

# Marketing of Indigenous Leafy Vegetables and How Small Scale Farmers in the SADC Region can Improve their Incomes



Edited by: Lyatuu E and Lebotse L



## ACKNOWLEDGEMENTS

The activities that led to the publication of this book on “Marketing of Indigenous Leafy Vegetables and how Small Scale Farmers in the SADC Region can improve their Incomes” were financed by the Southern African Development Community (SADC) Secretariat through the Implementation and Coordination of Agricultural Research and Training (ICART) project with support from the European Union. The ICART project is implemented by the SADC Food Agriculture and Natural Resources (FANR) Directorate with funding from the European Union. The contents of this manual are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the SADC Secretariat or the European Union.

We would like to thank the following persons for their contributions to this book.

Silvester Sakala	-	Zambia Agricultural Research Institute
Gilbert Msuta	-	Ministry of Livestock Development and Fisheries, Tanzania
Mercy Marope	-	Department of Agriculture, Botswana
Ketseemang Safi	-	Department of Agriculture, Botswana
Eric Kooma	-	Zambia Agricultural Research Institute

We would also like to thank SADC FANR and ICART Project Staff for their help and assistance in finalising this publication.

### Citation:

**Lyatuu E and Lebotse L. (Eds), 2010.** Marketing of Indigenous Leafy Vegetables and How Smallscale Farmers can improve their Incomes. Agricultural Research Council, Dar es Salaam, Tanzania

# TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	i
TABLE OF CONTENTS .....	ii
ABBREVIATIONS AND ACRONYMS.....	iii
1.0 Background and Introduction .....	1
2.0 Will market of ILVs Increase Smallholders' Incomes? .....	3
3.0 How much does the Marketing of ILVs contribute to your Income? .....	19
4.0 Support for Indigenous Leafy Vegetable Marketing in Tanzania, Zambia and Botswana ..	22
5.0 Increase your Income, Reduce Post-harvest losses of Indigenous Leafy Vegetables.....	30
6.0 Further Contributions from the ILVs Stakeholders Workshop .....	33
7.0 Recommendations and Way Forward.....	35
References .....	36

## ABBREVIATIONS AND ACRONYMS

ACT	Agricultural Council of Tanzania
AIDS	Acquired Immune Deficiency Syndrome
ACT	Agricultural Council of Tanzania
ASDP	Agricultural Sector Development Program
AVRDC	Asian Vegetable Research Centre
DADPs	District Agricultural Development Plans
FFS	Farmer Field Schools
FSU	Farmer Support Unit
g	Gram
HIV	Human Immune Virus
ICART	Implementation and Coordination of Agricultural Research and Training
ILVs	Indigenous Leafy Vegetables
M&E	Monitoring and Evaluation
NPGRC	National Plant Genetic Resource Centre
PPP	Public Private Partnership
SADC	Southern Africa Development Community
SME	Small and Medium Enterprise
SACCOS	Savings and Credit Cooperative Society
SWOT	Strengths, Weaknesses, Opportunities and Threats
TB	Tuberculosis
TZ	Tanzania
VICOBA	Village Community Bank

# CHAPTER ONE

## 1.0 Background and Introduction

Indigenous leafy vegetables (ILVs) have long been regarded as minor crops and thus have attracted little marketing attention, in favour of major crops and cash crops. ILVs tend to have short production cycle, require less or few inputs and produce high yields with high nutritional value. As such they can support small holder farmers both in terms of subsistence and income generation without requiring large capital investments. Despite the potential that production of ILVs has, there has been little dissemination of information with regard to their marketing and the role market players play in developing these vegetables. Farmers need marketing information that will help them to make informed decisions on what to produce with assured quality, where to sell their produce (market identification) and at what price. Availability of marketing information about ILVs would attract more people to engage in their production and marketing as there is potential demand for these vegetables.

### 1.1 What are Indigenous leafy Vegetables?

Indigenous Leafy Vegetables (ILVs) can be defined as “Plants that are native or introduced whose leaves have been used over a long time hence have become part of the culture & tradition of a community” (Maundu, 1997). These vegetables include but are not limited to Amaranthus (*Amaranthus spp*), Cowpea leaves (*Vigna spp*), Nightshade (*Solanum Spp*), Spider plant (*cleome spp*), Sweet potato leaves (*Ipomeas spp*), Pumpkin leaves (*Cucurbita spp*), Jute Mallow (*Corchorus spp*), Cassava leaves (*Manihot esculenta*), African eggplant (*Macrocarpon spp*). The term “indigenous” has been used in generic form to accommodate those crop species, although not limited to native area, but have been produced over years for the enhancement of high value of nutritious leafy vegetable. There is now recognition that ILVs are important for food security and that their production, marketing, and processing are significant contributors to income. Marketing of ILVs is increasingly becoming an important source of income for most small scale farmers in the SADC Region (especially women) who can not get employment in the formal sector.

The Permanent Secretary for the Ministry of Agriculture, Food Security and Cooperative in Tanzania while addressing people said that, “In mentioning names of Indigenous Leafy Vegetables my mouth is already watering and I believe this is not happening to me alone in this room. It must be true to many of you who have enjoyed and love food spiced with the aroma of these vegetables”.

### 1.2 Status of ILVs in Tanzania, Zambia and Botswana

Production of ILVs is one of the fields that offer employment with higher profit returns, yet the starting capital required is lower than for most other agricultural investments. Nutritionally, indigenous leafy vegetables can provide widely accessible sources of essential vitamins particularly A, C, and minerals (such as calcium and iron) as well as supplementary protein and calories. Market potential of indigenous leafy vegetables is very large and has not been exploited. Current economic situation in the SADC Region particularly for Tanzania, Zambia and Botswana provides opportunities for an expansion of ILVs production and marketing to enhance increased income of small scale farmers. Moreover, there is a huge potential to commercialise ILVs, which currently are used mainly for subsistence in rural areas in either fresh or processed

form. This sector is very important as it employs disadvantaged individuals and groups who cannot get formal employment any where else, except by growing these ILVs.

### 1.3 Indigenous Leafy Vegetables



**Fig1. Cowpea**



**Fig2. Pumpkin**



**Fig3. Spider plant**



**Fig 4. Amaranth**



**Fig 5. Nightshade**



**Fig 6. Sweet Potato**

## CHAPTER TWO

### 2.0 Will market of ILVs Increase Smallholders' Incomes?

The rise of supermarkets is transforming the food retail sector. Supplying ILVs to supermarkets presents both large potential opportunities and big challenges for small scale producers. Tough quality and safety standards pose a challenge to the small scale farmer. To meet these standards, small scale producers have to make investments and adopt new practices so that they are not excluded from dynamic markets. Intensive research has been conducted, production recommendations developed; and farmers have taken keen interest to adopt and utilize them for production of ILVs. Due to high demand for these leafy vegetables, most small scale farmers have invested on their production with success.

**Table 1: Cost Benefit Analysis of producing commonly used indigenous vegetables**

Crop	Area (m <sup>2</sup> )	Production Cost (USD)	Total Yield (Kg)	Sales Unity Cost (USD)	Total Value (USD)	Gross Profit (USD)
Amaranth <i>Amaranthus spp</i>	200	34.53	170	0.40	67.86	33.33
Spider plant <i>Cleome spp</i>	200	37.52	250	0.30	74.85	37.33
Jute Mallow <i>Corchorus spp</i>	200	43.83	200	0.30	59.88	16.05

Source: Ministry of Agriculture, Mazubuka Research Station, Zambia, 2009

### 2.1 Marketing

#### 2.1.1 Marketing Status of ILVs

Recently, there has been an increase in the consumption of ILVs, which has raised demand in the markets. However, the supply of ILVs for the markets has not been exploited due to lack of knowledge on marketing of ILVs. It has been reported that there is a risk of losing ILVs in Tanzania, Zambia and Botswana due to farmers replacing them with improved varieties; lack of seed and information about their performance; input requirements and marketing. Information on how farmers can fit them into the production and marketing systems is therefore of paramount importance and more so in Botswana where cultivation of ILVs has not been largely done, despite high market demand in Botswana. However, efforts have been made in Zambia and Botswana to prolong the shelf life of ILVs through preservation methods such as drying and packaging (Figure 8 and Figure 9). This could be a good lesson for ILV producers in Tanzania, where very little has been done in terms of preservation through drying. It is equally important to mention that, in Tanzania, the common method of preservation has been the use of simple technology known as charcoal cooler. This simple method of preservation (temporary preservation) could be adopted by the other countries (Zambia and Botswana).

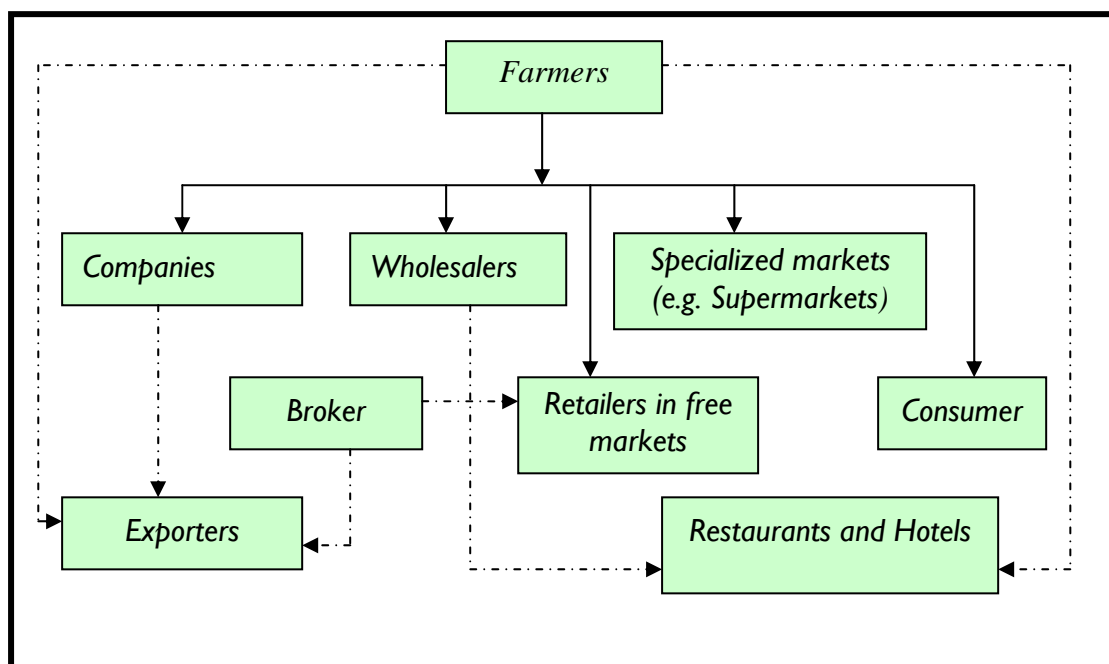


FIG 7. Common Marketing channels in Tanzania, Zambia and Botswana

### 2.1.2 Marketing Channels

The farmer can use either of the following channels of marketing to sell their Indigenous Leafy Vegetables (ILVs) (Figure7).

- Sell directly to consumers-at farm gate or at market place
- Sell to a wholesaler through a broker
- Sell directly to a restaurant/hotel/supermarkets
- Sell to an exporting company
- Sell to the retailer directly

By understanding the above marketing channels, a farmer is able to increase efficiency in business hence raise the total generated income and improve competence thereby increasing the market share.

There are two main types of markets where ILVs could be marketed - formal and informal. Formal markets are specialised types such as supermarkets, wholesale markets, free markets and retail shops (Figures 12 - 15). Informal markets include door to door and road side markets (Fig 10 and Fig 11). The advantages of specialized markets are that there is a specific place where they are situated and where customers will have many choices of ILVs at consistent prices; supply is also consistent and satisfactory, some times with grades and formal packages. Informal markets have many disadvantages to both the seller and buyer. The seller may walk long distances without guaranteed buyers. Damages are also relatively higher in the event that the vegetables are not bought sometimes due to lack of market information.



**Fig 8 : Dried Cowpea Leaves**



**Fig 9 : Dried and packed Cowpea Leaves**

### **2.1.3 Informal and Informal Market for Indigenous Leafy Vegetable**

#### **2.1.3.1 Informal Markets for Indigenous Leafy Vegetable**



**Fig 10: Door to door market**



**Fig 11: Road side market**

#### **2.1.3.2 Formal Markets for Indigenous Leafy Vegetable**



**Fig 12: Free /fresh Market**



**Fig 13: Wholesale Market**



**Fig 14: Specialize Market-Supermarket**



**Fig 15: Retail Shop**

## **2.2 How Small Scale Farmers can make Money from the Sale of ILVs**

Increased awareness through sharing information with stakeholders on marketing could attract more farmers to invest in this sector. One may pose a question as to why indigenous leafy vegetables are thought to be very important. Several reasons exist:

- ILVs are marketable hence they generate income
- They have comparative advantage to small scale farmers as they require few input and low labour
- Empower smallholder farmers, especially women who otherwise could not get employment in the formal sector

Farmers need to meet the standards required in the formal markets, hence their produce should be of high quality. For instance farmers can add value to the ILVs by first chopping the leaves in a form ready for cooking in order to attract more customers (Fig 16).



**Fig 16. Marketing of ILVs by chopping**

Moreover, packaging in plastics and labelling, as well as mixing different ILVs in one bundle can add more value and increase the price. High demand for ILVs in Botswana has been reported; therefore there is need to promote production of ILVs to meet this demand.

ILVs such as Nightshade, Cowpea leaves, Cassava leaves, Pumpkin leaves, Sweet potato leaves and Amaranths have high potential for commercialization. They have also been singled out as the most consumed ILVs in parts of East Africa including Tanzania. A lot of progress has been made in the collection and conservation of germplasm of various ILVs by the National Plant Genetic Resource Centre (NPGRC) and the World Vegetable Centre (AVRDC) based in Arusha. These genetic resources could be accessed by users, such as farmers to promote their growth. In order to promote marketing of ILVs, farmers involved in the production and marketing of these vegetables require education in production and marketing particularly value addition through packaging and labelling. Marketing constraints however exist. One such constraint is the lack of standard measures of the fresh leaves in Botswana, Zambia and Tanzania. Instead, these vegetables are in most cases just sold as bundles. Some standard measurement for use in the SADC needs to be recommended.

## 2.2.1 Transportation of ILVs to the Market



Fig. 17. By Bicycle



Fig 18. By Foot



Fig 19. By Cart



Fig 20. By car/truck/public transport



Fig 21: ILVs stakeholders from Tanzania, Botswana, Zambia at AVRDC, Arusha, Tanzania

## 2.3 Current Situation of Marketing of ILVs by Smallscale Farmers

Farmers or producers get low profits due to high transportation costs and poor negotiation power. Poor or absence of market information system and lack of promotion to articulate need and lobby for interest in the ILVs industry contribute to low returns from sale of ILVs. Lack of consistent supply of ILVs compounded with poor standards lead to failure by smallholder farmers to sign contracts with specialized markets, external markets and restaurants. A possible solution to these problems is the formation of farmer support groups as in the case of Tanzania where farmers operate under groups known as Farmer Support Units. These help to broaden the information base and the pulling of resources together to achieve common goals.

## **2.3.1 Farmer Support Unit**

Farmers support Unit is a way of farmers working in groups interested in the Production and marketing of their produce. Farmer Support Units capture production and marketing information and disseminate to their members using agreed upon methods such as mobile phones, internet, posters or notes board in their offices. Farmers have to register with their groups in a way similar to farmers associations. Once the Unit is established and has an administrative structure it can recruit workers to run the Farmer Support Unit just like a farmers' association.

### **2.3.1.1 Why Farmer Support Unit?**

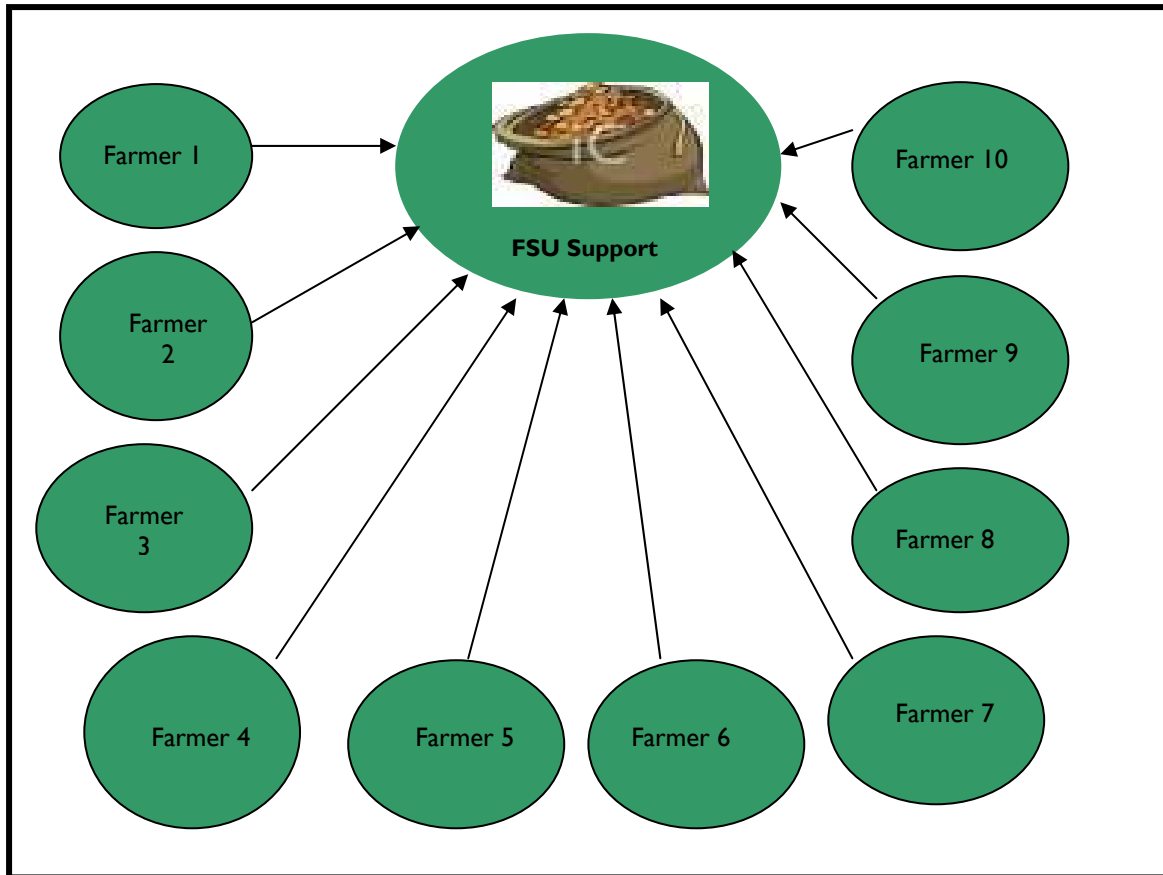
- To have a sense of belonging
- To improve social economic status
- To address or confront common problems
- To pool resources together
- To form a security front
- To complement each other in their diverse talents

### **2.3.1.2 Benefit of FSU**

- The unit collectively sells their products together so that they have a stronger voice in the market.
- Farmers may pull together scarce resources they have
- The unit is properly run and well maintained as a result of the contribution from individual members.

### **2.3.1.3 Comparative advantage of being in Farmer Support Unit**

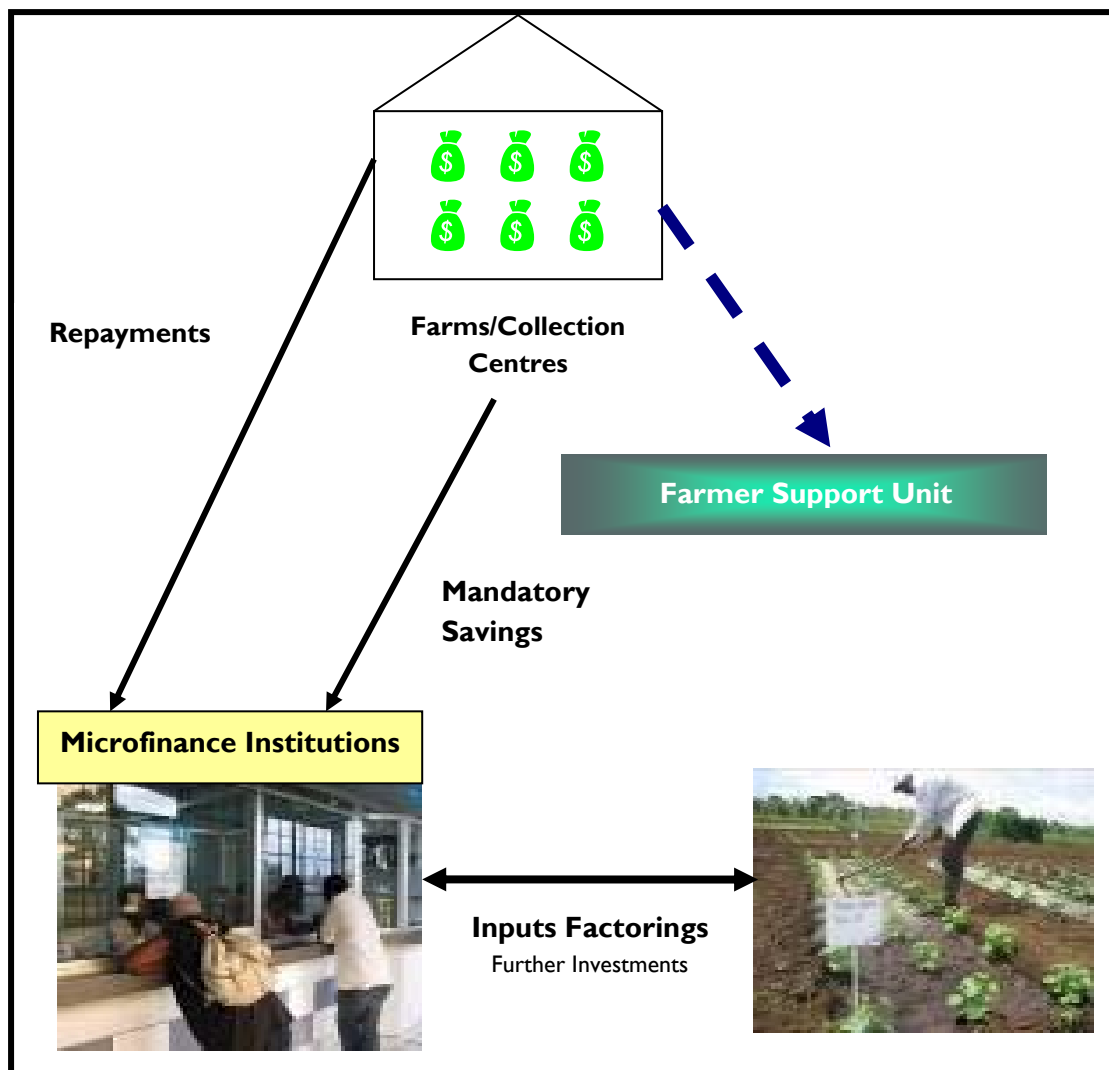
Farmers can use facilities of the group as shown in Figure 22. Members take their harvest to the collection point of the group where by there are temporary preservation facilities such as charcoal coolers to keep their products for up to a few days before they can be taken to the market. The produce is then taken collectively to the market by common transport with the farmers sharing the transportation costs. This helps members to pull their resources together as well as to have sustainable supply of ILVs if they have to practice contract farming.



**Fig 22: Comparative Advantage of a Farmer belonging to Farmer Support Unit**

#### **2.3.1.4 Credit, Loan and Payment to the Microfinance Institution**

Within farmer groups, members can form their own financial savings scheme where they contribute, borrow and repay their loans with interest. A good example is of SACCOS and VIKOBA in Tanzania in which farmers deposit and can borrow cash and repay back after a specified period of time. These schemes can help farmers to invest more in ILVs production and improve their marketing as well as their household financial status. Figure 23 illustrates the system:



**Fig 23: Financial Management and Benefits of Farmer Support Units**

## 2.4 What can be done to ensure consistent supply of ILVs?

Due to lack of formal or standard flow of the marketing channels, marketing depends on the buyer and seller situations. So there is a need to develop standardized and formal marketing system of ILVs in the SADC Region. This is because commercialization of ILVs has been neglected due to traditions and customs of collecting and gathering from the fields and forests. However, human population increases in the SADC Region have resulted in decreased idle, abandoned or virgin land from where most people traditionally gathered ILVs thereby limiting access to ILVs from the wild.

## 2.5 Nutrition

Indigenous leafy vegetables play an important role in the African agricultural and nutritional systems. They are used in meals as side dishes, relish and/or for food variety and decoration. The high protein and vitamin content in these vegetables can eliminate deficiencies amongst children, pregnant women and poor people living in rural areas. Because they are cheaper,

ILVs can replace meat in the diets of those who cannot afford to buy meat. Amaranthus leaves are rich in Calcium, Iron and Vitamins A, B and C. Spider plant leaves have a mildly bitter taste but contain 5% protein, 6% carbohydrates and are high in Vitamin A and C, Calcium, Phosphorus and Iron. Cowpea leaves have high Vitamin and Protein content, and they also fix nitrogen in soil. Nightshade leaves provides good levels of Protein, Iron, Vitamin A, Iodine, Zinc, and Selenium. Sweet potato leaves are rich in Protein. Due to the medicinal value, people suffering from diseases such as high blood pressure, HIV/AIDS, cancer, hypertension have been advised to consume Indigenous Leafy Vegetables.



Consequently, selected high yielding lines suited to local tastes are being promoted to farmers in Africa by many organizations. Supermarket displays and innovative promotions have raised consumer awareness. While investing in Education and advance training on vegetable marketing, knowledge on ILVs must not be neglected. Table 2 shows the nutritive value of ILVs and exotic vegetables popularly grown, consumed and marketed in many parts of Africa.

Table 2 shows the nutritive value of

**Fig 24: Healthy children eat ILVs**



**Fig 25: Some Airlines serve ILVs dishes**



**Fig 26: Supermarkets sell ILVs**

**Table 2: Nutritive value of selected indigenous leafy vegetables and exotic vegetables popularly grown, consumed and marketed in many parts of Africa (Nutrient content per 100g fresh weight)**

Vegetable	Protein (%)	Ca (mg)	Fe (mg)	B-Carotene (mg)	Vitamin C (mg)
<b>Indigenous Leafy Vegetables</b>					
Amaranth	4.0	480	10	10.7	135
Spider plant	5.1	262	19	8.7	144
Cowpea	4.7	152	39	5.7	87
Nightshade	4.6	442	12	8.8	131
Jute Mallow	4.5	360	7.7	6.4	187
<b>Common Exotic Vegetables</b>					
Kales	2.5	187	32	7.3	93
Cabbage	1.4	44	0.8	1.2	33
Spinach	2.3	93	32	5.1	28

Source: FAO ad WHO

### 2.5.1 Recipes for Indigenous Leafy Vegetables

Information on the per capital consumption of ILVs is just as scarce as data on their production levels. It is generally believed that, introduction of exotic vegetable varieties contributed to the decline in the production and consumption of ILVs. However, recent efforts done in reviving and awareness creation on production and consumption of ILVs has increased per capital consumption of these ILVs. Preparation of the ILVs is different from one area to another, depending on the habits. However, the colour of food is often used in food preference.

Dark green indigenous vegetables and dark green, brown-green to light green cooked vegetables are preferred and deemed tasty and healthy in most places. Generally green soups have positive health connotations and are perceived as good weaning preparations. The health value of brown green vegetables seems minimal due to vitamin losses associated with overcooking.

Moreover, the type of smell emitted by the vegetable is an indicator of the manner of how it has been prepared. In general bland foods are acceptable but dishes with strong aromatic and pungent odours (especially of essential oils) are considered repulsive and are shunned. The dearth of aromatic plants, notably the *Anthemideae* tribe of the sunflower family (one of the largest with ILVs in this contest), the mint family (*Lamiaceae*) and *Verbenaceae* reinforces this point. In Tanzania, recipes of ILVs were developed and presented by different researches that did organoleptic tasting and found recommended recipe suitable to most of the consumers as outlined below.

## Pumpkin with Beef



Onions finely chopped –70g,  
Garlic grounded/crushed –8g,  
Sunflower oil-40g,  
Salt-5g.

Preparation time is 10 minutes and cooking time is 30 minutes

### Ingredients:

Beef, sliced –95g,  
Pumpkin leaves-100g,  
Tomatoes finely chopped-250g,  
Carrots cut into cubes-85g,

### Procedure:

Pumpkin leaves are prepared by first removing the main vein and tendrils, before slicing and cooking. Mix garlic with water and beef and boil until the beef is tender. Prepare onions and tomatoes and carrots, prepare pumpkin leaves. Wash and shake to remove water then cut into narrow slices. Preheat the oil, add onions meat and fry until onions are golden brown. Add tomatoes; boil while stirring to make a consistent stew. Add salt, then pumpkin leaves and simmer for 7 minutes, while the pot is covered. Serve on the table.

### Tips to retain and enhance nutrients:

One serving provides 10% of energy, 30% of iron, 30% of Zink and 25% of Vitamin A (Recommended Daily Allowance). Beef improves the bioavailability of iron and provides high quality protein and fatty acids.

## Amaranth with Beef

Cooking time is 30 minutes and preparation time is 10 minutes



### Ingredients:

Beef sliced –120g,  
Amaranth leaves dried –25g,  
Irish potatoes peeled and sliced—300g,  
Groundnuts roasted and blended-40g,  
Carrots sliced –60g,  
Fresh lemon juice 5g and Salt 5g.

### Procedure:

Boil meat until almost cooked. Soak amaranths leaves in about 100ml of water. Prepare carrots, potatoes and groundnuts. Mix meat, potatoes and carrots and boil until potatoes are half cooked. Add leaves and mix well. Simmer for 5 minutes and add lemon and mix well. Check taste before adding salt. Makes 2 servings. This is served with cereals or tubers.

### Tips to retain and enhance nutrients:

One serving provides 15% of energy, 90% of Zink, 40% of Iron, 40% of Protein, 35% of Calcium and 25% of Folic acid (Recommended daily allowance). Beef enhances the flavour

and adds high quality protein and available iron to the food. Carrots provide carotenoids for Vitamin A.

### **Cowpea with Fish**

Cooking time is 15 minutes and preparation time is 15 minutes.

#### Ingredients:

Fresh fish-125g

Onions sliced 100g



Tomato finely chopped 250g

Green pepper cut in cubes 60g

Dried cowpea leaves 25g

Sunflower oil 40g and salt 5g.

#### Procedure:

Prepare fish, onion, tomatoes and green pepper. Soak dry leaves in about 100ml of water. Preheat oil and add onion to fry and stirring until onions turn light brown. Add tomatoes and sweet pepper, simmer while stirring until the tomatoes are soft. Add cowpea leaves and salt, mix well. Simmer for 5 minutes and add fish (do not mix, because the fish might break).

Cover pot and simmer for 5 minutes. Makes 3 servings. This is served with corn meal or rice.

#### Tips to retain and enhance nutrients:

One serving provides 5% of energy, 30% of Zink, 25% of Iron, 25% of Protein, 25% of Vitamin A (Recommended daily allowance). Fish makes the recipe rich in minerals, vitamin A and protein. Green pepper enriches the dish with vitamin C and carotenoids.

### **Spider plant, Pumpkin fruits with Coconut**

Preparation time is 10minutes and cooking time is 10 minutes

#### Ingredients:

Spider plant leaves-150g

Coconut milk –70g

Pumpkin fruits sliced 220g

Onions chopped 70g

Sweet pepper sliced 50g

Sunflower oil 30g and salt - 5g

#### Procedure:

Prepare pumpkin fruit, onions and sweet pepper and leaves. In pot, mix oil, onions, pumpkin fruits and sweet pepper. Add coconut milk and simmer for 5 minutes then Wash leaves add and then mix thoroughly. Add salt and cover pot, simmer for 5 minutes and add salt according to your taste. Makes 2 servings. The tender leaves, young shoots and flowers are eaten boiled as relish, stew or side dish.



Dish



Spider plant



Pumpkin



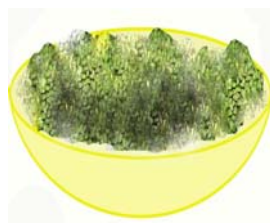
Coconut

To reduce bitterness, leaves can be boiled and water discarded.

Tips to retain and enhance nutrients:

One serving provides 10% of Energy, 25% of Iron, 30% of Calcium and 85% of vitamin A (Recommended daily allowance). Apart from improving taste, coconut milk provides lipids and minerals. NOTE: Avoid discarding water to retain vitamins.

### Nightshade with Green Soybean



Preparation time 10 minutes and cooking time is 20 minutes.

Ingredients:

- Nightshade leaves 150g
- Green soybean shelled 150g
- Carrots cut into cubes 120g
- Onions slices 60g
- Roasted ground nuts paste (blended peanuts) 40g
- Cooking oil 40g and salt.

Procedure:

Boil the green soybeans until half cooked. Prepare onions, carrots and groundnuts. Prepare nightshade leaves, sort and remove stalks and wash. Heat oil, add carrots and onions then add soybean. Fry until onions are lightly browned, add salt to taste, add nightshade leaves and then groundnuts. Mix well and simmer for 5minutes. Makes 3 servings. Often served with corn meal, sweet potatoes, yams, cassava or rice.

Tips to retain and enhance nutrients:

One serving 10% of energy, 25% of Zink, 25% of Iron, 25% of Protein, 45% of Vitamin A (Recommended daily allowance). Vegetable soybeans improve taste by reducing the bitterness in nightshade and also provide protein and vitamin C, A and Folate.

## 2.5.2 Medicinal Value of Indigenous Leafy Vegetables

The promotion of these vegetables has created a very high demand, particularly in this era of going natural. Because of the very many health conditions that have come up such as cancer and diabetes, tuberculosis, HIV and AIDS, people look towards using natural foods. They have turned to using traditional foods as a way of managing, controlling or preventing these illnesses. Thanks to the traditional medicine experts, who also emphasize the use of these foods when giving the remedies for treatment of certain diseases.

Information on the medicinal values of certain vegetables is usually vested in indigenous knowledge. Formal health facilities such as clinics encourage communities to utilise these Indigenous leafy vegetable in their diets. Fig 27 shows some processed indigenous medicines. Even within the SADC region, ILVs are not only consumed for food but are also used for their preventive and curative medicinal properties. Table 3 shows some ILVs that have been found to be utilised by communities to treat/cure/prevent certain diseases. For instance nightshade is recommended to pregnant women so as to increase their blood iron levels.



Figure 27 Medicine extracted from African plants

**Table 3: Perceptions of Measures to Treat Certain Illnesses with Indigenous Leafy Vegetables in Tanzania**

ILVs	Illness	Treatment
Nightshade	Anaemia	Just eat
	High Blood Pressure	Eat fresh or dried fruits without any further ingredients
	Diabetes	Eat fresh or dried fruits without any further ingredients
	Sight problems	Eat fresh or dried fruits without any further ingredients
	Peptic ulcers	Eat boiled fruits with little salt
Spider plant	Ear problems	Rub leaves and put liquid into ears or use flower and leaves
	Headaches	Rub leaves between fingers and smell
	Easy conception	Just eat the prepared vegetables
	Colds	Just eat the prepared vegetables
	Continuous lactation	Just eat the prepared vegetables to stop permanent milk flow
	Stomach pain	Squeeze leaves and drink liquid (especially for children)
Amaranthus	High fever ( <i>degedege</i> )	Squeeze leaves and drink liquid (especially for children)
	Anaemia	Boil leaves and drink boiled water
Cassava leaves	Anaemia	Just eat
	Diarrhoea	Pound fresh leaves, add little soda and water, stir, leaves particle to settle and drink the water
	Nose bleeding	Rub leaves and smell
	Snakebite	Chew leaves and swallow liquid only as a first aid, especially when in the field
Cowpea leaves	Anaemia	Boil leaves and drink boiled water to increase the haemoglobin level
	Skin irritations/ abscesses/ swellings	Cover skin for 1-2days with a paste from crushed and pounded cowpea grains soaked in water
Sweet potato leaves	Anemia	Boil leaves and drink the soup
	Burns	Rub soft leaves between hands and put on the skin/wound
	Wounds due to worms	Put broad leaves over fiver and put on the affected skin
	Asthma	Rub the leaves between hands and add water until water become slimy, sieve and drink the water, or squeeze leaves and mix the liquid with water and drink.
Okra	Stomach upset	Eat bowl of meal with boiled okra fruits, pumpkin leaves, onions and tomatoes (women only)

## 2.6 The Power of Information Sharing on Marketing of ILVs and Financial Management in SADC Region

The power of information sharing and farmer Support Units on the marketing of ILVs can make an enormous difference to general investment and poverty alleviation for small scale farmers in the SADC region. As earlier stated, the potential for the supply of ILVs in the market has not been fully exploited due to lack of Marketing Information. It has been reported that ILVs are running the risk of being extinct in Tanzania, Botswana and Zambia and elsewhere in Africa. One reason for this is that ILVs are continually being replaced with improved varieties due to lack of seed and information about their performance, input requirements and marketing. This is more so in Botswana where cultivation of ILVs has not been practiced, despite the high demand of ILVs in Botswana markets. Poor marketing information system, lack of promotion to articulate need and lobby for interest in the ILVs industry, lack of consistent supply of ILVs and poor standards has made farmers fail to sign contracts with specialized market, external markets or restaurants.

### 2.6.1 Current Situation in SADC Region

Potential for markets for ILVs varies across SADC countries. Even for the three countries considered in this book, variations can be broad. It is therefore imperative that market surveys are undertaken to gather information on consumers' needs and preferences with regard to ILVs. Marketing challenges for ILVs can be huge especially for rural farmers who form the majority of producers. Such challenges include the

high seasonality of the production of ILVs; their supply is high during the rainy season and availability leans out with the drying season. Shortage of water for irrigation and the high cost of irrigation equipment add to the list. Lack of improved seed is another problem. Third is the absence of seed standards for ILVs. Although national gene banks in the three countries have collected and conserved seeds of ILVs there are no standard guidelines for management of these genetic resources in storage. For instance, there are no threshold viability levels below which the seed samples could be regenerated. In the area of seed legislation, the Seed Act in Zambia, for instance, does not cover ILVs in all aspects including standards. This has tended to disadvantage ILVs seed growers from formally marketing the seeds. Farmer Support Units available in Zambia generally cover a lot of different crops but not specifically for ILVs. In Tanzania, FSU operate as AVRDC providing farmers with improved seeds.

The World Vegetable Centre-AVRDC is doing a commendable job in availing seeds to the farmers. However, the institution needs to improve on packaging of the seed. Marketing efforts of the ILVs could be futile, unless consumers appreciate the nutritive value of these vegetables. A workshop held in Arusha in the year 2009 and attended by different stakeholders from Botswana, Tanzania and Zambia recommended that consumption of ILVs in these countries be stimulated if market for these vegetables has to be realized. For instance in Botswana alone, production and consumption of ILVs were more regional and ethnic specific. In this regard it there is need to stimulate demand for ILVs in this country. In rural Zambia, demand and consumption of ILVs is highly region-specific. However, in cities the situation is different because of high ethnic diversity. This means that as far as marketing of ILVs in Zambia is concerned, cities and towns are becoming important markets. In some parts of Tanzania, production and supply of ILVs is done throughout the year especially where farmers have been supplied with improved seed. In this case, there is need to create demand for ILVs before they are marketed. In Botswana and Zambia where supply of ILVs is inconsistent over the year, provision of improved seed could help address the production gaps.

## CHAPTER THREE

### 3.0 How much does the Marketing of ILVs contribute to your Income?

#### 3.1 Who are the market players?

Market players/actors are all the people/entities engaged directly and indirectly in doing transaction of ILVs from the farm to the final consumer. You may be in this business without knowing the role you are playing or contributing, but at least you are the part of the ILVs marketing chain.

##### 3.1.1 Where do you fit in?

Are you Wholesaler, Broker, Distributor/Supplier, Transporter or Retailer?

#### 3.2 Challenges facing market players in marketing ILVs

Smallholder supply chains are confronted with limited economies of scale no matter what sort of value chain they are engaged in. Constraints range from small production quantities and heterogeneous quality of produce to limited access to input supplies, capital, market information and the necessary farm management skills. To overcome at least some of these constraints collective action through collective organization of some kind is an essential first step; forming FSU will be highly important. However, available literature does not provide details on successful modes of operation of such collective organizations within high-value agricultural supply-chains in the SADC region. Information sharing will give market players opportunity to know what to bring to the market and hence provide chance for ILV's Commercialization.

#### 3.3 Advantage and Disadvantage of formal and informal marketing

There are two main types of ILVs markets: formal and informal. Formal markets include Specialized markets (e.g. Supermarket), wholesale markets, free markets, and retail shops. Informal markets include door to door and road side markets. Advantages of specialized markets are that; there are special places where they are located, they have a variety of ILVs, prices are consistent and frequency of supply is satisfactory, sometimes there are grades and formal packages. Informal markets have many disadvantages to seller and the buyer, as seller needs to walk long distances without guaranteed buyers. Damages are relatively higher in the event that the vegetables are not bought sometimes due to lack of marketing information.



the

**Fig 28. Door to door marketing**

**Fig 29: Stakeholder Contribution to the ILVs Market Share**

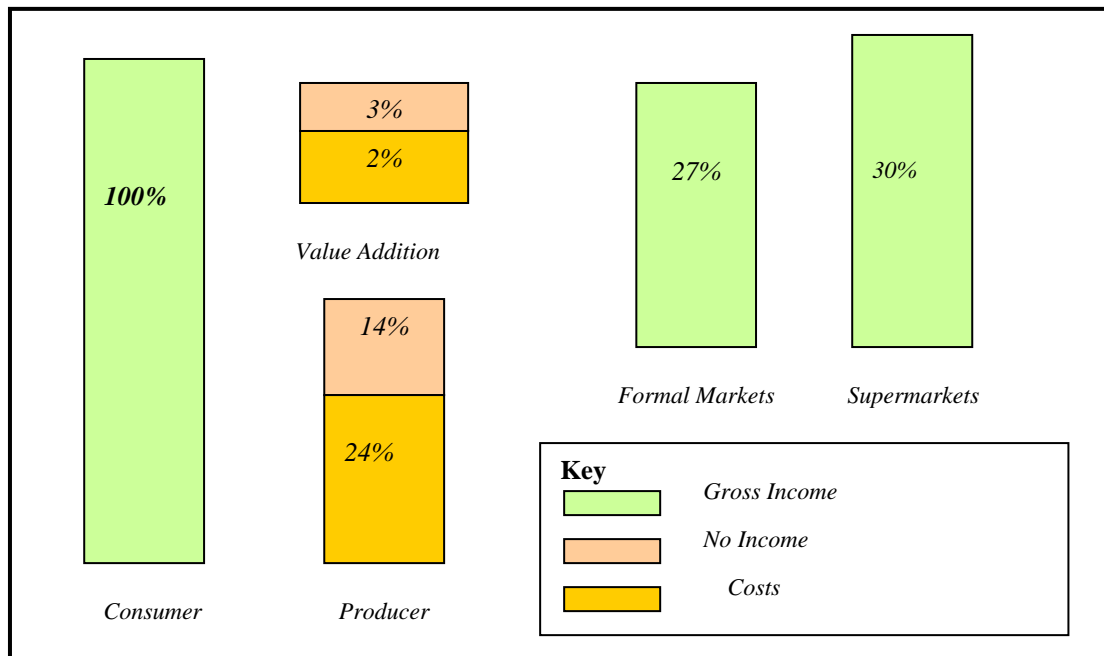


Figure 29 shows the contribution of market players to the market share. The consumer pays 100% for the ILVs gives but farmers (producers) get 14% as net income even when his/her costs amount to 24%. When the farmer adds value to the produce before selling he/she get an additional 3% net profit making the total net profit for the farmer to be 17%. But he/she will also add cost on it (transport or processing) which is 2%. Formal market (retailers, wholesalers,) will get gross income of 27% out of the 100% that the consumer paid. Supermarkets will get 30% as they will be receiving the products on their site, i.e. no transportation costs for them. For this reason market players get relatively good returns when they decide to market these indigenous leafy vegetables.

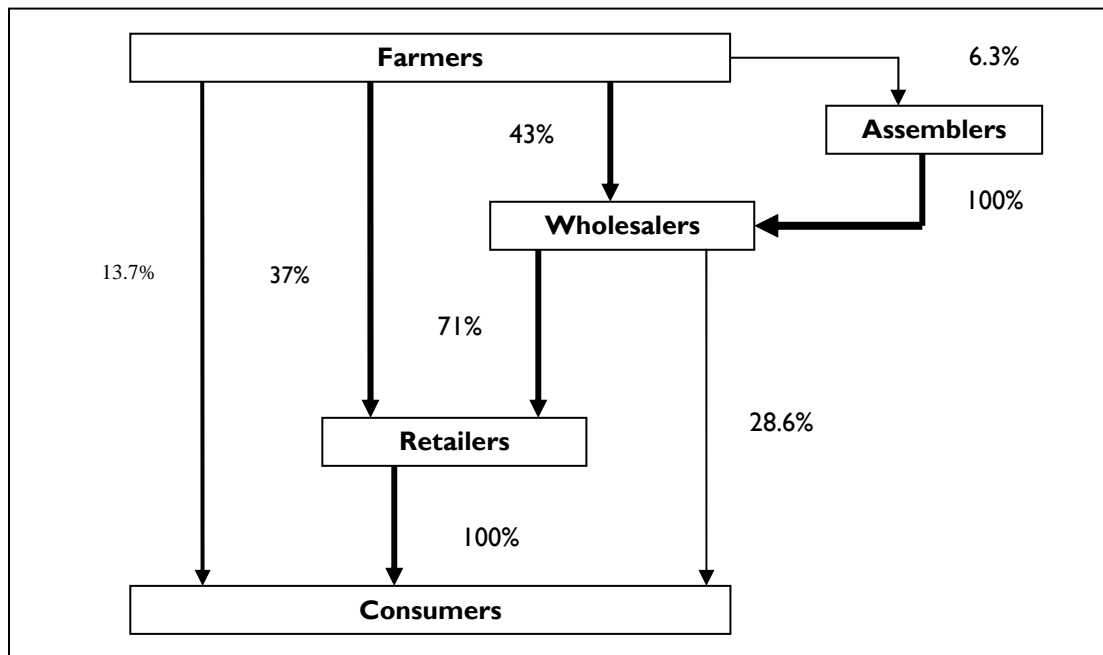
### 3.4 Market Players: Situation in SADC Region

It was observed by ILVs stakeholders that the structured markets such as the supermarkets tend to dominate and disadvantage the small scale farmers, who in most cases sell their vegetables at dictated low prices. In this regard the assertion that the formal markets provide income for the majority of the people may not necessarily be true. In most cases, the formal grading of the ILVs particularly the fresh vegetables for the domestic market is lacking. The informal markets tend to have their own advantages of “buy local and consume local”. The involvement of farmers in the vending of leafy vegetables tends to lead to inefficiency as a lot of time is spent on trying to sell the produce rather than the farmer concerning him/herself with production. Farmers’ associations empower farmers (i.e. FSU) through a number of ways. These groupings enable stronger bargains and organized supplies for the represented farmers.

### 3.5 Who contributes what to the supply of ILVs to the market?

Market players play an important role in adding market value of ILVs. The Figure 30 explains the contribution that each actor makes through channelling of ILVs from the farmer to the consumers. A large proportion of marketing of ILVs is done by retailers. They play a big role in the market and contribute a lot more than the other players. Out of a unit of 100, ILVs reach the consumer in different quantities through several players.

**Fig 30: Contribution of Market players to the supply of ILVs to the consumers**



Source: Lyatuu E, 2007 Marketing of ILVs Research in Tanzania

## **CHAPTER FOUR**

### **4.0 Support for Indigenous Leafy Vegetable Marketing in Tanzania, Zambia and Botswana**

#### **4.1 Introduction**

The Public Private Partnerships are increasingly becoming the driving force behind rural economies in most SADC countries, particularly in Africa. Central governments that used to play a key role in productive activities are gradually decentralizing to allow private enterprises to take part. However, the general move towards market economies does not necessarily reflect the interests of poor rural people. If not supported and given a voice, poor rural communities struggle to utilize the opportunities available in this new environment. There is a need therefore, to adapt approaches which will ensure support for poor rural people to be well equipped to participate equitably with other market forces.

#### **4.2 Small Holder Farmers and Government Support**

In some SADC countries in this case Tanzania, Zambia and Botswana, majority of farmers are smallholders who cultivate small pieces of land confining them to perpetual poverty traps. Countries in the region have not managed to refocus research organizations to better serve the majority of the smallholder farmers. Most technologies produced the research institutions are suited to high cash input users to the detriment of the resource poor small holders. These have been compounded by financial difficulties facing these farmers. Where financial institutions have failed to find innovative ways of financing the resource poor Indigenous farmers few grassroots organizations have been created to fill this gap. Poor access to input and output markets is another constraint. This has been mainly due to governments' failure to invest in roads and communication infrastructure in the rural areas. As a result, farmers incur excessive costs to get inputs to the farms and receive uneconomic returns from selling their produce. Poor organization among the many smallholders has meant that farmers have not been very effective in lobbying their governments for more responsive service institutions in the rural areas.

#### **4.3 Indigenous Leafy Vegetables Policy in Tanzania, Zambia and Botswana**

Research indicates that Indigenous Leafy vegetable marketing in the SADC region is dominated by women, and hence the likelihood that it is the biggest single employer of women in region today. Despite all the above advantages, ILVs still remain a neglected group of vegetable crops. Opportunities for investing in ILVs are greater than disadvantages. With regards to marketing to ILVs, it is important to identify the main challenges/ constraints, related policy issues; share perspectives and experiences on policy; identify institutional arrangements for networking; lobby and advocate for policy changes to institutionalise indigenous leafy vegetable marketing in the region and recommend policy strategies that can be implemented for strengthening smallholder farmers in the region.

#### **4.4 Challenges in ILVs Marketing and Marketing Policy**

Markets, policy, and institutional arrangements are critical in realizing economic growth. But ILVs marketing is characterized by inadequate government intervention. The following issues have been identified:

- Inadequate of reliable market information to both farmers and market advisory service providers. Insufficient mechanisms to set prices; currently ILVs are sold by farmers on the basis of “cost of living” without considering the cost of production and the supply and demand conditions.
- High perishability of ILVs poses major challenges in distribution and marketing. ILVs are mainly abundant during the rainy season.
- Poor roads, which are in accessible during the rainy seasons hinders timely transportation of ILVS to the market.
- Low levels of ILVs productivity partly due to inadequate investment in business and insufficient seed production and supply.
- Inadequate market linkages and market extension support to foster multiplicity of technology transfer systems.
- Inadequate networks as most of the resource poor farmers are not adequately covered
- Poor technical capacity within the government agricultural extension system; lack of capacity building for farmers; weak Research-Extension-Farmer- Market Linkages; and inadequate operating resources.
- Unguaranteed financial sustainability as well as high interests charged by financial institutions when farmers take loans/credits.
- Product losses due to poor handling (sorting, grading and packaging) at the farm level

The marketing system is the critical link between farm production sector and non-farming sector, industry, and economic development. Besides the physical and facilitating functions of transferring the goods from producers to consumers, the marketing system also performs the function of identifying the prices at different stages of marketing and transmitting the price signals in the marketing chain. The issues and concerns in marketing relate mainly to the performance (efficiency) of the marketing system, which depends on the structure and conduct of the market. An efficient marketing system helps in the optimization of resource use, output management, increase in farm incomes, broadening of markets, growth of agro-based industry, contribution to national income and; employment creation. There is concern that, due to illiteracy, ignorance, financial weakness and lack of organization, the farmers are in a poor bargaining position in relation to the consumers/retailers who are well informed, organized, and financially sound.

#### **4.5 Building Effective and Sustainable ILVs Marketing Systems**

To help build effective and sustainable ILVs marketing systems, governments need to focus on educating and training farmers and market players through public and private sectors to increase their understanding of the technical aspects of ILVs production and marketing, as well as of policies and regulations related to ILVs marketing systems. Public Private Partnership (PPP) should be practical and implemented to strengthen output markets;

research should be empowered to generate technologies for farmers for increased productivity. This way situations of oversupply that depress prices and cause farmers to reject the technologies can be avoided. Partnerships between public research institutions, private firms, and civil society organizations offer a means of tapping the strengths of diverse actors and channelling knowledge and resources into areas where they can address complex development problems that are relevant to the needs of resource-poor farmers and food-insecure consumers. Such steps will include more coordinated and predictable government behaviour and increased investment in infrastructure and regulatory frameworks to support the development of ILVs markets. Reducing barriers to ILVs trade would expand markets and make them less vulnerable to local supply disturbances.

In trying to reduce price risks, PPP need to focus on forming contract farming arrangements, which will provide complementary measures aimed at expanding ILVs supply on a large scale. This will require the following: a) Organization of farmers/producers groups; (b) legislation and effective implementation of a contract law; (c) improvement in the quality of input delivery and research and extension economic services; (d) training of farmers in maintenance of quality standards; (e) provision of complementary infrastructure, and (f) development of an effective land record and administration system. Further more, the PPP need to provide extension, training, “best practices” workshops, and other forms of support to entrepreneurs seeking to produce or sell ILVs in the region. ILVs could take advantage of organic farming which offers smallholder farmers, higher and more stable yields and incomes, enhancing food security. This should inspire the PPP to come with interventions that aim at promoting development of local and regional markets for organic products especially the supermarkets that are willing to pay premium prices to certified product quality, hence boosting the potential for ILVs to offer increased earnings to the smallholder farmers.

#### **4.6 The Supermarket Revolution in SADC Countries**

“Supermarket revolution” has been underway in SADC countries since the early 1990s. Supermarkets - here referring to all modern retail, which includes chain stores of various formats such as supermarkets - have now gone well beyond the initial upper- and middle-class clientele in many countries to reach the mass market. Within the food system, the effects of this trend touch not only traditional retailers, but also the wholesale, processing, and farm sectors.

The supermarket revolution is a “two-edged sword.” On the one hand, it can lower food prices for consumers and create opportunities for farmers and processors to gain access to quality-differentiated food markets and raise incomes. On the other hand, it can create challenges for small retailers, farmers, and processors who are not equipped to meet the new competition and requirements from supermarkets. SADC country governments can put in place a number of policies to help both traditional retailers and small farmers pursue “competitiveness with inclusiveness” in the era of the supermarket revolution. As the supermarket revolution proceeds in SADC countries, governments have several options for helping small farmers participate in supermarket channels (or gain access to viable alternatives) and traditional retailers coexist or compete with the modern retail sector.

## **4.7 Policies for “Competitiveness with Inclusiveness” in the Supermarket Revolution**

### ***Option 1: Regulate Modern Retail***

To some extent SADC countries have regulated modern retail. Their goal has been to reduce the speed and scope of its spread. Regulations have mainly limited the location and hours of modern retail. Few SADC countries have a pro-traditional or pro-small retail policy. Instead they usually take a laissez-faire approach to small shops and street vendors and make minimum initial public investments in open and covered municipal markets. A number of SADC countries even have policies that encourage the development of supermarkets and regulate traditional market in order to modernize commerce, lower food prices and congestion, and increase public hygiene and economic competitiveness. Finally, in the early stages of supermarket spread, the supermarket sector is relatively fragmented (weakly concentrated), and farmers and processors thus have a wide range of potential buyers among supermarket chains and between the modern and traditional sectors. In the advanced stage of supermarket spread, however, the sector becomes concentrated. At that stage it is important for governments and the private sector to enforce competition policies.

### ***Option 2: Upgrade Traditional Retail.***

A number of good examples of programs to upgrade traditional retail exist. In most of SADC countries, the programs in question are municipal, sometimes under a national umbrella policy. The programs have several elements in common: Firstly, Governments involved in these programs have a “broad tent” approach—that is, they allow development of supermarkets as well as traditional retailers. Secondly, they promote traditional retailer modernization and competitiveness. Thirdly, they accept the social and market role of traditional markets, street vendors, and small traditional shops but encourage them to locate in non-congested areas and on fixed sites (to increase hygiene and tax payment) and to improve their physical infrastructure. They also train the operators in business skills, food safety, and hygiene.

### ***Option 3: Upgrade Wholesale Markets to Serve Retailers and Farmers Better.***

Traditional market operators typically source food products from wholesale markets, which typically buy from small farmers. Upgrading wholesale markets’ infrastructure and services is thus important to the whole traditional supply chain. Private sector actors are helping traditional retailers (and supermarket independents and chains) obtain the services and products they need. But governments and wholesalers also need to invest in upgrading wholesale markets in order to maximize access by farmers and retailers.

### ***Option 4: Help Farmers Become Competitive Suppliers to Supermarkets.***

Private sector programs are emerging to help small farmers get the assets and services they need to supply supermarket channels. Governments need to supplement private efforts with public investments in improving farmers’ access to assets, services, training, and information. Some of these assets are public goods, such as regulations on retailer-supplier relations to promote fair commercial practices, wholesale market upgrading, market information, and physical infrastructure such as cold chains and roads. Other assets are semi-public or private

goods, such as assistance with market linkages between small farmer cooperatives and supermarket chains; training in post-harvest handling; and credit facilities for making on farm investments in assets needed to meet quality and volume requirements, such as irrigation. In short, the development of a strong ILVs marketing system in SADC partner countries namely Tanzania, Zambia and Botswana requires a coordinated effort between the public and private sectors, where the roles may differ across activities (ILVs production, and marketing), across vegetable types, and across countries. The public sector needs to invest more in providing a sustained market channels. ILVs production and marketing is often more efficiently coordinated by Public Private Partnerships, but they must be supported with an enabling policy environment. Such an environment would include a clear legal framework for local and export market, easier access to micro credit facilities, access to marketing information which will in turn enable the smallholder farmers to make informed decision on what to sell, where to sell and at what prices. ILVs marketing policy should also help promote efficient informal marketing systems, while controlling misleading sales practices. Effective and sustainable ILVs marketing systems and information can help to improve the livelihoods of the region's small holder farmers through increased production as well as sales and consequently benefit consumers, serving as an important element in strategies for income generation and poverty reduction. Consequently, the fact that the supermarket revolution has progressed far and will continue apace for years to come in SADC countries, this revolution will present opportunities for small farmers who have access to infrastructure and possess assets, but it will present a challenge for asset poor farmers and traditional retailers. It is important for governments to build policies and make investments that prepare farmers and retailers to face the challenges and meet the requirements of the modernized food markets whose development is stimulated by the supermarket revolution. It is therefore anticipated that an Indigenous leafy vegetable price policy will considerably influence the marketing system of ILVs. The policy will primarily intend to stabilize ILVs prices and influence the price spread from the farm gate to the retail level.

#### **4.8 Ideal Situation: How ILVs are supported**

The objective of the policy note is to understand the key roles played by Governments, Private sectors and the key stakeholders on marketing of ILVs. It aimed at making sure that the poor rural people who are to be supported are equipped to participate equitably with market forces. It was clearly stated that countries in the region have not managed to refocus research institutions to better serve the majority of the smallholder farmers. Most technologies produced by the research institutions are suited to high cash input users to the detriment of the resource poor small holders' farmers who have been compounded by financial constraints facing the smallholder farmers.

Policy issues are critical to the development of ILVs. Appropriate policies such as water resources have an implication in the promotion of ILVs. On financial institutional support in case of Botswana, financial institutions stand ready to advance the farmer with credit so long as the proposal is viable and clear to both the farmer and the financier. There however are policy variations across the three countries and there is need to prioritize proposed policy issues. For most SADC countries, agriculture is categorized as a key sector to national economy.

#### **4.8.1 Macro Policy Issues: Country development strategies**

Governments should provide provision that will allow or guide sectoral level policies to take cognizance of the importance of minor crops including ILVs in the sectoral policies, in particular agricultural, health, education, environmental and rural development. Governments should allow recognition of minor crops at macro policy level and allocation of resources at sectoral level.

#### **4.8.2 Strategies and Programs**

Formalization of markets should be made friendly and customized to the needs of small scale producers especially those producing ILVs.

#### **4.8.3 Crop diversification**

To take care of ILVs and other minor crops. Amaranthus, cowpea leaves, cleome, pumpkin leaves, cassava leaves, sweet potato leaves, jute mallow, ladies finger, will make the SME income sustainable as home gardening will be given priority.

#### **4.8.4 Medicinal & Nutritional properties**

There is need to sensitize health workers on the value of ILVs. However, Nightshade and Amaranthus are well known to increase blood level, especially for pregnant women.

#### **4.8.5 Financial Institutions**

The following are examples of financial institutions available for funding of production of ILVs in the partner SADC countries, although some of them are not specifically aimed at ILVs:

##### **4.8.5.1 Tanzania**

Agricultural Sector Development Program (ASDP), which is a sector wide program in which the government and development partners provide financing to producers through ASDP basket fund operationalised via the district development plans for agriculture namely; district agriculture development plans (DADPs). SME financing initiatives including cluster competitiveness facilities. The government is in the process of establishing an agricultural bank. This is expected to provide production of horticultural crops, ILVs inclusive. Microfinance institutions including community owned savings and credit cooperative societies (SACCOS) and Village Community Banks (VICOBA) mode of operation of VICOBA is similar to that of SACCOS.

##### **4.8.5.2 Zambia**

Economic Empowerment Fund: small scale farmers can apply individually or as groups. SME financing initiatives including cluster competitiveness facilities. Savings and Credit Cooperatives

### **4.8.5.3 Botswana**

Citizen Entrepreneurs Development Agency- Young Farmer's Fund. National Development Bank. First National Bank: have started financing agricultural projects. Savings and Credit Cooperatives involved in supporting farmers

## **4.9 Rules and Regulations (Legislation)**

Legislation governing production of crop seeds, crops, processing, marketing and consumption (enforcement of the food standards often targets the informal ILV vendors) should support the growth of the horticultural sector including ILVs. Certification of ILV seeds, lacking in the policies, should feature in the seed acts or regulations.

### **4.9.1 Institutional Support**

#### **4.9.1.1. Training**

Mainstream issues of ILVs in the Curricula

#### **4.9.1.2 Research**

- Fast track available information/material to the end user
- Material improvement (breeding) of the promising lines and for drought, pests, disease (tolerance/resistance) and nutritional qualities.
- Support researchers to mainstream the generated knowledge and technology to the end users.
- Researchers to continue collecting and recognizing indigenous knowledge and improving on that knowledge
- Protection of our genetic material- build capacity of researchers to deal with Genetically Modified Organisms and their impacts on local germplasm.

#### **4.9.1.3 Extension**

- Participatory Extension Approaches: Farmer Field Schools (FFS) encourage exploratory learning at every stage of production. However, shortage of extension staff is a major challenge. Some experts recommend that the concept of "Training of Trainers" should be adopted.

#### **4.9.1.4 Demonstrations**

- Empower extension to receive and disseminate knowledge and technologies to the end users.

#### **4.9.1.5 Value Addition and Marketing**

- Given the infancy of the industry, public support (access to finance, technologies, advisory services and protection) will still be needed

#### **4.9.1.6 Elimination of tax on ILV producers**

- Eliminate tax on ILV producers as the current tax system, particularly in Tanzania discourages increased production as the more you produce, the more tax you pay.

#### **4.9.2 Market Players**

Producers, processors and sellers should consider value addition through packaging and branding as important undertakings in the value chain with potential to substantially increase the margins at all levels.

#### **4.9.3 Seeds and Certification**

However, certification of ILV seeds lacking in the policies (should feature in the seed acts or regulations).

#### **4.9.4 Government role**

The government should allow recognition of minor crops at macro policy level and allocation of resources at sectoral level.

## CHAPTER FIVE

### 5.0 Increase your Income, Reduce Post-harvest losses of Indigenous Leafy Vegetables

#### 5.1 Introduction

It is evident that ILVs are highly perishable. The high perishability poses major challenges with their marketing and distribution. Practices aimed at minimizing yield and quality losses should be promoted amongst the ILVs producers. The preserved ILVs are meant for home consumption, but some of it is finding its way on the markets. The preserved ILVs do not normally last the entire season. The use of solar driers should be promoted to hasten the drying process and increase the amounts of ILVs preserved. There is need to improve the drying methods that are currently being used taking into account hygienic considerations as well as nutrient degradation and loss. The nutritive value of the preserved ILVs should be investigated with a view to improving the drying processes and minimizing nutrient loss or degradation. There is need to promote the consumption of ILVs amongst the young people by introducing them into their daily meals. This can be done by developing modern recipes for preparing ILVs and share the information in like manner as those described in Chapter 2. The private sector should be encouraged to venture into the business of vegetable processing so as to encourage rural farmers to produce more ILVs. Harvesting during the cooler parts of the day, usually early in the morning should be encouraged. Care should be started at the field in order to reduce injuries and post harvest losses by:

- a. Harvest the vegetables during the cooler parts of the day, usually early in the morning.
- b. Keep harvested ILVs in the shade or shelter or store them in cool places, e.g. charcoal cooler (Figure 31).



- d. Use of clean utensils, clean hands and clean water, and consumption of only fresh ILVs which are in good condition.
- e. Use proper packaging and appropriate transport methods

## 5.2 Preservation of Indigenous Leafy Vegetables (ILVs)

Due to abundance of fresh produce, preservation of ILVs is not commonly practiced. However, some isolated cases of preservation have been observed before sale. The most preferred method particularly in Tanzania is the use of charcoal cooler warehouse. Vegetables stored temporarily in charcoal cooler, have been observed in the market as well. The principle behind the functioning of the charcoal cooler is called “evaporation and cooling effect”. The house is made of wood with spaces in the wall filled with charcoal. The charcoal is kept wet at all times to allow it to absorb heat from the room. Due to evaporation, the charcoal loses absorbed heat and water through small pores in the charcoal to the outside of the shelter,



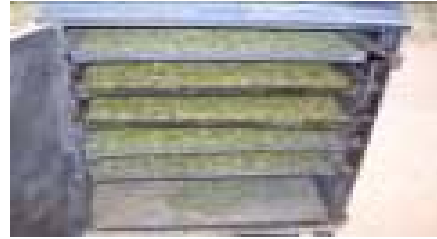
Figure 34. Charcoal cooler for temporal storage

### 5.2.2 Drying

Although direct sun drying has been the most common method of drying ILVs, technologies such as solar driers have been used by individual farmers, farmer groups, farmer organization and cooperatives in Zambia and Botswana. The drying process start from cleaning ILVs, partial boiling in salt water (some ILVs) and then placed in solar drier. Most dried ILVs are cowpea leaves, cassava leaves, pumpkin leaves to mention a few. For the boiled ILVs, water is drained out before placing them in the solar driers or on direct sunshine.



Solar Drier designed and used in Tanzania



Solar Drier designed and used in Zambia



Figure 37: Market of ILVs in Tanzanian Vegetable market

Figure 38: chopping of ILVs ready for sale

## CHAPTER SIX

### 6.0 Further Contributions from the ILVs Stakeholders Workshop

#### 6.1 Policy and market issues

Crop diversification- this strategy which is an important component for addressing food security, improved livelihoods and nutritional value needs of the people to adopt minor crops such as ILVs into account.

#### 6.2 Financial support to farmers

The institutional supports are available to small scale farmers in the three countries of Botswana, Tanzania and Zambia. However, in most cases these initiatives are not specifically tailored to the promotion of production and marketing of ILVs.

#### 6.3 Research

Currently, technology transfer is limited to only a few farmer groups. It was felt that dissemination of these technologies needs to be expanded and broadened. Policy must allow for use of standards that will enable availability of Indigenous leafy vegetable seeds of high quality.

#### 6.4 Extension

The three countries faced a shortage of extension staff. It was observed that elite farmers graduating from Farmer Field Schools could be used as trainers of other farmers. The use of demonstration plots as teaching aids or technology dissemination tools should be encouraged just as other participatory extension tools.

Figure



Figure 39: Stake holders who Participated Regional workshop held in Arusha visited AVRDC

## 6.4.1 Stake holder Workshop Discussion Groups



Figure 40: Policy makers Group discussion during Regional Workshop in Arusha

Figure 41: Farmers group discussion during Regional workshop in Arusha



Figure 41: Farmers group discussion during Regional workshop in Arusha



Fig 42: NGOs, Researchers and Extension officers Group discussion during Regional workshop in Arusha

## **CHAPTER SEVEN**

### **7.0 Recommendations and Way Forward**

#### **7.1 Policy**

Policy makers should support promotion of ILVs and creation of awareness through education, training, nutrition information, curricula, certification of seed particularly for ILVs, and infrastructures in terms of irrigation system, rain water harvesting and roads. It was also observed that harmonization of the projects doing the same activities so that resources could be utilized efficiently was important. Programs should be put in place to show the usefulness of ILVs in the mitigation of HIV/AIDS. Policy should direct the financial institutions in such away that apart from the business they should focus also on helping farmers.

#### **7.2 Market Players**

There is a need of market research on internal weaknesses and strengths and look for opportunities (SWOT analysis) on possibilities of producing seeds for ILVs

#### **7.3 Support Services**

There is need for support services in terms of seeds supply, training, input supply, area of preservation, improved recipes and market information, as well as for promotion of ILVs

#### **7.4 Research and Extension**

Researchers should continue with research in terms of collection and documentation of the ILVs and seed improvement. Extension should be strengthened with emphasis on linkage with research. Dissemination and sharing of available information through demonstration plots, agriculture shows, networking between institution, radio and magazine is essential

#### **7.5 Farmers**

Farmers need information in order to make informed decision before investment to prevent unforeseen losses and disturbances from the unstable market. Farmer Support Units provide an opportunity for easy access and dissemination of information and knowledge to the relevant groups.

## References

- ACT, 2009, Value chain analysis for crops, [www.actanzania.org](http://www.actanzania.org)
- AVRDC, 2007, Recipe of Indigenous leafy Vegetables [http://www.avrdc.org/LC/database/Title\\_view.php?t=1258022450](http://www.avrdc.org/LC/database/Title_view.php?t=1258022450)
- Carter, T.E. and S. Shanmugasundaram, 1993. Vegetable soybean (Glycine). Pages 219-239 In: J.T. Williams (Ed.) Underutilized Crops – Pulses and Vegetables. Chapman and Hall, London.
- Farm Concern International, FCI, The value networks and marketing systems <http://www.familyconcern.net/mod.php?topic=16&cmu=35>
- Farm Concern International, FCI, Market Access for Africa' poor and Commercial Villages Approach <http://www.familyconcern.net/inside.php?articleid=19>
- FAO. 1990. Utilization of Tropical Foods: Fruits and Leaves. FAO Nutritional Paper 47/7. Rome: FAO.
- FAO and WHO, 2008. Publications, however, actual levels of nutrients depend on variety of the crop and agronomic management.
- Germain N. Pichop . 2008. Vegetable farm and agribusiness management and economic decision tools. AVRDC TheWorld Vegetable Centre, Shanhua, Taiwan. AVRDC
- IFPRI, 2001. Empowering women to achieve food security: Vision 2020, Focus No. 6, International Food and Policy Research Institute, Washington D.C.
- IPGRI. 1997. Traditional African Vegetables. Promoting the conservation and use of under-utilized and neglected crops. The proceedings of a conference held by the International Plant Genetic Resources Institute (IPGRI), August 1995, ICRAF, Nairobi, Kenya. 171 pp.
- Maundu, Patrick M.; Njiro, Esther I.; Chweya, James A.; Imungi, Jasper K. & Seme, Elizaphan N. (1999b): Kenya. in: Chweya, J.A. & Eyzaguirre, P.B. (eds.):
- Maundu, P.M. (1997). The status of traditional vegetable utilization in Kenya. In: Proceedings of the IPGRI International workshop on genetic Resources of Traditional Vegetables in Africa, Conservation and Use. ICRAF-HQ, Nairobi: IPGRI.
- The Biodiversity of Traditional Leafy Vegetables. International Plant Genetic Resources Institute, Rome, Italy.
- Kavishe, F.P. 1993. Nutrition: Relevant Action in Tanzania. Tanzania Food and Nutrition Centre Monograph Series No. 1. Dar es Salaam: Tanzania Food Nutrition
- Kean L. G., Nturu, M. K., and B. D. Gijose, 2001. Nutrition briefs; linking multiple sectors for effective planning and programming. SARA/USAID, SANA and CRHCS Project Report.
- Keding, G., Weinberger, K., Swai, I., Mndiga, H. 2007. Diversity, traits and use of traditional vegetables in Tanzania.
- Technical Bulletin No. 40. Shanhua,Taiwan: AVRDC—The World Vegetable Centre. 53 pp.
- Kenneth Y. Takeda K.Y. and R. T. Sakuoka, 1997. Vegetable Soybean. CTAHR fact sheet, Home Garden Vegetable, No. 14, January 1997.
- Shanmugasundaram, S., S.C.S. Tsou and S.H. Cheng. 1989. Vegetable soybeans in the East. Pages 1979-1986 In: A.J. Pascale (Ed.) World Soybean Research Conference-IV Proc., 5-9 March 1989, Buenos Aires, Argentina.
- Traditional food project documents, Farm concern and AVRDC collaboration 2007
- UNICEF. 1990. .Strategy for improved nutrition of children and women in developing countries. (E/ICEF/1991.6). New York: UNICEF.
- WHO, 2000. A global agenda for combating malnutrition: progress report, WHO, Geneva, Switzerland.
- WHO, 2001. Childhood nutrition and progress in implementing the International Code of Marketing of Breast-milk Substitutes. WHO, Geneva, Switzerland.