
Oyster Mushroom Cultivation by Urban Youth in Addis Ababa As an Income Generating Activity



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Urban Centers - Key Global Facts

Urban populations: by 2030

- LAC – 75%; this will swell to 83%
- Asia and Pacific – from 37% to 53%
- Africa – from 38% to 55%

Globally

- 20 cities have > 10 mill people
- In 2000, 1.9 billion lived in cities of the DC.
- In 2030, this will grow to 3.9 billion

Currently, city and sub-urban farmers supply food to about 700 million city dwellers

Projection of Human Population in Ethiopia (million)

| | 2002 | 2025 | Increase |
|-------|------|------|----------|
| Total | 65 | 140 | 115.4% |
| Urban | 8 | 36 | 350% |
| | | | |

Addis Ababa

- Founded in 1886; Total land area = about 54,000 ha
- Population about 3 million; growing at > 5% PA
- About 33% households are women headed
- Unemployment – 47%, & 65% have no skills
- About 58% of the unemployed are female, highest among youth
- About 60,000 street children
- High dependency ratio – 69%
- Over 75% commercial sex workers infected with HIV
- Children < 5 years suffer from wasting (5%) and stunting (34%); under five mortality is 12%
- Produces about 400,000 tons of solid waste annually

Projected population and food demand for Addis Ababa

| Year | Popn (Mill) | Cereals (Mill tons) | Meat (Mill tons) | Milk (Mill litres) |
|-------------|------------------------|--------------------------------|-----------------------------|-------------------------------|
| 2000 | 2.40 | 5.6 | 0.53 | 115.6 |
| 2010 | 3.33 | 7.5 | 0.70 | 154.2 |
| 2020 | 4.25 | 9.6 | 0.89 | 196.7 |
| 2030 | 5.08 | 11.5 | 1.07 | 235.7 |

Institute for Sustainable Development (ISD)

- ISD recognizes the importance of involving young people in the development process, particularly in efforts that lead to poverty reduction and rehabilitating of the environment
- ISD, through its youth team, aims to help young people to get organized and support them to develop their skills and to improve their livelihoods in a sustainable manner
- In addition, ISD encourages organic urban agriculture for income generation, with particular focus on the youth and women

Characteristics of Youth Associations

- Are self-organized have legal entity and bylaws
- Committed to cause are desirable partners.
- Formed by themselves and others created with ISD support
- Characterized as out of school, jobless and without assets and money
- Most live with their parents
- The conducive factors for their group formation are:
 - From same schools; active members of school environmental clubs
 - Same age and mixed sex groups
 - Willing to work by self-employing themselves
 - Grouped themselves for collective action
- Have interest in environmental activities and urban agriculture
- Use environmentally friendly and cheap agricultural system
- Have small piece of land provided by Kebele administration

Objectives

In line with ISD objectives, the following general and specific objectives were developed for the project

- **General:**

- To identify potential solutions by engaging the youth in low input urban agricultural activities for income generation

- **Specific:**

- To develop an intensive, market-oriented, mushroom production system for income generation by youth groups

Mushroom Production

- The idea did not come at once (I had a plan of growing mushroom some 8 years back while living abroad)
- The idea was repeatedly shared with the youth
- Expert consultation (Dr. Dawit) was made on feasibility of growing mushroom under the urban youth circumstances.
- During the discussion the following points were considered
 - Possibility of integration with existing activities
 - Seed (spawn) source
 - Sustainability
 - Market opportunity
 - Knowledge availability on how, where, cost and when
 - Initial requirement to start the business
- Later, the concept idea was discussed with concerned bodies of the institute and developed into a project proposal for funding.
- The project was finally funded

Implementation

■ **Beneficiary Identification**

- Selection was made based on past interventions
- Nib Environmental Protection Association and Youth Development Association of Compost and Flower, who work in Yeka sub-city Kebele 03 / 04 were chosen
- The beneficiaries were young women
- Planned to empower three young women from each youth group

■ **Briefing on the Activity to the Youth Associations**

- the necessity of knowledge and skill acquirement, seed source, market linkage, profitability and in general, benefits were discussed

Beneficiaries



Key Concern

- They were familiar to the wild mushrooms (they live way above the French embassy, close to the hills)
- They questioned the edibility of mushrooms
- They were skeptical about the opportunities too and there was resistance
- Two-way dialogue continued until they internalized it and were convinced

Capacity Development - Training

- Knowledge source - Dr. Dawit Abate, AAU, Biology department.
- Training was designed for 12days (Dec 2007 and Feb 2008)
- Ten youth members and two staff from ISD participated in the training.
- A simple guide manual on oyster mushroom cultivation was prepared for the purpose by Dr. Dawit
- The training components were:
 - Simple lectures on basics of mushroom cultivation
 - Mushroom cultures
 - Mushroom spawn making
 - Preparation of substrates
 - Inoculation of substrates with mushroom grain spawn
 - Managing the mushroom house, watering the substrates and harvesting.

Capacity Development - Training

- Beginning from the culture to substrate inoculation every trainee had practically worked on each mushroom growing stage.
- Interestingly the flow of the training schedule was arranged in the way to see the results of the previous practical work.
- Therefore each of us experienced mycelia growth in a Petri dish, spawn running stage, incubation and fruiting.
- During the training we had a chance to see a small mushroom enterprise, and became familiar to three different types of mushroom (Shiitake, Agaricus and Oyster) also their different substrates.
- We came to understand how mushroom cultivation needs proper hygienic condition, care and handling.
- The type of the raw materials used for spawn and substrate making for Oyster mushroom are easily available on the market.

Training



Substrate preparation



Micro grants to Start up Small-scale Enterprises

- Two appropriate mushroom growing rooms were constructed in both youth association sites in January 2008, before the training is completed.
 - One was a corrugated iron sheet house 4 x 5 m and the other one was a greenhouse 9 x 6 m.
 - A three layers of wooden shelves was built in each room.
 - The raw materials - cotton seed hulls (oil mills waste cotton seed cake), wheat bran and gypsum along with some other utensils were provided
- Spawn making is the most important and needs expensive equipment and a washable concrete house. An Institution, private enterprises, etc, should manage it.
- Up to now the mycology lab of AAU, Biology Department was supporting spawn to the youths.
- Luckily a private spawn enterprise is recently coming. Therefore the youths will simply buy spawn.

Mushroom Cultivation Rooms



Actual Performance

- Both Youth development associations of compost and flower and Nib environmental protection have started their first substrate preparation and inoculation on 5th and 10th of February 2008, respectively
- Oyster mushroom (*Pleurotus ostereatus*) was selected because it is easy for beginners
- Since then they have been preparing substrates once or twice a week depending on the availability of spawn
- They use plastic bags to store the prepared substrates. The groups harvested their first product of oyster mushroom in the 1st week of March
- The growing houses have not yet reached full growing capacity

Amount of mushroom produced and income generated

| Youth group | No. of bags | Newly opened bags | Harvest (kg) | Sold (kg) | Income (Birr) |
|---------------------|--------------------|--------------------------|---------------------|------------------|----------------------|
| Youth Devp't Assoc. | 64 | 54 | 30 | 12 | 550 |
| Nib Assoc. | 77 | 30 | NA | 9 | 684 |

Actual Performance

- The weight of the total harvest of mushroom was not well recorded due to the fact that this is the first produce, the amount was very small and was not marketed.
- The produce was therefore sun dried and was not weighted. And off course some of it was consumed by the youth and a small amount was wasted.
- Contamination was very minimal. Only 2 to 3 bags were found contaminated in one of the youth groups.
- Rodents ate some of the substrate and are becoming a challenge to the youth development associations.
- In addition to the plastic bags, few clay pots were used. The incubation period was found long and production of fruits took longer time. However, the fruits were very large.
- It is is observed second pick is on average 15 days after the first pick.

Actual production of mushroom



Follow-up visit and discussion



At last...Fruiting



Demonstration of Mushroom Cooking



Various Mushroom Dish Preparations



Marketing

- Nib associations managed to sell even their first produce of mushroom.
- Nib youth association is well known by the neighborhood for its organic vegetables and ornamental plants production. There is a fixed day in a week for selling vegetables and this created a good opportunity for marketing their mushroom.
- The second group is recently linked to a market and is delivering fresh mushroom once every four days.
- After a month and half it is expected that they will reach full capacity. Nib youth association should look for a dependable outlet for bulk marketing of their products.

Income projection – Youth Devp't Assoc.

- Size of mushroom cultivation room – 20 m square
- Yield estimation – 80 kg / month
- Price of mushroom / kg. – 40 Birr
- Total expected income = 3200 Birr
- Cost of production (estimated) = 1000 Birr /month
- Net Profit = 2200 Birr/ month
- If 20 % of the income (440 Birr/mo) is for the association and the remaining 1760 Birr is for the three beneficiaries, then each of them will get 586 Birr/mo

Income projection - Nib Assoc.

- Size of mush room cultivation room – 54 m square
- Yield estimation – 120 kg /month
- Price of mush room / kg – 40 Birr
- Total expected income = 4800 Birr
- Cost of production estimated = 1500 Birr
- Net Profit = 3300 Birr
- If 20% of net profit is for the Association (660 Birr/mo) and the remaining 2640 Birr for the four beneficiaries, then each of them will get 660 Birr/mo

Benefits and Opportunities

■ **Benefits**

- Since the nutrition value is high they will get a healthy nutritious diet.
- It will enhance household food security
- It will generate cash income and
- Once the mushroom harvest is finished the substrate can be added to a compost pile and be reused as a natural fertilizer

■ **Opportunities**

- The acquired knowledge can be effectively transferred to their back yard to ensure food security and income
- Fresh and healthy food for the family
- Good image in the society
- Excellent opportunities for direct selling and consumers are in the position to see how their food is produced
- The experience can be scaled up in other urban areas

Conclusion

- The youth, with support from ISD, have now been introduced to another type of urban agriculture activity
- They easily diversified their area of working environment.
- Mushroom production can be undertaken with a relatively low capital, technology and inputs which makes it attainable and affordable for small scale enterprises.
- The advantage of mushroom cultivation is already demonstrated with the youth groups and they now want to expand the mushroom cultivation room.
- The youth are excited to experience food like mushroom and they like it.

Acknowledgements

I extend my deep heartfelt appreciation to Dr. Dawit Abate, for his support from inception of the idea up to realization of the project. Wt. Zenebech also shared this success and I take this opportunity to thank her.

Thank You!

