

The organic approach to food production is considered by Ethiopian decision-makers as one which leads to poor yields, is backward and a reason for decaying farming systems. However, the reality is completely different.

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Hands on training on bio-intensive gardening for trainers

of trainers in Wolliso Town

The Living Garden

a Bio-intensive Approach to Urban Agriculture in Ethiopia

Food security by definition is a function of providing enough quality food or the ability to purchase food. Producing only cereals using chemical agriculture cannot satisfy these functions. Organic agriculture emphasises diversity and provides both enough and quality food which generates income to purchase other food. The diversity makes the option more resistant to problems of climate change, drought or flooding, vulnerability and poverty. It further provides the family with a year-round supply of food and income together with a year-round source of employment.

Ethiopia is blessed with natural resources conducive to organic food production. Its soils are fertile and living, and its water little polluted by salts and pesticides. Also, much traditional knowledge is available.

FACTORS CONTRIBUTING TO THE NEED FOR URBAN AGRICULTURE IN ETHIOPIA

Urban areas have become an important new frontier for food production both for urban and rural settings. As the population increases amidst shrinking farmland, the arable land per capita for producing food is becoming very small, and demands diversification and intensification of farms and gardens. The following factors contribute towards the need

for urban agricultural development in Ethiopia.

Ethiopia's present population is estimated at 65 million (CSA 2001). Figures indicate a fourfold increase in just 100 years. Farmlands are consequently fragmented proportionally to population increase. Today, farmlands in rural Ethiopia have been reduced to less than half a hectare per family, making it more of a gardening than a farming venture.

Two other forces that are putting pressure on the available land are city expansion and degradation. In Ethiopia, urbanisation has grown threefold in the past three decades (CSA: 2000). The economic and health problems resulting from malnutrition have caused great concern amongst planners and decision-makers.

That organic agriculture is a valid strategy for both stimulating economic growth and developing markets can be verified from my experience in promoting urban agriculture in three towns. Families in one town keep dairy cows either to supplement their meager salaries, or are totally dependent on milk and dung sales as their sole source of family income. In the other two towns, the main income source is the production of Irish potatoes and sweet potatoes together with a small amount of assorted vegeta-

bles, not only selling to local markets but also to markets within a 200 kilometer radius. In this way, organic agriculture in an urban setting can both be a tool for community building (health and vitality) and development (income generation and marketing of scarce nutritious food).

AVAILABLE TECHNOLOGIES (THE BIO-INTENSIVE GARDENING APPROACH)

The developing world in general and Ethiopia in particular badly need for technologies that are cheap, simple, locally resource-based and that can at the same time produce food sustainably. If we let the forces of nature function with little interference, the output can be very satisfying and we can let nature do the entire job.

Bio-intensive gardening is a method that capitalises on these forces of nature in all phases of development: growing, fertilisation and pest control. Below, I will primarily discuss the experiences gained at my workplace, which have focused on the bio-intensive gardening method. This method has four important components:

- ❖ production techniques;
- ❖ natural fertiliser techniques;
- ❖ natural pest and disease control techniques; and
- ❖ small-scale water harvesting techniques.

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The production techniques include:

- ❖ Biodynamic French Intensive method;
- ❖ FAITH gardening method; and
- ❖ container gardening methods.

The Biodynamic French Intensive Method

This method, according to Jeavons (1982) is a combination of biodynamic techniques developed in Germany, and the French intensive techniques developed in France.

The Biodynamic French Intensive method is a form of organic agriculture comprising three basic principles. The first principle is to grow plants so close to each other that when they mature, their leaves will just barely touch. This creates a situation in which the microclimate and the living mulch reduce weed growth and conserve moisture. The second principle is the use of raised planting beds (60 cm deep). These plots have loose soil that allows for air, moisture and warmth together with sufficient organic nutrients that help roots to properly penetrate the soil. The third principle is to feed the soil (and not the plant) by using organic fertiliser and natural methods of pest control. In short, the method is less dependent on expensive external inputs, is space intensive, water conserving, depends on family labour only, and creates minimal pest problems. Families practising the method are likely to have well-balanced nutritious food, a better income from products that are produced without risks.

The FAITH garden method

There are numerous organic wastes from our kitchen and gardens that are not recycled to produce more food. Such wastes include: weeds, grass, leaves, kitchen wastes (peels, organic refuse, eggshells), livestock manure, ash, hedge clippings, hair trimmings, chewed sugarcane, etc.

The FAITH method includes basket gardening to make use of these wastes to produce food. This technique keeps bottomless baskets on top of a hole (30 cm diameter x 30 cm depth) dug into the ground. All kitchen and garden wastes are dumped into the hole. At the same time, desired vegetables and fruits are planted about 20 cm away from the basket. Through their root systems, the plants extract moisture and nutrients from the fermenting waste. At the end of the process, the method produces organic food and fertiliser, conserves water and protects plants.

Container Gardening Method

Container gardening includes the use of barrels, tires, hollow blocks, plastic bottles etc. In a small garden, even a paved area can be used to grow a number of different crops. This generally means growing the plants in containers. Any wall or fence can also be useful.

A suitable container is anything that holds soil, as long as it meets the following requirements: not contaminated, provide ample room for roots and excellent drainage. Tomatoes, lettuce, onions, beans, strawberries and herbs are just a few of a quite extensive list of plants that respond well to container growing and will decorate your veranda, patio, window sills etc.

MANAGEMENT OF BIO-INTENSIVE GARDENS

Apart from the production techniques the bio-intensive garden practitioner needs to fertilise his plots, and apply pest controls and rational water use. The following

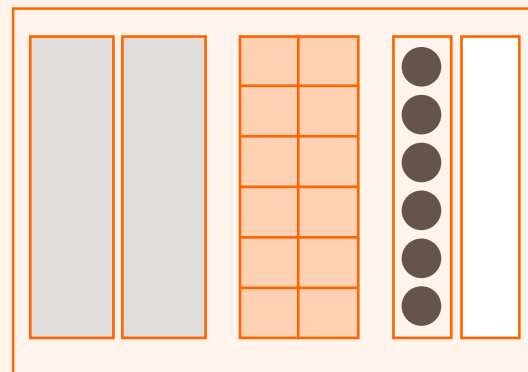
general statements enumerate the available choices.

Soil fertility





Sustaining soil fertility the natural way is the most important component in the organic farming/gardening strategy. There are a basket of choices of organic fertilisers that can be categorised as manure-based, legume-based or biomass-based. *Manure-based* fertilisers include aged manure, manure tea, earthworm casting, cow-horn manure, etc. The *Legume-based* fertilisers include intercropping with legumes (nitrogen-fixing-plants like peas, beans, leucaena, sesbania, etc.). *Biomass-based* fertilisers include compost (pit compost, heap compost, basket compost and container compost), stinging nettle manure, etc.

Additives like wood ash, bone meal, eggshells, etc. contribute greatly to organic fertilisation, by producing potash, phosphorus, calcium and iron if we allow the soil micro-organisms to work on them.

Figure 1: Bio-Intensive Garden Module



The components of the module include:

-  18m² Biodynamic French Intensive plots
 -  12m² FAITH garden units of 12 plots
 -  6m² Container garden units that combine tires, barrels, hollow blocks, ring culture and hydroponics.
 -  6m² Utility area (seedling production, pesticides, compost production, etc.)
- 28m² path

It is not a must for a family to adopt all the technologies included in the module. In areas where land space is not a limiting factor, the Biodynamic French Intensive Method is popular and highly productive. In areas where housing is highly congested, the barrel garden is popular, while the FAITH garden is popular in areas where there are plenty of organic solid wastes.

Several opportunities and constraints were recorded during the promotion of the bio-intensive garden venture, a few of which are discussed below. However, generally speaking the approach has been accepted as one means of food production and income generation addressing all sectors of the communities (women, youth, elderly, etc.) In the final analysis, the ventures can be seen as an important means of addressing community building and development.

Pest and disease controls

There are three approaches to keep pests and diseases at bay, in a natural way. The first step is to have a strong healthy plant growing in a healthy living soil that will be able to build resistance. Second is to fight harmful insects through beneficial insects and animals such as ladybirds, praying mantis, wasps, lizards, birds, etc. The third is to apply natural pesticides such as pepper, tobacco, pyrethrum, stinging nettle, etc.

Rational use of water

There are three major categories of activities aimed at the rational use of water. The first is harvesting water during the season of plenty, for use when water availability is being stretched - roof water harvesting, ponds and artificial lakes are some examples. The second is to conserve the available water (mulching, shading, precision planting, etc). The third is recycling water or reusing it for a second and third time depending on your previous use.

EXPERIENCES IN PROMOTING BIO-INTENSIVE GARDENING IN ETHIOPIA

Below is a description of the module developed on the basis of the experience I gained in my ten years of work in the promotion of urban agriculture in Ethiopia. Relying on the natural resource base, simplicity, affordability and productivity are the virtues to which the module is designed to respond towards greater sustainability, replicability and equity. To date, 800 families have participated directly in the training programmes on bio-intensive gardening. Replicability of the technologies amongst the communities is reported to reach 8,000 families. The trainees are a mixture of male, female, urban and rural dwellers. A typical module for the demonstration training plot is about 70 m² (see figure below).

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Policy environment

Illegal land occupation, use of contaminated downstream city rivers and the absence of urban agriculture in city planning were forces that have discouraged this venture in Ethiopia. However, through years of campaigning by environmentalists and agriculturalists, urban agriculture is now recognised by policy-makers and included in the master plan for over four cities and towns, and others are following suit.

Urban dwellers' dilemma

The majority of urban dwellers in Ethiopia shy away from working with the garden. This is because the activity is considered to be a job for the poor and uneducated. Education is considered as the means to avoid heavy farm drudgery. This is the number one problem we the promoters of urban agriculture encounter among the educated youth. However, there have been substantial changes in attitude after the training programme.

Market Problem

The market is a real problem in the Ethiopian rural setting as far as vegetables and fruits are concerned. This is due to accustomed diets being predominantly cereal-based, coupled with the products being perishable. The overall poverty situation contributes to poor consumption and production of food rich in micronutrients.

Replicability

The town of Ankober provides an example to illustrate the potential of replicability. Only ten members of the community were selected for instruction on training of trainers, and another 90 families were provided with inputs (seeds and tools). In just six months, the number of families practising bio-intensive methods reached 1,000. The most important reason for this is that people can believe it for themselves when they see the demonstration and practitioners' plots. The only expense is seeds as they already have tools. The income generated is substantial. All other inputs needed are locally found (fertilisers and pesticides, etc.).

School of Urban Agriculture

As mentioned above, training in the bio-intensive approach to urban agriculture began in Ethiopia ten years ago. Ever since then, several training sessions were

held that addressed youth clubs, women's clubs, pensioners' associations, extension agents, farmers, school teachers and students, NGO workers, etc. In all cases, the training sessions utilised little hands-on practical sessions for lack of permanent demonstration plots. Thus the need for establishing a school of urban agriculture surfaced, an idea supported by several NGOs and governmental offices (GOs). At present, the proposal for the initiative has been submitted to the government, identifying the site of the school as well as the technologies to be promoted (which are partially reflected in this article). The proposal also requested for legalisation of the school and is awaiting a favourable reply in the near future.

RECOMMENDATIONS

- ❖ An estimated 16 national and international NGOs and GOs in Ethiopia together with thousands of small gardeners all over the country have voiced their desire for a training school on urban agriculture. There are 18 such schools in Africa but none in Ethiopia. Such a school should be supported by government policy, strategy and action. (The author is deeply involved in these activities at present).
- ❖ Urban agriculture is accepted as a policy by the Addis Ababa city administration and even the city planning has included land set aside for the purpose. What is not well understood by the authorities, however, is the awareness of the potential of the organic option to urban agriculture and available technologies. Seminars, workshops and publications need to be organised to address this issue.
- ❖ The poverty eradication strategy of the country needs to include urban agriculture as among the important tools in the fight against poverty in urban areas as well as in the farmyard gardens in the rural areas.
- ❖ In general, strong support and attention towards the promotion of the bio-intensive gardening approach to urban agriculture will be an important step in addressing issues of hunger, unemployment and those pertinent to youth, women and vulnerable sectors of society. Equally important, urban agriculture's contribution to reducing poverty and unemployment can have important consequences in subsequent phases, ultimately helping in the fight against crime and disease.