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# Study of Marketing and Processing of Mushroom Production with a View to Increase Income among Local Mushroom Producers in Zambia

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***Abstract***

*This research is about the adoption of mushroom farming as a source of income generation by smallholder farmers in Zambia. Mushroom farming business specialize in growing mushrooms. These mushrooms are used by customers for either medicinal or culinary purposes, depending on the type of mushroom grown. Additionally, they may be sold wholesale to clients or at retail prices. A mushroom farm business' ideal customer is a restaurant that focuses on using locally sourced ingredients. Restaurants and Hotels will have regular orders that provide stable income. Through the literature review and the study, it was found that the mushroom production is profitable because it has a huge market within Zambia and also that it is climate independent and it doesn't require a large land for production. To accomplish the objective of the research the following research questions were formulated: What is the farmers' knowledge on mushroom farming? What is the willingness of farmers to do mushroom farming? To answer these questions three focus groups and three interviews were undertaken. The focus groups consisted of producers, traders and established company doing mushroom production. Based on these results the research concluded that there are knowledge gaps among the Mushroom farmers especially on Marketing and Processing skills. It was also evident that there are very few established companies in Mushroom production and have monopolized the production of mushroom. There is a lot of potential yet for mushroom farming locally since there's such a large amount of organic waste products to contend with.*

***Keywords:*** *Mushroom farming, Market strategy, Income generation.*

## Introduction

A mushroom is the fleshy, spore-bearing fruiting body of a fungus, typically produced above the ground on soil or on its food source, mostly in forests *(Hafiz F, et al, 2003).* It is perhaps the most well-known and documented edible forest product. Although not yet as popular as crop farming or fish farming, mushroom farming does hold its own unique prospects in Zambia. Despite Zambia having a climate that is favorable to the natural growth of mushroom, mushroom production in Zambia is still in its infancy.

Mushrooms are fungi. They belong in a kingdom of their own called fungus, separate from plant and animals. Fungi differ from plant and animals in the way they obtain their nutrients. The word "mushroom" means different things for different people in different countries. They do not have green chlorophyll and so do not manufacture their own foods. It possesses microscopic spores, which serves as a means of reproduction *(Chang & Mshigeni, 1997).*

Mushrooms are of different kinds. The edible mushrooms have medicinal importance while the others are non-edible *(Sergeeva, 2000*). There are two main types of mushrooms: *mycelial* and *mycorrhizzal*. Essentially all the cultivated types are mycelial and can grow wherever there is an appropriate growing medium.

The demand for mushrooms is booming in Zambia these days because of increase of hotels, restaurants and other exotic places in the country. Despite the clear benefits of mushroom production for smallholders, the potential of mushroom production remains unexplored. This may be linked to the common belief among farmers that there is no market for mushrooms. However, there are indications that suggest that there is, in fact, there's significant unmet demand for mushrooms in Zambia especially in the dry season *(Chang & Mshigeni, 1997).*

### Purpose of study

The demand for mushrooms is on the increase, and is bound to even increase more. Stores, hotels, hospitals, restaurants and individuals will continue to demand for it, and for the farmer who is ready to put in the effort, the reward will be reaped in due time. The following are the main objectives of the study:

i) To analyze the profitability of Mushroom production and problems in Mushroom marketing

ii) To examine the role of producers and traders in Mushroom value chain process

iii) To offer suggestions on the measures to improve the marketing efficiency of producers and processors

### Problem statement

There is little knowledge about Mushroom cultivation amongst the small-scale farmers in Zambia hence there are missed opportunities to make income from the small-scale farmers in Zambia, though most farmers have a negative approach towards Mushroom production. Zambia's climate favors natural growth of mushroom but this is on a seasonal basis. Cultivating of Mushroom when it's not in seasonal would result in income generation especially that the demand for Mushroom is on the increase, and is bound to even increase more. Stores, hotels, hospitals, restaurants and individuals will continue to demand for it, and for the farmer who is ready to put in the effort, the reward will be reaped in due time.

## Existing solutions

- Make awareness of the benefits of cultivating Mushrooms.
- Since most farmers don't know how to cultivate Mushroom, workshops on how to be cultivate, market and produce mushroom are essential.

### Best one

There is a huge market for Mushroom in Zambia. The value addition which comes with the scarcity of mushroom during its off season need to be explored in Zambia. The urban population has changed their options on mushroom because some time back, people were skeptical when it comes to consuming mushroom because little was known on mushroom and people were scared to end up consuming poisoners Mushroom. The best solution is to spread awareness on the edible mushroom and how to grow it.

## Limitations

Seasonality of the natural growing of mushroom production leads to low prices at the time of mass production is at the base of mushroom value chain limitations. In addition, transport costs may be incurred in the process of following the urban markets and this can render distortion of prices. Lack of investment programs in establishment of processors has led to limiting the marketing avenues available for mushroom production.

### Achievements

As a country there is still a lot of struggle to harness from mushroom production in Zambia. However, there is one mushroom producer well known in Zambia namely JIHAI Investment Zambia. JIHAI investment Zambia has since been cultivating, marketing and producing mushrooms at a higher scale throughout the year.

Some of the small-scale farmers have started producing cultivated mushroom.

## Methods

This study undertook a survey in the eastern region of Zambia. Qualitative and quantitative data was collected based on informal interview of key respondents, and structured interviews of mushroom producers and traders. In this case, the Producers are defined as those who grow or gather mushroom from the wild and do not engage in trading of the product. Traders are those who engage in bulk buying and take to large markets mostly in urban areas.

### Primary data collection

Primary data was collected using interview and well-structured questionnaires from 60 Mushroom producers and 20 traders. The study only managed to interview only one processor namely JIHAI Investment Zambia who are found in the Lusaka, the capital city of Zambia.

Purposive Random sampling was done and the study settled for a sample size of 60 Mushroom producers that were grouped in five (5) focus group discussions to establish the avenues of sell, and the profitability of mushroom production. In the same vein, individual interviews were conducted to the seven (19) mushroom traders.

Only one processor was available to be interviewed for the study to establish the profitability of the mango processing industry.

The groups were chosen strategically in that the group near the town was expected to have slightly different income generating activities than the ones further away from the town. Their access to market for the market was also assumed to differ and also land access.

**Secondary data collection**

Secondary data was collected from the internet, journals of previous papers on mushroom production value chains, offices of government departments such as Ministry of Agriculture, Ministry of Commerce and Trade. Central Statistics Office and local libraries were some of the places where secondary data was collected.

**Quantitative analysis**

Quantitative analysis was done through collecting data through a survey from the producers, traders and processors in Eastern Region of Zambia. This was done in order to give an indication producing and trading benefits and problems encountered in the Mushroom value chain.

The researcher prepared the trading, profit and loss accounts in order to establish the profitability of both producing and selling mushroom. This is shown in table on page 14 in this paper.

## Results

The results found from the interviews was that that each group of participants had particular results:

- Focus group discussion for the producers, there is so much loss at in terms of profit. Since when there is mass production, the prices of mushroom become low. And sometimes the mushroom goes to waste since there is no meaningful storage to prevent rotting.
- The production practices are not up to standard to get maximum yields and hence get maximum profits
- The producer always relies on the trader to purchase the commodity. They do not pursue the urban markets
- The cost of producing and gathering of mushroom is low.
- There are no organized markets where the producer is able to take their produce for sale.
- If the mushroom isn't cultivated, then the producers only have access to the mushroom once a year from November to February.

i) Individual Trader interview findings

- They struggle with proper storage of Mushroom when there is mass production of mushrooms especially in the rain season when abundant of it is naturally grown.
- They have to incur storage cost to redeem some of the Mushroom they buy/sale
- The transportation cost is very high
- They get mushroom from far remote areas.
- There is no organized market for the traders
- They incur utility bills such as electricity
- They have difficulties in setting prices
- There are so many on the market during the production season

ii) Mushroom Production Company

- The company has monopoly of producing and selling of mushroom at a competitive price
- Incur high utility bills such as electricity and water
- The production costs are very low but the returns are very high.
- It needs technical knowhow to produce mushroom to the required standards
- Competition in mushroom production is very low.
- They sell their mushroom produce to hotels, restaurants and supermarkets.

## Discussion

A mushroom is the fleshy, spore-bearing fruiting body of a fungus, typically produced above the ground on soil or on its food source, mostly in forests *(Hafiz F, et al, 2003).* It is perhaps the most well-known and documented edible forest product. Mushrooms are fungi. They belong in a kingdom of their own called fungus, separate from plant and animals. Fungi differ from plant and animals in the way they obtain their nutrients. The word "mushroom" means different things for different people in different countries. They do not have green chlorophyll and so do not manufacture their own foods. It possesses microscopic spores, which serves as a means of reproduction *(Chang & Mshigeni, 1997).*

Mushroom farming business specialize in growing mushrooms. These mushrooms are used

by customers for either medicinal or culinary purposes, depending on the type of mushroom grown *(Noble, 2005)*. Additionally, they may be sold wholesale to clients or at retail prices. A mushroom farm business' ideal customer is a restaurant that focuses on using locally sourced ingredients. A restaurant will have regular orders that provide stable income. A restaurant that focuses on serving locally sourced foods will be less likely to purchase their mushrooms from a large supplier that's in another state *(Noble, 2005)*. There is a lot of potential yet for mushroom farming locally since there's such a large amount of organic waste products to contend with. What would be considered as waste for the organic farmer is a substrate for the mushroom farmer *(Mshigeni & Chang, 2000)*.

The impacts of the mushroom business on livelihoods and poverty reduction are significant and wide-spread. Mushroom cultivation does not require a lot of land and is a viable and attractive activity for both rural farmers and urban dwellers. Mushroom growing does not require significant capital investment and the scale of cultivation can be large or small based on the capital and labor availability. It can be cultivated on a part-time basis with little maintenance.

The understanding of the benefits by the participants was varied as shown in the following points:

- Source of income for households producing them. Sale of mushroom can earn the household's extra income above their normal farming activities. This was alluded to by all the participants, this shows extensive understanding pertaining to income from mushroom.
- Maximum utilization of space. This was very attractive for the farmers who have small land or landless since mushroom production needs a small space which can even be in the main house. Mushroom farming may have provided a very convenient way of farming from limited space.
- Season independent. Since the mushrooms are grown in a controlled environment they can be grown at any time of the year. This makes them able to spread their labor throughout the year as other farming activities were dependent on the rainfall.
- Consumption of mushroom. This means that even if they are not sold to get income they can be consumed as food and above food they had medicinal value. This means that the more you consumed mushroom the more your immunity grew strong.
- It's a diversification option for households. This means that the household will have more farming activities hence distributing the risks associated with farming especially in drought prone areas.

The Zambian economy is further shrinking with the falling international Copper prices of its main foreign exchange earner on the global market. Climate change is also negatively affecting the Agriculture sector its number two foreign exchange earner. While the copper mineral could be exhausted agriculture development requires rethinking with a holistic approach to give it the expected economic benefits under the current change scenarios. This aspect is currently not well considered and planned for. While there could be so many possible interventions at the national level including for the agriculture sector, studying the agribusiness potential with a view of promoting an informed decision making for diversifying from the mono crop maize to growing mushroom able to fair well under changing climate is the right beginning.

The demand for mushrooms is booming in Zambia these days because of increase of hotels, restaurants and other exotic places in the country. Despite the clear benefits of mushroom production for smallholders, the potential of mushroom production remains unexplored. This may be linked to the common belief among farmers that there is no market for mushrooms. However, there are indications that suggest that there is, in fact, there's significant unmet demand for mushrooms in Zambia especially in the dry season *(Chang & Mshigeni, 1997)*.

Most of the mushrooms supplied to the Zambian market are picked from forests during the rainy season, which is between November and March. One reason why potential investors or farmers should consider mushroom business is that during the dry season, mushroom becomes increasingly scarce and the market is starved of constant supply until the next wet season. This makes the supply of mushrooms very seasonal, not just in Zambia, but in many parts of the world where they serve as food. As a result, mushrooms can fetch much higher prices during the dry season, which is May to October when the supply often does not keep up with the demand. This is

why farmers should consider cultivating mushroom for profit making all year round.

Mushroom production has been described as the most versatile and prolific agriculture and forestry venture all over the world. The Food and Agriculture Organization (FAO) has been actively promoting mushroom cultivation for rural development and food security in developing countries like Zambia *(FAO, 2011).*

Mushroom production creates a zero emission, that is adjusting and maintaining a dynamic balance within the ecosystem by turning waste into something useful in a sustainable manner. Mushroom production provides gainful employment to youth and rural women. It can earn foreign exchange from exports as well as reducing food scarcity in the society. As funding to promote the production and consumption of mushrooms is limited, local governments and NGOs can play vital role to develop mushroom agriculture to arise at industrial level which can create ample employment opportunities both in semi-urban and rural areas.

Mushroom is a high value niche product with great potential to contribute to enterprise diversification and poverty alleviation by utilizing agricultural wastes, thus providing an environmentally friendly disposal system *(Matila et al, 2002).* Mushroom cultivation can help reduce vulnerability to poverty and strengthens livelihoods through the generation of a fast yielding and nutritious source of food and a reliable source of income *(Marshall and Nair, 2009).* Mushroom cultivation activities can play an important role in supporting the local economy by contributing to subsistence food security, nutrition, and medicine; generating additional employment and income through local, regional and national trade; and offering opportunities for processing enterprises *(Matila et al, 2002).*

Mushrooms can be successfully grown without access to land, and can provide a regular income throughout the year. Growing mushrooms also helps avoid some of the challenges facing collectors of wild fungi, including species identification, obtaining access and permits for collecting, and practicing sustainable harvest *(FAO, 2011).* Cultivation is also independent of weather, and can recycle agricultural by-products as composted substrate which, in turn, can be used as organic mulch in growing other horticultural crops, including vegetables *(Marshall and Nair, 2009).*

Successful marketing strategies differ according to region, transport infrastructure, market accessibility and consumer preferences *(Beetz & Kustudia, 2004).* They are different for fresh and dried mushrooms, and are influenced by the species. For example, locally-grown mushrooms have an advantage over imported ones because of their very limited shelf-life and their fragility, making it difficult to ship them easily. Similarly, mushrooms for fresh use tend to be grown near urban consumers, while farmers situated some distance away from their consumer base, market their product after processing *(Mshigeni, & Chang. 2000).* Establishing a good relationship with a buyer by delivering a reliable quality and quantity of product is fundamental. It is important to start modestly and secure a buyer or small network of buyers to whom one can deliver a reliable supply *(Beetz & Kustudia, 2004).*

The marketing strategies will include and not limited to the following tools that will help the firm thrive and be able to sell more of the mushroom. These are called the 7 Ps of marketing namely Product, price, promotion, people, physical evidence, place and processes. For the mushroom business to survive in their marketing strategy and ultimately in the strategic planning and the set-out goals that encompasses profitability, the marketer should make sure that the market mix of the 7Ps is taken care of. For example, promotion of the product would be in many ways such as branding the product and advertise in a way that the customers are able to find the product. The mushroom business must be able to communicate to the customers what they are selling and the benefits that are derived from the product. For the mushroom business we have already seen how beneficial the mushroom is and those benefits must be communicated to the customers and producers of the products. Promotion is also embedded in the digital marketing where for example the media is used to communicate to customers the potential and goodness of the mushroom. The computer age has made it easier to sell on internet and to all places. The place now is wherever someone is able to communicate on internet they are able to access a product. This works to reach out almost all people who is able to access social media.

JIHAI Investment Zambia have branded their mushroom products and according to proprietor. And branding has helped them to sell and

penetrate the market that was already has little or no competition.

## Conclusion

Mushroom cultivation should be considered a preferred activity for development programs targeting income generation among smallholder farmers in Zambia because it is suitable for the smallholder farmer's life style. The product is highly nutritive and a good food for their children and old parents, and because of its high economic value they can also earn some income from the production. Though the small-scale farmers who participated in this research do not fully understand the benefits associated with mushroom farming. There is a need to emphasize in detail the benefits of mushroom farming during workshops, trainings or any other means of awareness so that the farmers can fully understand the benefits of mushroom farming.

Popularity of mushrooms is ever increasing throughout every part of the world because of its exotic flavor and their culinary properties whether eaten alone or in combination with other foods. But until now, it is not well known that mushrooms are full of nutrients and can therefore make a very important contribution to human nutrition. Thus, mushroom cultivation may reduce poverty and improve the life style of many poor farmers in Zambia.

## Figures and tables

**Table 1.** Respondents background information

| | Producers groups | Traders group | JIHAI Investment Zambia |
|---|---|---|---|
| **AVERAGE LAND SIZE** | **0.30- 1.5 Acres** | **0.25- 1.5 Acres** | **2 Hectares** |
| HOUSEHOLD SIZE | 4-7 Members | 2-6 Members | N/A |
| ACTIVITIES | Farming Maize, goat and cattle rearing. | Farming Maize, goat and cattle rearing, gardening. | -mushroom cultivation<br>-branding, Selling<br>-Marketing. |

**Table 2: Claims and Benefits according to respondents.**

| | Producers groups | Traders groups | JIHAI Investment Zambia |
|---|---|---|---|
| Benefits | -Income,<br>-A source of food<br>-maximum utilization of small land<br>-Season independent | -Income.<br>-Medicinal value.<br>-Food.<br>-Constant supply | -Income Diversification opportunity.<br>-Constant production hence spreads labour<br>-maximum utilization of small land (high returns per unit area)<br>-Not climate dependent.<br>- providing employment |
| Claims | -mushroom has short life span<br>-Lack of market.<br>-High initial investment.<br>-High labor requirement-<br>-To get seeds is a problem | -High capital demand.<br>-Lack of market-sold at local market<br>-marketing the product is too involving. | -High capital investment.<br>-High initial labour requirement.<br>-Lower prices than expected<br>-Low yields in periods of water shortage.<br>-Diseases common.<br>-High water usage.<br>-Fluctuation of prices. |

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