entities: MoA & office of agriculture in Addis Ababa	Code 02 MoA – development partner linkage expert	Internal	1	At national level and its subsidiaries' MoA will be expected for planning and implementation of UA practices and projects. But at this time there is limited activity in UA except participation in city UA policy development and training for some interested groups. However, they believe, it has contribution to food security and poverty alleviation programs in city
	Code 03 Regional UA office-crop and livestock experts	Internal	2	They are responsible for designing and implementation of urban agricultural practices in the city. Providing monitoring and evaluation, input and technical. support services for farmers and subsequent UA officers in sub city and district. To produce more in small area with improved technology
	Code 04 Sub city and District UA officers		2	Implement the existing UA practices. Give day to day technical support to individual farmers and cooperatives
Public entities other than MoA & office of agriculture in Addis Ababa city	Code 05 Ministry of health (MoH)/district health office (health extension supervisor)	External	1	Responsible for issues related to pollution or public health hazard due to UA practices. Promote small scale UA for micro nutrient supplementation in public diet. However, they have opposition concerning animal agriculture in the urban center due to public health risk. For them UA is small scale agriculture useful for balanced diet and waste removal
	Code 06 City plan & Information agency (deputy head and expert)	External	2	Responsible for issues related to sustainable urban land development and use. They are also responsible for implementing the city master plan, but give priority to industry and service sector development than UA

Annex I: Conti.,

Sector	Sub-sector and its questionnaires code	Internal/ external to office of agriculture in Addis Ababa	intervie wed	Reason chosen/relation to UA
	Code 07 District land administration and authorization office head	External	1	Responsible for issues related to sustainable urban land development and use system (acquisition, availability and accessibility) at district level. Moreover, issues related to urban land market and property rights.
	Code 08 Water & Sewerage Authority: (production and distribution head)	External	1	Responsible for quality and sustainable urban water development and use including production, distribution and quality control. They believe that using water for UA is uneconomical and not faire at present city water situation, but promote farmers to dig their own wells 500m away from drinking water wells
	Code 09 Sanitation and Beautification Agency (research and design officer)	external	1	Responsible for beautification and managing open spaces and green areas development in the city. They are working in partnership with UA office, AAEPA, and dry waste administration agency for urban waste utilization. UA small scale agriculture for income generation, employment creation, food security
	Code 10 Addis Ababa Environmental Protection Authority (AAEPA)- researchers	External	3	They are working in research concerning biodiversity and ecological problems. They are also concerned about green infrastructures like parks, riverside plantations. Moreover, they recommend appropriate species for parks riversides. They believe urban agriculture can fit in urban planning, but they have reservation the present UA situation especially animal agriculture in the city center due to high methane emission and vegetable production by polluted river water.
Professional Societies	Code 11 Ethiopian Society of Animal Production (Chairman)	External	1	They deliver information related to their profession and networking. Produce technical input for policy makers about sustainable animal production and use.

Sector	Sub-sector and its questionnaires code	Internal/ external to office of agriculture in Addis Ababa	inter view ed	Reason chosen/relation to UA
	Code 12 Ethiopian Society of Horticultural sciences (Secretary)	External	1	They deliver information related to their profession and networking. Produce technical input for policy makers about sustainable horticultural production and use.
	Code 13 Ethiopian Society of Veterinary Sciences (coordinator)	External	1	They deliver information related to their profession and networking. Produce input for policy makers about animal disease and related public health.
	Code 14 Ethiopian Forestry Society-Chairman	External	1	They deliver information related to their profession and networking. Produce technical input for policy makers about sustainable forest plantations and natural resources use.
	Code 15 Micro & small enterprise agency (officer at regional and district SMEs office)	External	2	Organize small scale urban agriculture practsioners in different agricultural practices like vegetable production, chicken farming and beekeeping enterprises. Promote UA for the purpose of employment creation and facilitate open land for agriculture on temporary bases. Work on capacity practitioners capacity building
NGOs	Code 16 Environmental Development Action (ENDA Ethiopia)-coordinator	External	1	Promote household agriculture for nutrition supplement. They give technical, financial and material support to small scale urban farmers, focusing on marginalized group (women,PLWHAS) at family level
	Code 17 USAID Urban Garden Program (expert)	External	1	Promote small scale UA on land and above land techniques to supplement nutrion and income of families. Focus on orphan and vulnerable children and families. They provide technical support to families working on urban agriculture, based on no external input or organic principle. They also give technical, financial and material support to those government and non government organization working in UA sector. Moreover, they fully supported city UA policy development. Oppose practices that do not conform with their organization no external input principle.
	Code 18 Emanuel Development Association (EDA)-coordinator	External	1	Promote UA among the livelihood programs. They give technical, financial and material support to small scale urban farmers, focusing on marginalized group (women, PLWHAS, poor) at family level through integrated, community based, sustainable development program. Material support includes seed, equipment, beehive, cows and water pumps.

Annex: II.

Participatory Urban Agriculture Production System and Market Chains questionnaire for Urban Farmers and Food Market Actors at District Level
I. Production systems
A. Characterizing the Crop production Sub system
Type of crop grown in the area

 When do you grow the crops? Rain fed (Belg or Meher) or irrigated
  Which crops are important (major)?
       Why are they major?
       Why are others minor?
- Area coverage and productivity of each crop
- Agronomic practices
- Crop protection and post harvest handling
- Crop products and marketing
- Crop production services: seed, fertilizer, advisory, crop protection, market information , research
- Support service quality: good, averages, and best? Why?

Crop production and marketing constraint
B. Characterizing the livestock sub-system
     1. Livestock resources
          - livestock types/species, breeds, population
          - livestock holding and composition
2. Livestock management practice (by species)
   - feeding -grazing or tethering (type of grazing (communal Vs private), management of grazing
   - supplementation (type of supplementation if any, time of supplementation)
   - fattening (type of animals to be fattened, fattening ration, fattening time, length of supplementation)
   - feed production (type of feed produced, time of feed production)
   - watering management (source of water by season)
   - breeding/mating (controlled Vs natural)
   - housing (house type, animals housed together, in the living house or near it)
   - gender role (which member of house hold undertake which activities related to Ls)
3. Livestock waste management
4. Livestock and livestock products marketing
      - List of product obtained from Ls
      - Which is for sale and for home use?

Annex II: Conti.,

5. Livestock development services
- Health service, feed, AI, extension (type), research
- Is the overall quality of the existing service delivery good, averages, and best? Why?
- Livestock Production constraint

C. Natural resource management
- Water management
- Use of soil/water/waste resource
- Soil and water conservation including land use
- Forestry and agro forestry
- Constraint analysis
- Support service quality: good, averages, and best? Why?

D. Negative environmental and health impact experienced
On
- People
- Livestock
- Crop

II. Market chain (for the major products)
- Where do you sell what you produce (in each link of the market chain)
- What are the flows of the product (and by product) between different actors?
- Where and to what degree is value added (if any)

Actors
- Who are the main actors at each point in the market chain?
- Where they are located?
- What are their functions in the market chain?
- How do they relate one another? Are relations good, averages, and best? Why?

Product characteristics
- What are the volumes of production, monthly, annually?
- How much of the product is sold in the market, monthly, annually?

Business Development Service
- Who in each link of the market chain support you?
- How do they support you? What services do they offer (in each link of the market chain)?
- How is the quality of the service offered?

Annex: III

Semi Structured Questionnaire for Stakeholder Analysis in Urban Agriculture and Land Use System in Addis Ababa (Ethiopia)

Name of respondent/s: --

Institution:--

Address:---

ID No:--

Objective: this Questionnaire is prepared to identify and analyze the positions, interests, interactions and power relationships of key stakeholders of urban agriculture and its land use in urban and peri-urban areas of Addis Ababa. (Annex I show major stakeholders such as puplic entities, different levels of administration, professional societies and nongovernmental organizations to be contacted)

Introduction and the interview situation: the interviewer introduces himself to the person to be interviewd (interviewee) and give explanation about the objective and on the situation how the interview will be carried on.

I am MSc student in agroecology coordinated by two Eurpean Universities, University of Life Sciences in Norway and Isara_Lyon in France. I am conducting a study for the purpose of fullfiling the requirement for the MSc degree in agroecology. My study focusses on urban and peri-urban agriculture and it requires exploring the opinions of important actors and stakeholders in urban agriculture and land use sector. Thus it is crucial for me to obtain your opinion and that of your organization.The information obtained through these interviews will be for the direct use of the study, and will be presented in a thesis report to the concerned University with out identifying individual opinions and names.

A. We/I would like to ask you a few specific questions about your opinion regarding the
   implementation of appropriate urban agriculture and its land use system.
Your opinion on:-
1. Have you heard of urban agriculture?

2. If so, how did you hear?

3. What do you understand by urban agriculture mean?

4. What are the potential benefits to you and your organization of the establishment of appropriate urban agriculture situation in the city?

5. What are the potential disadvantages to you and your organization of the establishment of appropriate urban agriculture situation in the city?

6. Which of these categories best describes your opinion on the present use of city land for agriculture purposes?
   a) I strongly support it

    b) I somewhat support it

    c) I do not support nor oppose it

    d) I somewhat oppose it

    e) I strongly oppose it

If stakeholder answers a, b, or c, continue below. If stakeholder answers d or e, pass to question No 10.

For those who answer "a,""b," or "c" to question No 6:-

7. Which of the following aspects of UA do you support?

    a) Food security, livelihood and survival strategy for poor community

    b) Efficient resource utilization (land, energy)

    c) Increase the quality of life for urban population

    d) Part of green zoning system

    e) Prioritize

    f) Other

_____

8. For those aspects of UA that you do support,

    8.1) In what manner would you demonstrate this support?

    8.2) Would you take the initiative in supporting UA, or would you wait for others to do so?

    8.3) Do you have financial or human resources available to support this program?

    8.4) Which resources are available and how quickly can they be mobilized?

    8.5) Would this support be public?

    8.6) What conditions would have to exist for you to express this support?

    8.7) Would you ally with any other persons or organizations in these actions?

    8.8) Which persons or organizations?

9. Under what conditions would you choose NOT to support UA?

    For those who answered "d" or "e" to question No 6:

10. Which of the following aspects of UA do you oppose?

    a) Purpose of UA for food security, livelihood and survival strategy for poor community

    b) Efficient resource utilization (land, energy)

    c) Increase the quality of life for urban population

    d) Part of green zoning system

    e) The land tenure or legislation system

    f) The negative effect UA creates in pollution of water and soil resource

    g) The negative effect UA creates on consumer health

    h) Other

_____

11. For those aspects that you oppose:

    a) In what manner would you demonstrate this opposition?

    b) Would you take the initiative in opposing UA, or would you wait for others to do so?

    c) Do you have financial or human resources available to support this program?

    d) Which resources are available and how quickly can they be mobilized?

    e) Would this opposition be public?

    f) What conditions would have to exist for you to express this opposition?

    g) Would you ally with any other persons or organizations in these actions?

    Which persons or organizations?

12. Under what conditions would you come to support UA?

Annex III: Conti.,

B. We/I would now like to ask you a few specific questions about your opinion regarding others' opinions of the implementation of UA program.

Other Supporters:

13. What other organizations, departments within an organization or persons do you think would support UA? (Probe for agricultural and non agricultural organizations stakeholders)

14. What do you think these supporters would gain from the establishment of appropriate UA program?

15. Which of these supporters would take the initiative to actively support UA program?

Other Opposors:

16. What other organizations, departments within an organization, or persons do you think would oppose UA? (Probe for agricultural and non agricultural organizations stakeholders)

17. What do you think these opponents would gain from preventing the establishment of appropriate UA program?

C. Now I would like to ask you a few specific questions about your opinion regarding urban agriculture, land use and general food system

18. How do you perceive the encroachment of housing and industries in to the agricultural land in the periphery of the city? What do you think its effect on local food production and distribution?
19. Whose problem do you think is the inappropriate agricultural land use situations in the city, how? Want to know the cause or the victim?
20. Who will benefit from good agriculture and land use situation in the city, how?
21. How do you think then the farming and urbanization practiced with minimum conflict of interest in the study area?

Annex IV: The seven steps model of SSM (the OR Society 2011)

Monitoring & evaluation

1. The problem situation unstructured

Finding out

2. The problem situation expressed

Formulating desired situation

3. Root definitions of relevant systems

Building models

4. Conceptual models and scenarios

Evaluating models

5. Comparison of 4 with 2

Decision-making

6. Definition of feasible desirable changes

Taking action

7. Action to solve the problem or improve the situation

Annex V: Descriptions of stakeholders' characteristics (adapted from Kammi 1999)

A. I.D. No: given for the stakeholder on the questionnaire and sample general list of stakeholders in (Annex 1)

B. Position and organization: Position for the stakeholder in the organization that he/she works for.

C. Internal/External: (I) Internal —stakeholders that work within the organization that is promoting or implementing the program; all other stakeholders are considered external (E).

D. Knowledge of UA program: This column is divided into two parts. The first part, D1, is the level of accurate knowledge the stakeholder has regarding the program under analysis. This knowledge should be rated from 3 to 1: 3 – a lot; 2 – some; 1 – none. Final rankings should be reviewed to ensure consistent scoring among all of the stakeholders. The second part of the column, D2, is to record how each stakeholder defines the program in question. The information gathered in question #3 of the questionnaire should be noted here in the stakeholder's own words.

E. Position: Supports/Opposes/Neutral: Position refers to the stakeholder's status as a supporter or opponent of the program. The position of the stakeholder can be obtained by gathering information directly from the stakeholder (i.e., self-reporting); and through information gathered indirectly from other stakeholders or secondary information (i.e., others' perceptions). Thus, the reporting in this column represents the self-reported classification (column E1), the classification by others (column E2), and a final classification considering both (column E3). The position of the stakeholder should be reported from this final classification (column E3). Stakeholders who agree with the implementation of the UA program are considered supporters (S); those who disagree with the UA program are considered opponents (O); and those who do not have a clear opinion, or whose opinion could not be discerned, are considered neutral (N). Those who express some agreement, but not total agreement with the UA program should be classified as moderate supporters (MS). Finally those who express some, but not total, opposition to the UA program should be classified as moderate opponents (MO). Thus, in column E1, the position of the stakeholder as they state it in the interview should be entered (S, MS, N, MO, or O). In column E2, the position of the stakeholder as perceived by other stakeholders and/or from secondary information should be entered with a reference to the ID number of the person who stated that opinion. For example, S --19 would mean that stakeholder number 19 stated in his or her interview that the stakeholder under analysis would support UA program. In column E2, the position of the stakeholder as others perceive it should be entered (S, MS, N, MO, or O) with the ID number for each opinion. Lastly, in column E3, the final determination for the position of the stakeholder should be entered (after entering data from all interviews). This position should take into account the self-reported position as well as other stakeholders' opinions. S, MS, N, MO, and O can be entered in this column.

F. Interest: This refers to the stakeholder's interest in the UA program —or the advantages and disadvantages that the implementation of the UA program, may bring to him or her or his or her organization. Advantages and disadvantages mentioned by each of the stakeholders should be entered into this column in as much detail as possible, since the information will be used primarily in developing conclusions and strategies for dealing with the stakeholders' concerns.

G. Alliances: "a union or relationship" (Webster, 1984). Alliances are formed when two or more organizations collaborate to meet the same objective, in this case to support or oppose program

Annex V: Conti.,

Any organizations that are mentioned by the stakeholder in the questions related to this item should be entered in this column.

H. Resources: "a source of support or aid" (Webster, 1984). Resources can be of many types—human, financial, technological, political, and other. Thus it is considered the stakeholder's access to all of these resources. The resource category is divided into two parts: the quantity of resources that a stakeholder has within his or her organization or area, and the ability to mobilize those resources. The quantity of resources used as 3 – many, 2 – some, 1 – few and inserted into column H1 of the stakeholder table. Since this score is relative, final rankings should be reviewed to ensure consistent scoring among all stakeholders. The ability of the stakeholder to mobilize resources should be quantified in terms of 3 – the stakeholder can make decisions regarding the use of the resources in his or her organization or area; 2 – the stakeholder is one of several persons that makes decisions regarding the use of resources; 1 – the stakeholder cannot make decisions regarding the use of the resources. This score should be inserted into column H2. For example, if the stakeholder has personnel that work for him or her, it can be concluded that the stakeholder has the ability to mobilize these resources because he or she has direct influence over them.

I. Power: "the capacity or ability to accomplish something…strength, force or might" (Webster, 1984). Here, power refers to the ability of the stakeholder to affect the implementation of UA program due to the strength or force he or she possesses. Since "power" is defined here as the combined measure of the amount of resources a stakeholder has and his or her capacity to mobilize them, the two resource scores implied should be averaged, resulting in a power index between 3 and 1: 3 – high power, 2 – medium power, and 1 – little power. The final rankings should be reviewed to ensure consistent scoring among all stakeholders.

J. Leadership: "to direct the activity…to start, begin…front, foremost" (Webster, 1984). Leadership is specifically defined here as the willingness and ability to initiate, convoke, or lead an action for or against the UA program. The stakeholder either has or lacks this characteristic. This is represented with "yes" or "no".

Annex VI: Sample Stakeholders Analysis Table

A	B	C	D		E				F	G	H		I	J
ID No	Position & Organization	Internal or External	Knowledge		Position				Interest	Alliances	Resources		Power	Leadership
			D1 Level	D2 Definition	E1. Self	E2. Others	I.D / N o	E3. Final	Advantage & Disadvantage	Organization mentioned	H1. Quantity	H2. Ability to mobilize	Resources average	
		E	3, 2, 1		S, MS, N, MO, O	S, MS N,M O,O	N o	S, MS, N, MO, O			3,2,1	3,2,1	3,2,1	yes / No
01	District Council manager	E	2	Annex 1	S	-	-	S	Employment & income creation	03,04,07, 18	3	2	2.5	yes
02	MOA development linkage expert	I	2	"	MS	-	-	MS	Food security & poverty alleviation, but health & traffic problem	10 & 17 Others SNV, LANDO Lakes	3	2	2.5	no
03	City's Office of agriculture experts	I	3	"	S	S	all	S	Food security, resource use, green area & urban life	01, 04, 09, 15, 16, 17 & Others PICDO	3	2	2.5	yes
04	Sub city and district UA officers	I	3	"	S	S	01 03 07 18	S	Food security, resource use, green area & urban life	01,03, 15, 19 & Others ESCO, ACDI/VO CA	2	2	2	yes

[Type text]

Annex VI: Conti.,

A	B	C	D		E				F	G	H		I	J
ID No	Position & Organization	Internal or External	Knowledge		Position				Interest	Alliances	Resources		Power	Leadership
			D1	D2	E1. self	E2. others		E3. final	Advantage/ disadvantage	Organization mentioned 3,2,1	H1. Quantity	H2. Ability to mobilize		
		I	level	definition	S, MS, N, MO, O	S, MS N,M O,O	I.D	S, MS, N, MO, O					Resources average	yes
		E	1,2, 3			No					3,2,1	3,2,1	3,2,1	no
05	District health extension supervisor	E	2	Annex 1	MO	MO	03,04 11,12 16,18	MO	Balanced food, but public health problem in inner city	17	2	2	2	yes
06	City Plan Information Agency (deputy head & expert)	E	2	"	MO	MO	04, 07	MO	Employment and food security but no priority to UA	07,17	3	2	2.5	yes
07	District Land Administration & Authorization Agency-head	E	2	"	MO	MO	04, 07	MO	Employment and food security but no priority	01,04, 06	3	2	2.5	yes
08	AAWSA	E	2	"	MO	MO	03,04 11,12 16, 8	MO	Green area, food & conservation but no priority	16,17,	2	2	2	yes

[Type text]

Annex VI: Conti.,

A	B	C	D		E				F	G	H		I	J
ID No	Position & Organization	Internal or External	Knowledge		Position				Interest	Alliances	Resources		Power	Leadership
			D1 level	D2 definition	E1. self	E2. others	I.D	E3. final	Advantage/ disadvantage	Organization mentioned 3,2,1	H1. Quantity	H2. Ability to mobilize		
		I			S, MS,	S, MS	No	S, MS,					Resources average	yes
		E	1,2, 3		N, MO, O	N,MO, O		N, MO, O			3,2,1	3,2,1	3,2,1	no
09	Sanitation & Beatification Agency-research officer	E	3	Annex 1	S	-	-	S	Income, catchment protection and food	03, 10 & Others Dry Waste Management Agency	2	2	2	yes
10	(AAEPA-researchers	E	3	”	MO	MO	03, 11 14, 16	MO	Economic & social benefit but pollution	03 Others EPA	3	2	2.5	yes
11	Ethiopian Society of Animal Production	E	3	”	S	S	03	S	Economic &ecological benefit but pollution	03,17	1	1	1	no
12	Ethiopian Horticultural Science Society	E	3	”	S	-	-	S	Economic &ecological benefit but pollution	03,16,17 Others Jimma University	1	1	1	no
13	Ethiopian Veterinary Association	E	2	”	S	-	-	S	Economic &ecological benefit but pollution	03,17, Others FAO, CDC	1	1	1	no

[Type text]

Annex VI: Conti.,

A	B	C	D		E				F	G	H		I	J
			Knowledge		Position				Interest	Alliances	Resources		Power	Leadership
ID No	Position & Organization	Internal or External	D1 level	D2 definition	E1 self	E2 others / I.D		E3 final			H1 Quantity	H2 Ability to mobilize		
		I							Advantage/ disadvantage	Organization mentioned 3,2,1			Resources average	yes
		E	1,2,3		S, MS, N, MO, O	No	S, MS / N, MO, O	S, MS / N, MO, O			3,2,1	3,2,1	3,2,1	no
14	Ethiopian Forestry Society	E	2	Annex 1	S	-	-	S	Economic &ecological benefit but has pollution	03, Others EPA, MoWR	1	1	1	no
15	SMEs regional & district officers	E	2	"	S	03,11	S	S	Employment, income & food security	03,11,18	3	2	2.5	yes
16	ENDA Ethiopia - coordinator	E	3	"	S	03, 17	S	S	Food security & income for poor family	03, 17 Others FAO, RUAF	3	3	3	yes
17	USAID Urban Garden program-expert	E	3	"	S	03,04,05, 11,16, 18	S	S	Food security,& income for poor family	03,04,16 Others WFP, Pact JECCDO	3	2	2.5	yes
18	EDA-coordinator	E	2	"	S	04,17	S	S	Food security & income	04,15, ECI-Africa	3	2	2.5	yes

Page 86

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Annex VII
Stakeholders ratting in identifying driving and restraining forces in district UA & land use system
የአስቻይና ገቺ ሁኔታዎችን ለመለየት የተዘጋጀ መጠይቅ (በባለድርሻ አካላት የሚሞላ)
Stakeholders name/organization (የባለድርሻ አካላት/ድርጅቶች ስም)፡ --------------------------------,

1. Driving forces አጋዥ ሁኔታዎች	1	2	3	4	5
Market availability የገበያ አቅርቦት					
Labour availability የሰው ኃይል አቅርቦት					
Employment needs የሥራ ፍላጎት					
Farmers Motivation በከተማ ግብርና ለመሠማራት የሚታይ ፍላጎት					
Poverty reduction and food security initiatives የድህነት ቅነሳና የምግብ ዋስትና ፕሮጀክቶች					
If others ሌሎች (ካለ)					
2. Restrainig forces ገቺ ሁኔታዎች					
Temporary UA land tenure system ጊዜያዊ የመሬት አቅርቦት ሁኔታ					
Input access (seed, fertilizer, feed etc) የግብዓት አቅርቦት					
Improved farm equipments የተሻሻሉ የእርሻ መሣሪያዎች አቅርቦት					
Urban planners and policy makers knowledge የከተማ ፕላነሮችና የፖሊሲ አውጪዎች ግንዛቤ					
Farmers skill and knowledge የገበሬዎች ክህሎትና እውቀት					
Market shade access የገበያ ቦታ አቅርቦት					
Fast growth in industry and service sector የኢንዱስትሪዎችና የአገልግሎቶች እድገት ፍጥነት					
Public health issues የህብረተሰብ ጤና ችግሮች					
If others ሌሎች (ካሉ)					