



RESEARCH ARTICLE

DETERMINING THE COMMERCIAL POTENTIAL OF A NATURAL INDIGENOUS CROP – THE ZAMBIAN TRUFFLE

Alexinah Muyenga and *Biemba Maliti

School of Business, The Copperbelt University, Kitwe, Zambia

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ABSTRACT

The Zambian truffle has not been marketed both locally and internationally despite the product's high marketing prospects. This study was to assess the economic and nutritional values of the Zambian truffle, the marketing activities associated with it, the challenges local traders faced in selling it, its marketing prospects, its other uses and products from it and the strategies that could be employed to grow it. The major finding was that the product had high marketing prospects both in local and international markets. It also had high nutrition and economic values. From it, many products like spices, oil etc can be produced. It also has many uses such as for meals, flavours, seasoning, medicine as well as an export product. But local traders have found it difficult to sell the product even locally because the product was not known. Some suggestions were that the product needed the application of the Marketing mix elements and that there was need to identify a niche market for it. The product needed to be marketed well throughout the country to make it known and needed to be grown on larger scale, certified, processed, packaged and the distribution channels and road networks need to be improved.

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INTRODUCTION

Zambia has many indigenous and exotic products, especially the truffles, which are always bought once taken to markets and other outlets. They are usual considered special foods or delicacies. The product fetches a good price and has great demand elsewhere where its potential has been identified fully. However, in Zambia, where there is so much poverty, this product that can help meet the so much needs of the Zambian people is not known. Its nutrition and economic values are not known. Zambia is very rich in plants and natural resources with rich soils and forests in which lies so many of these products. Under the rich soils in some parts of Zambia, specifically in the Western Province, lies this product known as the truffle. This is the Zambian truffle which is not known by most people of Zambia even to some of those that are born or come from the Western Province. This product is in the group of fungi and a fungus is a plant without leaves or flowers that grows on other plants or on decayed material (Allen, 2007:243). Others define a fungus as a type of plant without leaves, flowers or green colour that grows especially in wet conditions or on decaying matter.

Sutton (1998:8) looks at fungi to be eukaryotes that have cell walls made strong by chitin. The body, called a mycelium is made of threads called hyphae. They have a cell wall around them but only sometimes cross-walls which divide them into distinct cells. Thus, fungi are heterotrophs that grow through whatever they feed on. Webster (1993:1) looks at fungi as being as ubiquitous as parasites or hyperparasites. Ogunlade (1970:229) explains that they depend on organic food that is readily made food from other organisms. As they grow through their food, the tip of each hypha sends out enzymes which digest the food and material on which the plant is growing. The products of digestion are then absorbed and used by mucor to make more of its own protoplasm, so bringing out growth and multiplication. The Zambian truffle is an underground mushroom commonly found under the soft sand soils and near open forests of Miombo-Kalahari woodlands, to be specific in Western and probably North Western Provinces. It belongs to the group of other truffle varieties like the French truffle, Germany, Namibian truffles etc. The truffle has a special aroma which makes it to be unique from any other kind of mushroom.

Natural Distribution of Mushrooms

Webster (1993:1) still observes that fungi's distribution is cosmopolitan. Ogunlade (1970:230) looked at distribution as

*Corresponding author: Biemba Maliti

School of Business, The Copperbelt University, Kitwe, Zambia

by dispersion when ripe though most are lost as they are too small. Each germinates into a single hyphae ending in a sporangium of the asexual type. Ogunlade (1970:231) states that mushroom, toad stools and moulds are very common fungi as there are thousands of each kind of them. It is among the group of fungus that truffles are found. Truffles are a form of subterranean fruit bodies in which the hymenium is not open to the exterior. Truffles, just like any other fruit body, have strong smell and flavour. These are thus excavated and eaten by animals such as squirrels and rabbits and it is therefore possible that dispersal is brought about in such a way (Webster, 1993:384). The truffles are associated with certain species of trees e.g. the oak, in France. The truffles are cultivated there by growing the appropriate species of oak and the crops of truffles will then develop after about seven years. These are then collected with the aid of trained pigs or dogs that are able to detect the fruit-bodies by their smell. Also the skilled truffle collectors can detect the position of truffles, guided by the truffle flies that seek out the fruit bodies.

A truffle is the fruiting body of an underground mushroom usually found in close association with trees. It goes on to state its types as being white truffle and black truffle, though many other species exist (Plates 1 and 2) (Wikipedia, 2011:1). Truffles are a fungus that grows under the ground and is very expensive to buy because people consider it a special food (McMillan, 2002:1542). The Zambian truffle is a seasonal product known by some local people where it is usually found. The period between March and June is the time when this product can be harvested. It is usually found under soft soils and at times buried under the trees beneath the soils. This product can be identified by a small crack in the soil or just very soft soil. Small animals like rabbits and squirrels also may give directions to locations of this product. This product has very nice strong smell, but can easily get bad if not kept well. The dish that is prepared from it is very nice and can cost a very good price.

Truffle Economic Value

In the life of animals, especially man, fungi are of great economic importance. In agriculture, fungi brings about the process of decay of dead plants and animal materials which makes the soil fertile for future growth of plants as they release and break down the carbohydrates and proteins they contain. Truffles are very highly valued products with very significant economic value. In Italy, the white Italian truffles are highly cherished. In a white truffle market in Alba, which is busiest in October and November, these truffles were sold, as by November 2009, at \$ 150 000, and by December 2009 at £10 200 per kilogram. There was also a record price which was paid for a single white truffle as at December 2007 when a casino owner paid \$330 000 (£165 000) for a white truffle specimen weighing 1.5 kg. Another purchase was recorded in November 2010 when a Chinese paid \$330 000 for a pair of white truffles (Ladepêche and Jean-Michel, 2009), in Wikipedia (2012:2). In France during the month of January when black truffles have their highest perfume, they were sold for £1000 per kg in a farmers' market and £3,940 per kg in a retail shop.

Truffles are used as oil, vodka, medicinal mushrooms, and in culinary (Patterson, 2007) in Wikipedia, 2012:7). In Zambia, where truffles are found, they are just used as relish. However, this is a very important product that if marketed well, can increase people's incomes, like the suppliers. Hotels and lodges can include it in their menus and since it is one such rare product, it can fetch high prices that will then increase their returns. The fact that this product is not known by most people makes it to be neglected. Also it is true to say that, the commercial uses of this product are not known. People do not know that they are actually sitting on a gold mine. This study hence will like to bring this awareness in organizations that are able to use the product through the marketing activities. They need to know that the product is actual a rare and yet valuable one just as observed in other countries where it is used. This product should become known to most people especially those in the food industry like hotels and lodges as they seem to have no or little knowledge about its existence. But just building a product may not result in a company's success as the same has to be marketed to consumers in a responsible way before its full value can be realized (Sommers and Barners, 1992:10). However, the problem is how the Zambian people can taste this product or the hotels, lodges and restaurants serve this dish when this product is not made available to them. Its nutrition and economic values are not known by most people, especially those in the food and hospitality industry.

The Role of Marketing

Marketing plays a very important role in the economy of every nation world over. This is because what builds a nation's economy are the many organisations found therein. These organisations can be profit or non profit seeking organisations but they produce products and services that meet the needs of the people in that nation. "Marketing itself is a system of business action designed to plan, price, promote and distribute want satisfying products, services and ideas to market in order to achieve people's needs and wants" (Sommers and Barners, 1992:5). For these marketing activities to be effective, the marketing mix needs to be observed. This mix includes the product, place, price, promotion, people, process and physical evidence.

The problem

Marketing plays a very important role in all organizations for their growth. Therefore, it is important to note that there are a lot of marketing prospects for these Zambian indigenous and exotic products especially the Zambian truffle. Zambia in particular has many of these indigenous products which are always bought once taken to markets and other outlets. They are usually considered special foods. Truffles are part of them and they fetch a good price and have a great demand elsewhere where its potential has been identified fully. However, in Zambia, where there is so much poverty, this product that can help meet so much of the needs of the Zambian people, is not known. Its nutrition and economic values are not known. This lack of economic exploitation of some indigenous crops in Zambia has been called as the maize syndrome whereby

people only focus on cultivating the maize crop even though the payback is minimal (Maliti, 2015). For this product to be valued in other countries like France, China and Italy etc, it means the nationals there had identified its importance. This identification only came about because the marketing activities were carried on well and accordingly. However in Zambia, this does not seem to be the case. There hasn't been much awareness about the product in the market. Most organizations and individuals do not have much information about the product. They have not yet identified its values. It should be noted that people and organizations only get interested in something that has direct benefit and value to them. Thus the marketing of this product should bring many benefits to different circles of the nation. If in other parts of the world there has been a breakthrough in the marketing of this product, then this should be motivation enough to try and find out the possible solutions in the marketing of the product. This study therefore, wishes to examine the marketing prospects of the Zambian truffle both locally and internationally, which can bring out its values. It also seeks to identify the challenges the local suppliers found in selling the product. It will also identify the products that can be made out of it as well as coming up with marketing strategies that will help in the marketing of the product.

The research looked at the Zambian truffle and its marketing prospects and this was the scope. Even though the product grows in Western province, the study also looked at selected Zambian towns like Lusaka, Ndola, Kitwe, Luanshya and Mongu as these provide a larger market and can help to establish international markets. The many hotels, restaurants and lodges in these towns do provide the market. This study will be of great use to hotels, lodges, and restaurants because it will make them identify the truffles' economic and nutrition values. The individual suppliers will be in position to increase their production and capacity to produce it all year round.

Literature Review

Introduction

There is a very large market in the world today which everyone is free to enter and sell as long as one is able to overcome the obstacles that could be there. This is because markets now stretch across international boundaries where distributing channels are becoming more efficient. The world has many countries that have different climates which makes them to have different resources. It is these different resources that make these nations to survive. This is because they are able to produce different products using the available resources and sell them to other countries that need them. However, for these products to be bought, they need to be made known to other nations so that those interested can make arrangements to purchase them. For these products to be known there should be some marketing activities to be carried on. Brassington and Pettitt (2003:4) state that, "marketing is the management process responsible for identifying, anticipating and satisfying customer requirements profitably". This is the process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services to create exchange and satisfy individual and organizational objectives.

We can then conclude that there is no product or service that can survive in the market without any marketing activities to further its growth. Therefore, marketing is the backbone of every organization's survival and growth.

The Marketing concept

Gross and Peterson (1987:13) reveal that the marketing concept or marketing orientation is a relatively new philosophy of doing business and an increasingly important one. The firms that advocate this concept attempt to attain the objectives by organizing and integrating all activities around satisfying customers' needs. This is because management realizes that customer satisfaction is crucial or else the company will not achieve its objectives. It is from this concept that each product that is produced needs the support of the marketing activities. Even the local or indigenous products will need to be marketed if they have to be recognized by organizations or indeed individuals. Therefore, the marketing concept means giving customers what they want. Sommers and Barners (1992:14) confirm that a key to effective marketing is a favorable attitude towards marketing on the part of the firm's top executive. This is because marketing starts with top management. They are the ones that can provide the required climate, the discipline and the leadership needed for a successful marketing program. Marketing's emphasis was on customer orientation and coordination of marketing activities so as to achieve the organization's performance objectives. Szmigin (2003:9) considers that, if marketing has to be effective, there is need for it to be consumer oriented. This is because a shift should be there from product or sales orientation to greater customer focus. This is what has indeed brought in relationship marketing. Therefore, relationship marketing concepts suggest not having a narrow transactional and one-sale-at-a-time view of marketing but that marketing should emphasise the relationship between the organisation and its markets being much stronger. The emphasis should be on customers' needs satisfaction since a satisfied customer will always remember to return as the past has been a pleasant one. Having so many of them returning means the firm has generated its profits and met its objectives.

The Marketing Mix

Gross and Peterson (1987:17) identify the marketing mix as the various marketing activities used by a given firm to serve a target market. These are the four Ps, namely, product, price, promotion, place and planning. Drummond and Ensor (1999:155) explain that, the 4 Ps are a framework offered by internal marketing in its simplest form which lay the foundations of successful policy implementation. Therefore, proper combination of the marketing mix is very important in the achievement of the organizations goals.

Product: A product is a set of tangible and intangible attributes including packaging, colour, price, quality and brand plus the services and reputation of the seller. A product may be a tangible good, service, place, person or idea (Sommers and Barners, 1992:253). It has to stand out with its characteristics that will seem to attract customers because customers always

look for those attributes that seem to add value to whatever they purchase.

Place: Place is all about distribution of the product and making it available to the people that need it. It therefore calls for selecting an effective channel of distribution. So it is all about the distribution system to ensure that the product reaches the people in all the places they are found. Sommers and Barners (1992:442) explain that distribution's role within the marketing mix is getting the product to its target market where the overall responsibility rests with the distribution channel. Thus we see some middlemen taking up some of the roles.

Price: According to Sommers and Barners (1992:369), price is the value placed on goods and services. It is the amount of money and or products that are needed to acquire some combination of another product and its accompanying services. It is considered by many to be the key activity within a free enterprise system. The pricing structure is that which equates the value customers see in the product. It should be able to recover the cost and bring profit to the organisation.

Promotion: Sommers and Barners (1992:541) state that promotion is the design and management of a marketing subsystem for the purpose of informing and persuading present and potential customers. Promotion is the element in the organisations marketing mix that serves to inform, persuade and remind the market of the organisation and its products. It is an attempt to influence the recipients' feelings, beliefs and behaviour. Thus, promotions are activities designed to bring awareness to the market about the products or services, i.e. their availability. This awareness is what brings the purchase.

People: These are the ones that perform the activities for the provision of the products or services, e.g. sales persons, accountants, marketing managers, etc. They are thus very important in as far as provision of goods and services is concerned.

Process: This is a way of carrying out the procedures, operations, policies and flow of information concerning the product or service. From production up to when customers access them. In short, we can say it is about planning.

Physical evidence: This is all about what people are able to see and by such recognise an organisation. The painting of buildings in the colours of various organisations is one such example. When most companies paint retail shops with their colours, it is all about making people being aware about their presence. These organisations want people to know about their existence. Wood (2004:272) adds the fact that having a well blended marketing mix is important for customer satisfaction. There is need to identify how pricing is likely to influence customer expectation of the product or service. Hisrich and Peters (1984:77) observe that the marketing mix describes the interaction of four factors that represent the core of the firm's marketing system which are the product, pricing, distribution and promotion. Thus each of these factors varies in its importance, depending on the industry, corporate mission, objectives and goals or size of the firm. Within each of the four factors are other many variables such as packaging, design,

product development etc. which are designed to meet the needs of customers. They state that "marketing activities are the answer that will help to bring up the segmentation of the market that in turn brings up opportunities". It is through the proper use of one of the marketing mix elements, distribution, that products reach both local and international markets.

The importance of marketing strategies

Drummond and Ensor (1999:2) look at strategy as being concerned with making of major decisions affecting the long term direction of the business. A strategy is just a set of activities put or established by an individual or organization so as to achieve the intended goals. It is that which will help one to reach the destination and how they reach there. Wood (2004:6) identifies an organization strategy as one that governs the organizations over all purposes and its long range direction and goals as well as establishing the range of business in which it will compete and shape how value for customers and other stake holders will be created. The marketing strategy is therefore used to determine how the organization or business unit will use the marketing mix tools of products, promotions, place and price to compete effectively and meet the objectives. The starting point for any marketing strategy that might be developed is the mission statement that points out the organizations purpose and showing the way towards a future vision of what an organizations aspires to become, e.g. customer focus, value creation for customers, market scope, guiding value (for employees and managers in decision making) and core competencies (what the organization has so as it achieves the competitive advantage). Van der merwe (2004:134) also confirms that, there was need to have a good marketing strategy and if implemented well the result will be a win-win situation that will bring customer satisfaction.

Marketing of Local or Indigenous and Exotic Products

The word indigenous means something that has its origins within the place or nation, not coming from another land. Indigenous plants are plants that belong to a region because they developed there. It is important that these indigenous products are marketed locally as well as internationally. In the local markets within Zambia's different areas, a lot of indigenous products can be found. These are usually sold at very cheap prices depending on the value that the locals there place them. Some of these products are sold to further markets in some parts of Zambia. However, most of these products found in other parts of Zambia are not known to other parts. It is not really the entire country that can taste products that may come from other parts of the country because Zambia is so vast and has different indigenous products. "We can accept that Zambia is an extremely rich country with fertile soils, minerals, plants and species, warm welcoming people and communities and yet Zambia is also poor" (Nyirenda *et al*, 2006:9). It is poor because it lacks vital information that would be of great help to most Zambians. This is because if this information was made available, most of these indigenous products in Zambia could be known from different areas. This means that products that are found in Luapula could also be found in the other Zambian markets of Southern, Western, Copperbelt provinces, etc. People within various parts of

Zambia could appreciate what is found in other parts of the country, that which is really theirs for it is indigenous and having no foreign origins. Therefore, if the people can have this information locally in all the Zambian markets and make choices which will satisfy their needs, then eventually foreign markets will get this information. This will be the best way to enter foreign markets and have additional profits apart from what is obtained locally, thus having a share of the global market.

The American Marketing Association (2012), in Wikipedia (2012:1), explains that it is marketing that is used to identify the customer, satisfy the customer and keep the customer. That is why there is need to adopt marketing strategies that will help organizations to identify and meet the needs and wants of their customers and at the same time stay profitable. This is what local suppliers in various parts of the country need. Thus most of the indigenous products that are available in Zambia are highly rich in nutrition. Others are cures of many diseases indeed. What is required is to provide this information to stake holders concerned so that they can make decisions on the use of these products (Nyirenda *et al*, 2006). The Sub-Saharan farmers have had limited access to capital and market infrastructure (roads, physical market structures, market information and contacts). As a result most farmers are trapped within subsistence agriculture with minimal orientation towards the market. The East Southern African Regions despite them contributing 41% of the GDP in what they produce (agricultural products), they are some barriers for these small farmers that need to be overcome for them to be integrated in the sub-sector which will help them benefit from the emerging markets. Thus most countries in Africa face nearly similar problems in terms of information dissemination as in the case of the Sub-Sahara and East Southern African Regions.

The Zambia Development Agency (ZDA) is trying to help bring the information to the small scale businesses on how they can be in the position to exploit the local and international markets, see (ZDA website, 2012). According to the ZDA website, (2012), ZDA helps maximize the nations' out bound revenue, making people learn how to export, find foreign buyers, carry out market research, price and package products as well as carrying out quality certification. Thus it helps small businesses start up and this therefore promotes economic growth and development through promotion of investments and exports in Zambia. The African Growth and Opportunity Act (AGOA) is a United States Trade Act that significantly enhances US market for 40 Sub-Sahara Africa (SSA) countries that was signed into law on May 18th, 2000. The aim was to provide tangible incentives for African countries to continue their efforts to open up their economies and build free markets (AGOA website, 2012). This means that information is vital if all our indigenous products are to be appreciated. People are dependent upon natural resources for meeting a large number of their basic necessities of life. But there is also the importance of markets where these products are to be sold. Meaning people can have the indigenous products but information of their availability within the market is vital. They contribute significantly to household food security by providing food, medicines, etc. Grivetti and Ogle (2000:31)

looked at the importance of edible wild plants and appreciates the role they play in human life of providing nutritional quality of traditional diets in addition to providing medicinal use. Most of these foods are served during the time before harvests and civil unrest and yet people have lived on healthy. This confirms the importance of indigenous foods everywhere. Most of which are good snacks for children of different ages. Nyirenda *et al* (2006: 9) recognize that documentation of the knowledge on the Zambian traditional foods and plants and their uses is of paramount importance as it will widen the food base and preserve good traditional practice for food and non food uses. This will then be used as an early point for promoting the use of indigenous edible plants in the diets of many Zambian households. In this way overcoming the trends of urbanization where healthy life style and traditional eating habits have been lost. Therefore, there is need to have an effective marketing strategy for indigenous products both local and international. Weinberger and Msuya (2004:14) also confirm the importance of indigenous foods to human health, hence the need for their marketing. This means that, the success of promoting neglected indigenous vegetables crops for nutritional health will depend also on strong promotional activities. It states that consumption related information such as medicinal and nutritional properties should be made and proper channel for distributing information used. This is a true confirmation that indigenous products are vital and whose knowledge in people must be provided.

Identifying Zambia's indigenous products

Nyirenda *et al* (2006:19) state that "Zambia is blessed with abundant vegetation, comprising food and non food plants both cultivated and natural. Most of the indigenous plants in the forests are being lost due to urbanization that has come with development. The traditional knowledge and uses of some indigenous plants have been lost due to lack of documentation of these plants and their uses". Therefore, the knowledge on indigenous plants is not documented or passed on to the next generation and the HIV/AIDS pandemic has raised even bigger need for this knowledge, as most of these plants contain high food nutrition and other uses. These Zambian indigenous products are put in the categories of cereals; roots and tubers; pulses, nuts and oil seeds; vegetables; mushrooms; fruits (Nyirenda *et al*, 2006:3). Our main focus was on mushrooms whom Nyirenda *et al* (2006:140) identify as the reproductive structures of fungi. Some of these mushrooms are highly toxic and can lead to fatal consequences when consumed. However, there are many species that are edible. Some of them are so flavorful that they are a major food item and are highly preferred and marketed. Most species of these mushrooms occur in forests and are harvested from there. Generally, edible mushrooms are healthy and rich in good carbohydrates, protein and minerals. A mushroom is a fungus that usually has a short stem and a round top. In Zambia the mushrooms are known by many different names in different parts of the country. The mushrooms usually come in the periods of October to March, during the rainy season. Thus they provide high nutrients for most Zambians as well as income. This is because people go into areas where they are found (forests and plains or valleys) and pick those mushrooms which they identify to be eatable. These are then cooked and used as relish or as a main meal.

Others end up in various local markets where they are sold thus generating income for people (the local suppliers). Mushrooms are thus a ready source of income for the collectors who are mostly women and children. They also improve the diet of the family when they are in season as they are widely consumed by the local communities. What is also important to know is that these mushrooms are not domesticated but picked from their wild environment (Nyirenda *et al.*, 2006:142). Dickinson and Lucas (1982), in Wikipedia (2012:1), describe mushrooms as a fleshy, spore fruiting body of a fungus typically produced above ground on soil or as its food source. Within the many various groups of mushrooms are what are known as truffles.

The Truffles

There are hundreds of species of truffles. Truffles are fruiting bodies of an underground mushroom; spore dispersal is accompanied through fungi ores as well as, animals that eat fungi. Almost all truffles are ectomycorrhizal and are thus usually found in close association with trees (Simpson and Weiner (Eds), 1989) in Wikipedia (2012:1). Siachoono *et al.* (2016:3) states that truffles are a diverse hypogenous group of mushrooms and are found in all continents of the world.

From Emeralds (2012:1), Luciani states that “truffles are nuggets of sublime taste buried beneath the earth”. He further states that “truffles are a type of fungus that grow underground in symbiosis with the roots of certain trees such as beeches, oaks and nut trees”. Shavit and Volk (2007:1) also explain that truffles are hypogenous fungi meaning they form their fruit bodies below the ground. They produce a distinct aroma that grows stronger as they mature. This aroma attracts many animals including humans who collect and consume them.

Truffles are nuggets of sublime taste buried beneath the earth. The truffles are a type of fungus that grows underground in symbiosis with the routes of certain trees such as beeches, oaks and nut trees. A truffle is a type of fungus used as food and as a flavoring (Encyclopedia, 1994:465). Truffles grow underground or near the root of oak or hazel and other trees. They are round or potato shaped and range from ¼ to 4 inches (0.6-10cm) in diameter. Truffles have a firm interior. They may be black, brown, white or other colors. These truffles belong to the family of tuberaceae. Truffles grow wild throughout the world.

Types of Truffles

White truffles: These come from the piedmont region in northern Italy and are most famously in the country side around the city of Alba. They are found during peak period from October to December. For example in November 2009, a 1.6 pound white truffle was sold at \$150,000 and as at December 2009 they were sold at £10,200 per kg. This was in the busiest truffle market of Alba. Karin (2006) confirms this fact in an online article from www.lifeinitaly.com.

The Black truffle: Also known as perygord truffle is named after the perygord region in France and grows exclusively with oak trees. Specimens can be found in late autumn and winter

reaching 7 cm in diameter and weighing up to 100g. The largest truffle market is in south west France at Lalbenque in Quercy. The markets are busiest in the months of January when the black truffles have their highest perfume. As at December 2009 black truffles were sold for about £1000/kilo in a farmers market and £3940/kilo in a retail market (Carluccio, 2003 in Wikipedia).

Chinese truffles: Sometimes called tuber indicum is a winter black truffle harvested in China. Because of their bountiful growth, Chinese truffles are often exported to the west as an inferior quality substitute of tuber melanosporum. The truffles are often sold at a high price. The other type of Chinese truffle is the tuber himalayensis, which is harvested in very small quantities in the Chinese Himalayas due to high altitude. The third type is the Chinese summer white truffle that does not yet have a scientific name (Carluccio, 2003 in Wikipedia).

Summer or burgundy truffle: This is found across Europe and is priced for its culinary value. They are two varieties within the species; the burgundy truffles harvested in autumn until December and summer truffles harvested in summer. This is confirmed by Pettebone (2007) from Info Guru, catalog.com.

Other species: The Oregon white truffles which are found in the US Pacific Northwest are harvested both recreationally and commercially. There is the pecan truffle which is found in the southern United States usually associated with pecan trees. These are very good and have potential as a food commodity thus chefs who have experimented with them can agree to such. These sell for about \$100 a pound and have been used in gourmet restaurants such as Elizabeth on 37th in Savannah (Butters in Wikipedia, 2012:2).

Truffle like species: The term truffle has been applied to several other genera of similar underground fungi. The genera *terfezia* and *tirmania* are known as the desert truffles of Africa and the Middle East (Plates 1 and 2). The Bohemian truffle is found and eaten in German (Ramsbottom, 1953 in Wikipedia).
Truffle Composition

The chemical composition and nutritional quality of truffles of Saudi Arabia, *Terfezia clavaryi* and *Tirmania nivea* are indicated as 19.6 and 27.2% protein, 2.8 and 7.4% fat, 7.0 and 13.2% crude fiber, 4.6 and 5.4% ash and 1.8 and 5.1% ascorbic acid for *T. clavaryi* and *T. nivea*, respectively. Both varieties contained high amounts of K and P and fair levels of Fe, Cu, Zn and Mn. All essential amino acids were present in fairly good amounts. Leucine and lysine were the first limiting amino acids in *T. clavaryi* and valme in *T. nivea*. In-vitro protein digestibility was (82.8 - 86.7%) A similar compositional pattern is expected in all the other mushrooms of the truffle family (Sawaya in Wikipedia, 2012).

Truffle History

Ramsbottom (1953) in Wikipedia (2012:4), states that the first mention of truffles appears in the inscriptions of the Neo-Sumerians in the 20th century and later in writings of Theophrastus in the 4th century BC. In the classical times, their origins were a mystery that challenged many. Plutarch and

others thought them to be the result of lightning, warmth and water in the soil while Juvenal thought thunder and rain to be instrumental in their origin. Cicero also deemed them to be children of the earth while Dioscorides thought they were tuberous roots.

Cultivation

According to wikipedia, the most learned men had thought to have discovered the secret of the truffle seed and were so happy. This wasn't so as their hopes never come to live as no planting was followed by a harvest. However, the conclusion that comes is that truffles can be cultivated as by early 1808, there were successful attempts to cultivate truffles-the French truffles (trufficulture). This arose from an observation that truffles were growing among the roots of certain trees in southern France. This brought the idea to sow some and years later, the experiment was fruitful as truffles were found in soil around the newly grown oak trees. Later in southern France, thousands of truffle-producing trees were planted and production levels reached peaks. All such confirmed that just like mushrooms, truffles can also be planted so as to increase its production. Thus in the last 30 years, new attempts for mass production of truffles started and as a result, eighty percent of truffles produced in France come from specially planted truffle fields (Australia Truffle Growers Association, 2010). This is also proved in New Zealand and Australia, when in 1993, the first black truffles produced in the southern hemisphere were harvested in Gisborne. In 1999, the first Australian truffles were harvested in Tasmania. This was the result of eight years of work. The largest Australian truffle in 2010 weighed 1.084 kg valued at AUS \$1500 per kilo (Australia Truffle Growers Association, 2010).

The Extraction

Truffles are usually extracted from the ground by means of dogs and trained pigs. Also some trained truffle hunters can know where to get them (Simmons, 2009 in Wikipedia). Truffles are not easy to find and thus they are very expensive. Black truffles in Europe were sold at \$350 to \$500 a pound in 1994. These truffles are collected in France and Italy where trained dogs are used. Because of their high commercial value, they are laws controlling their collection. In Italy truffle collectors are tested and licensed. For example there are organizations of land owners called corporative controlled truffle hunting. Unless you are a member you cannot harvest truffles on the corporative truffle beds, otherwise you can be arrested. This shows the significance of this indigenous product (herbarium.usu.edu/fungi/truffind.htm).

Uses of truffles

Truffles have very high price and pungent taste and therefore, they are known for the following uses. Petterson (2007) in Wikipedia, states the following uses of truffles:

Culinary use: The white truffles are generally served raw and shaved over steaming buttered pasta or salads. The white or black paper-thin truffle slices may be inserted into meats under

skins of roasted fowl. There are also some specialty cheeses that contain truffle too.

Truffle oil: Oil can be extracted from the truffle. This is then used as a lower cost and convenient substitute for truffles so as to provide flavoring or just to enhance the flavor and aroma of truffle in cooking.

In Alcohol: Alcohol is now being used to carry the truffle flavor without the need for synthetic flavorings. For example, the first truffle vodka, black moth vodka is natural vodka infused with black perygord truffle. This truffle vodka is thus also used by many chefs to flavor dishes by evaporating the alcohol through cooking whilst retaining the truffle aroma.

- According to an article by Nicholas (2010) in Wikipedia, "Drink infusions from fungi to bile" confirms of how truffle aroma is added to many brands of alcoholic drinks so as to have a unique taste.
- Shavit and Volk (2007:3), explains that the desert truffles are collected for their nutrition value, unique flavor and medicinal properties. Hence the demand for desert truffles in Europe growing. This desert truffle occupies a special niche and benefits from the growing Middle Eastern population in Europe and from the Europeans traditional passion for truffles. Even the pharaohs of ancient Egypt cherished them as food fit for pharaohs. This made them to arrange for large quantities to be brought to their palaces. Even the Roman emperors imported massive quantities of truffles from Libya and Greece.
- While the Beduins of the Niger uses truffles for food as a cash crop and as a medicine for a variety of elements e.g. the juice is used to treat eye infections.
- The desert truffles are nutritious and have high protein and they can be dried and grounded to powder to supplement the regular diet (as a spice).
- Desert truffles can also be baked, sliced and fried in butter. They are then made into soups usually with camel's milk. A very popular dish which is served in most restaurants all over Middle East. These desert truffles are also found in Namibia.
- Therefore, looking at such uses, we can say this product is really an important product to nations and individuals. The countries looked at where this product is found have put up programs to make sure that this product reaches the market within those nations as well as other markets to other countries where the product isn't found. Therefore, this confirms the marketing information about the product being well distributed and the distributing channels being perfect while the price being determined by the demand.

The zambian truffle

The Zambian truffle (Plate 3) just like any other truffle for example the Sub-Sahara and the Namibian desert truffle, is found in areas where the soils are so soft, preferably the soft sand soils of Western province and perhaps Northwestern province. It could also be found maybe in other parts of the country where there is favorable environment. The open forest of Miombo-Kalahari woodlands that spread across the sandy regions of the Western Province and parts of North-western province are the expected habitats for the Zambian truffle

(Naidoo and Mumbwe, 1990:16). These truffles are usually eaten in the areas where they are found by the locals. People who come from these areas and stay in other parts of Zambia may also eat this product. The sand soils of Western province are really production areas of this product. The Zambian truffles are harvested in the months of February, March, April, May, June and probably up to end of July or beginning of August. The peak period usually is March up to June. The local people where the truffles are found are the ones that harvest them and then usually taken to local markets where they are sold fresh. As at now the Zambian truffles are eaten by the locals as relish. These local people buy them from markets and cook them just as they cook any other mushrooms. The collectors of these truffles also eat them as relish, while others sell them so as to raise money which they use for other things.

Sometimes, these truffles are dried so as to preserve them for future use. They can then be cooked by adding groundnuts or just oil and served with the traditional thick porridge called nshima or rice. Zambian truffles brought in these local markets sell so quickly, a thing that shows that they are really a rare commodity liked by most locals. But these truffles are not found everywhere where there is sand soil but there are some areas where they are usually found season after season. This confirms that the surrounding shrubs and soils could be breeding areas for them just like certain types of mushrooms are found in certain seasons. In Western province most rural areas of Mongu, Senanga and Kalabo are common areas where they can be found as long as the right soil (sand) and trees are found. These truffles can be harvested following some leads such as protruding soils and cracks on top of soft soil as one steps on them and also by following places where rabbits and other small animals have dug them. They can be harvested in the morning and afternoon preferably by the experts. However, these days, harvesting of truffles especially in Senanga isn't easy as the locals have seen it to be a very good economic venture and they really would want to prevent any outsider from other areas who would like to harvest them. The local people know about this product and they sell it to local customers that know it at very cheap price. Their market is so restricted as they have no means of marketing the product to other markets. However, they still treasure the product and want only them to harvest and sell it. This is where the resistance comes from.

The Zambian truffles have equally a very unique aroma that makes them to be so unique. Wherever they are, one can tell from the nice aroma that they produce. They thus present a very nice meal to taste especially to the visitors who come to Zambia in various hotels and lodges. However, most of the uses of this product just as seen in various countries where they are found have not been known in Zambia except for them just being used as relish (that is nutrition), as well as being sold so as to earn income. Many differences can be identified between the way the truffle industry is handled in Zambia and other countries. Starting with collecting, you will find truffle hunters using dogs or other trained animals while in Zambia collectors will go only looking for cracks in the soil and for other indicators. This leaves a great chance of not locating most of them. Secondly there are advanced methods

of handling collected truffles like extracting oil from them (later used as a flavor). Also there are good distribution channels that are able to take client's orders and make quick deliveries thus meeting customer needs within and across boundaries. This can be attributed to good communication systems like online orders and other arranged agreements between the suppliers and buyers. As for Zambia better methods of preservation and distribution are goals that should be aimed at to improve this industry.

The Marketing of the Zambian truffle

It is the marketing of the truffle that is able to bring out all its uses, that is the marketing prospects of the truffle. Whatever the type, there are marketing prospects for them and therefore the producers and consumers are able to benefit highly from such. If other varieties have broken through international markets, even the Zambian truffles can break through. The market is not fully congested as this is seen from the price they fetch. If the 4Ps can be applied well and strategies set, then a new level in marketing the product can be reached as awareness is what brings demand in products. The fact that the local people where truffles are found know about the product doesn't mean there has been marketing activities towards the product. This product has to be marketed using the marketing concepts that will fit to be applied depending on the prevailing environment.

If marketing prospects about truffle were brought about in other countries, then even in Zambia this product can be marketed and prospects brought forward. In other countries where truffles are found e.g. France, Italy, China just to name a few, a good distribution network has been established. From the truffle collectors, the product is sent to the retailers who make it available to the consumers (www.wmagazine.com). Also, another strategy employed is that of identifying only a niche market and serving it well. Truffles are bought from collectors and then distributed to organizations (hotels) that needed them. The desert truffles in Africa and Asia also find their way to other countries where there is a good market. This is about distribution of the product (place) and (promotions). The Chinese truffles even though they are looked at as not of very high quality are also being distributed to other parts of the world where they are needed. This is all about distribution. When there is awareness and demand, then a favorable price to enter the market is determined. From there the product's attributes have to be looked at and furthermore, the place which are the distribution channels.

Theoretical and conceptual framework

The Marketing Mix

The marketing of a product in itself is mainly based on the various marketing concepts which include the Marketing Mix. This is fundamental as all the success of the marketing of products and services is based on it. They are the four Ps (4ps) of place, promotion, product, price, and planning. Gross and Peterson (1987: 17) explain that each of these Ps are so crucial to the growth of a product or service. It is all from coming up with a favorable price that will help the new product or service

enter the market as well as existing products stay in the market where competition is. These 4 Ps needs to be applied within the Zambian situation seriously otherwise the product will never be appreciated in Zambia. The study was meant to find out if the marketing concepts that were applied in other countries have also been applied towards the marketing of the Zambian truffle. These concepts are the marketing mix, the (4Ps) and marketing orientation. Therefore, looking at how these theories were used in other countries and evaluating their successes, we will be able to see the gaps towards the marketing of the Zambian truffles and arrive at possible solutions.

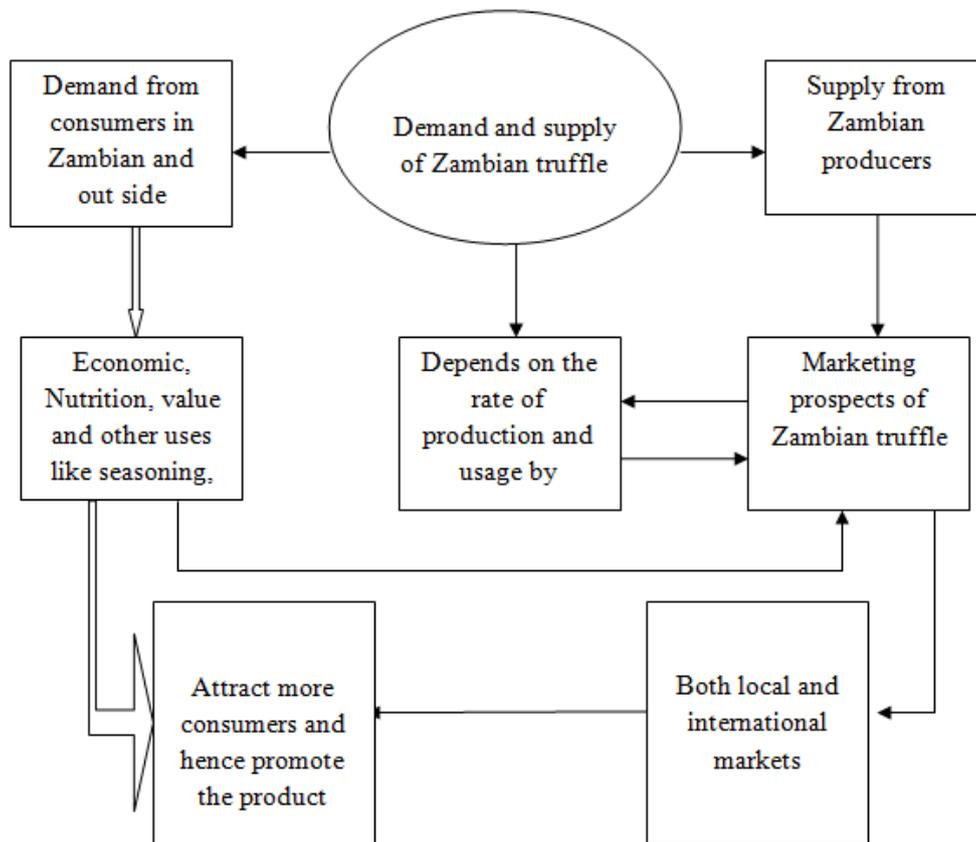
If truffles in other parts of the world (i.e. other varieties) are known, it would be important to identify the marketing concepts that were applied and see if the same marketing theories can be applied in Zambia to market the Zambian truffle so as to achieve the intended marketing objectives. If truffles elsewhere were marketed by the use of these marketing concepts leading to their being known and appreciated, then the same approach can be used for the Zambian truffle situation considering the prevailing environment.

rate of production and usage by consumers. This demand will be derived from the products economic and nutrition values as well as other uses like seasoning and its unique flavour. These values and uses that create this demand will arise from the marketing activities such as promotions, price, distribution as well as the product itself and marketing strategies put up. The supply itself will depend on the rate of production, distribution patterns and other favourable conditions within the environment as already stated. It is the values and uses that will attract more consumers within and outside the country. This is what will promote the product to both local and international markets. Thus the values and uses will raise the marketing prospects of the product locally and internationally. The framework was established by the guide of the research questions.

RESEARCH METHODOLOGY AND DESIGN

Research Design

An exploratory research design was used because there was need to gain the insights and ideas into the whole issue.



Source: Author (2012)

Fig. 1. The Conceptual Framework

The research’s conceptual framework (Fig. 1) was established as follows. In marketing the product, it should be noted that the demand and supply of the Zambian truffle depends on the supply from the Zambian producers as well as the demand that comes from the consumers within Zambia and outside Zambia. At the same time, this demand and supply will depend on the

It is also flexible and helps to discover the general nature of the problem. Hair *et al* (2000: 37) explain that an exploratory research focuses on collecting either secondary or primary data and using an unstructured formal or informal procedure to interpret them thus it is used to classify the problems or opportunities. Therefore, the design helped in increasing

deeper understanding on the marketing of the *Zambian truffle* as a product. This was important since so far there has been no literature on the *Zambian truffle* as there has been no study taken to such effect. So as a way of ensuring effectiveness of the research, both field work and the search on literature review were established. Interviews were also conducted with few persons on the same issue on hand.

Data Collection Method

Primary data was collected by means of questionnaires, personal interviews and general observations. According to Hair *et al* (2000:661), primary data are structures of variables that have been specifically collected and assembled for the current research problem or opportunity situation and they represent first hand structures. Secondary data was collected from available literature relating to the product. However it was not easy to find any literature on the *Zambian truffle* like it is with truffles from other countries because nobody has written anything on the *Zambian truffle*.

Sampling Procedure

The population target was composed of two categories. Category one were hotels of international standards in Lusaka, Ndola, Kitwe and Mongu. Category two was composed of lodges in Luanshya, and Mongu. The distribution of the questionnaire was by identifying the units that were convenient to the researcher. Hence convenient sampling was utilized. All the questionnaires were administered in person by the researcher. The study population comprised the following (Table 1): Lusaka hotels that were selected were 16 and 1 lodge. Kitwe hotels that were selected were 2. Ndola hotels picked were 4. In Mongu, 3 hotels and 2 lodges were picked. In Luanshya 9 lodges were picked. This brought the population to 37. Category one had 25 units while category two had 12 units, making the population of thirty seven (37). From this a sample size of twenty three (23) was selected representing more than 62% of the population.

Table 1. Sample Composition

Category	1	2	Total
No of Units	25	12	37
Units Picked	16	7	23

Data Analysis

Data was analyzed by means of the Statistical Package for Social Sciences (SPSS), i.e. Statistical analysis. Also personal interpretations were made by the researcher from the narrative data collected through interviews which gave much meaning. It was from such that conclusions were made. The sample size of 23 was adequate to give data validity. Primary data that was collected specifically for the study provided reliable information that was recent. Also personal interviews conducted provided accuracy, meaning that the instruments used were consistent, making them to be reliable. Therefore, because of the above, the research brought out the desired outcome, making it to be valid. In terms of ethical concerns, the information collected was treated with the confidence it deserved and was used purely for academic purposes.

DATA ANALYSIS AND RESEARCH FINDINGS

Twenty three (23) questionnaires were distributed and all of them were collected, representing a response rate of 100%. All the questionnaires collected were complete and valid. The data was analysed using Statistical Package for Social Sciences (SPSS). Tables and charts were also used to interpret the results. Also from personal interviews taken, conclusions that were relevant were made.

Economic Value of the *Zambian Truffle*

Findings from personal interviews conducted on the *Zambian truffle* mushrooms revealed that the product has some nutritional values. All the respondents were able to recognise that the product has nutritional contents such as carbohydrates and vitamins that help in growth of human beings. They believed that as long as truffles belong to the group of mushrooms, they will always add great value in terms of nutrition to people that ate them. It should be stated that there were no laboratory tests that were carried so as to confirm the nutritional status of the product. All the 21 responses were based on their own personal knowledge of mushrooms. So we can say these were their assumptions. The findings revealed that 21 organisations confirmed that the product had some nutrition value, giving a valid 91.3 %, while only 1 (4.3 %) said the product had no nutrition value. This answer was based on the fact that the respondent had never prepared a meal from the product or seen the product.

Economic Value of the *Zambian Truffle*

The interviews revealed that the *Zambian truffle* had an economic value and thus it can add greatly to the returns of the organisation(s). The respondents stated that mushrooms were widely used especially during their peak period. Those that have been identified by people as not being poisonous are bought and eaten regularly since most consider them as vegetable meat. For this reason, they are able to bring much income to both organisations and individuals that collect and sell them. Truffles which are so highly valued can bring much more returns. Those that know the product ‘truffle’ confirmed how expensive it was. The *Zambian truffles* as part of the truffle family can never be an exception to this fact. They said the meals prepared from them were so expensive, meaning if they can be found locally, then they can really bring higher returns to organisations as well as improving the incomes of many women and men that collect and sell them. Some respondents stated that a truffle meal can fetch between \$6 and \$15. The results indicate that 20 organisations (87 %) revealed that the product had economic value while 3 (13 %) did not say anything. This confirms that the product has economic value. Respondents that know the product revealed that a meal made out of the product was very expensive. One said even few slices of a French truffle on a meal makes it to cost much more. The none response simply means the respondents had no idea about the product. They don’t know the product. It does not indicate a “no” response. Therefore, if truffles are of such higher value in other countries where they are known, then the *Zambian truffle* has an economic value too. Respondents were

able to identify the fact that the product indeed has an economic value.

The Products from the Zambian Truffle

Every product has its own use, either nutritionally or economically. The Zambian truffle just like any other truffle has various products that can be made out of it. The findings revealed that most hotels and lodges can use the Zambian truffle for meals since a truffle was a mushroom. Thus the truffle can be used in the same way as any mushroom only that truffles possess certain properties that make them to be so unique. Others confirmed using the truffles (in general) for meals, flavours and seasoning. Others also said that truffles can be used for export, medicine as well as spices.

product and this can be confirmed by the fact that very few people know the product. Even some people that live in Western province where the product is found know little about this product. This means selling the product becomes a big challenge for the local suppliers or traders as it is not very known. These traders cannot even open up markets in other parts of Zambia, even worse international markets, as the product was not known by many people. The distribution channel has not yet been established. Therefore, selling the product which is not very known puts a big challenge to the seller(s). The fact that the local traders are so protective about this product does not mean they have no challenges in selling it.

**Table 2. Truffle products
Opinion on use of truffles**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Meals	4	17.4	17.4	17.4
	for export	2	8.7	8.7	26.1
	All	1	4.3	4.3	30.4
	meals,medicine,flavour/seasonin,export	1	4.3	4.3	34.8
	meals,flavours/seasoning,export	7	30.4	30.4	65.2
	meals,spice,flavours/seasoning,export	4	17.4	17.4	82.6
	meals,flavours/seasoning	2	8.7	8.7	91.3
	spice,flavours/seasoning	1	4.3	4.3	95.7
	meals,spice,flavours/seasoning	1	4.3	4.3	100.0
	Total	23	100.0	100.0	

Table 3. Major suppliers for indigenous products with reason for choice

Reasonofsupply * Majorsupplier Crosstabulation

Count	Reasonofsupply	Majorsupplier								Total
		none	local suppliers within province	local suppliers within the country	international suppliers	all	local with provinc.int emational suppliers	suppliers within province,sup pliers within country	suppliers within country, international suppliers	
	none	1	1	0	0	0	0	0	0	2
	availability	0	10	2	1	1	1	1	1	17
	reliability	0	2	0	1	0	1	0	0	4
	Total	1	13	2	2	1	2	1	1	23

Table 2 reveals that 4 people can use the truffle for meals, 2 for export, 7 for both meals and flavours/seasoning, while others said the product can be used for meals only, export only, medicinal, flavours as well as seasoning and spice. This shows how valuable the product was. Most respondents recognised the fact that truffles were used for meals. This means if truffle meals are widely prepared by these hotels and lodges, this could be a good indicator that the product was known since the preparing of truffle meals will only come up if there is demand for them by customers. The table also confirms the same uses of the truffle. The personal interviews conducted also revealed that the Zambian truffles were used mainly for meals, flavours and seasoning and that they can also be exported as whole products or as a processed product (i.e. bottled or tinned). They also said spices can be made from them.

Challenges that Local Traders Find in Selling the Zambian Truffle

The interviews conducted with the local traders of the Zambian truffles revealed that mostly there was no good market for the truffles. There was no proper network for the sale of the

All they know is it has some value they can get from it whenever they make a sale. So they wouldn't want to share this value with any other person. However they have challenges that make them fail to sell the product in other markets in Zambia where they could fetch a good price. Other local harvesters right in the rural areas where there are no good passable roads don't even sell the product. They collect it for meals (relish) only. Those that try to sell have to walk long distances to get to the road where they can get transport to go to town markets and sell it. Otherwise they may stand by the roadsides and try to sell to travelling vehicles. This means if most people knew about this product, traders would follow it from where it is harvested and come and sell it to retail markets. If compared with that for other indigenous products, this shows that indeed there are problems in the supply of the truffle in general and Zambian truffles in particular. The challenges that these traders faced are also an indication that the Zambian truffle as a product has not been well marketed. This means that there has been no or less communication on its availability to the general population of Zambia and to other countries. Its availability has not been made known and that is

why the findings on the suggestions to improve its supply revealed that the product has not been marketed. It needed to be stocked by large retailers to maintain its freshness and it must be grown on large scale so as to improve its supply. Also others felt that there was need to improve the road network as good roads will help in the distribution of the product since the product was found in remote areas. Regarding truffle supply improvements, the survey revealed that the product needed to be marketed, stocked in supermarkets, grown on a larger scale and the road networks needed to be improved. The suggestions revealed that the product was not available, a situation that shows that the product has not been marketed well, therefore, creating a difficult situation for local traders that sold the product. Table 3. reveals that most organisations got their indigenous products using local suppliers within the province and country mainly due to availability. A few may get their supplies internationally. This indicates that if other indigenous products can be supplied locally, then even the *Zambian truffle* could also if marketed well. This may reduce the problems the local traders experienced in selling the product.

not known and thus the local traders really faced problems to sell it. There were 3 ‘no’ responses (13 %) from the local hotels in Mongu where the product was found, representing a very small percentage. When it comes to other indigenous products, there seems to be fewer problems in their supply. Some 13 respondents (56.5%) indicated there had no problems while only 10 indicated ‘no response’ and ‘yes’. In comparison we can say there seems to be more problems in the supply of the truffle than other indigenous products. These problems arose from the fact that the *Zambian truffle* has not been marketed well, bringing problems to local traders in selling it. The result (Table 4) shows that more people demand for mushrooms than that for the *Zambian truffle*. This all confirms that the product is not known which still gives problems to local traders in selling it. This means that they don’t know the product and its uses as well its taste and flavour, showing that there was little information about the product. This confirms how difficult it is to sell the product that is not known in the market due the uncertainty of demand.

Table 4. Demand for *Zambian truffle* against demand for mushroom

Count		Demand mushroom			Total
		none	Daily	once a month	
Demand on <i>Zambian truffle</i>	None	8	7	2	17
	Daily	3	0	0	3
	once in a month	2	0	0	2
	once in a year	1	0	0	1
Total		14	7	2	23

Table 5. Indigenous dishes prepared

Indigenous Dishes		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mushrooms	1	4.3	4.3	4.3
	All	14	60.9	60.9	65.2
	cereals, vegz, mushrooms, fruits	3	13.0	13.0	78.3
	roots/tubers,pulses/nuts/oil seeds,vegz,mushrooms,fruits	2	8.7	8.7	87.0
	cereals,roots/tubers,vegz,mushrooms,fruits	2	8.7	8.7	95.7
	roots/tubers,vegz,mushrooms,fruits	1	4.3	4.3	100.0
	Total	23	100.0	100.0	

Table 6. Knowledge about *Zambian truffle*

Knowledge		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	7	30.4	30.4	30.4
	no	16	69.6	69.6	100.0
	Total	23	100.0	100.0	

In terms of supply problems of the truffle product against other indigenous products, it was found that for those hotels that wanted to make orders concerning any other type of indigenous product they could easily get it. As for truffles, they don’t even know that the product was available in Zambia. So if they want it, they have to struggle to order it from other countries yet this product was available in Zambia and at a reasonable price. All this means the product is not known to organisations and most individuals. One respondent said the truffles they used came from South Africa, while another said they ordered from China. So the 12 ‘non responses’ (52.2 %) and the 8 ‘yes’ response (34.8 %) indicate that the product was

Marketing Prospects of the *Zambian Truffle*

The *Zambian truffle* has high marketing prospects both in local and international markets. However, these can only be realized if the marketing activities were carried on well. If the *Zambian truffle* was marketed well, the demand for it in organisations that needed to use it and individual people is very high. Hotels would like to use it in meals, as a flavour and spice, while others may use it as an export product. Thus it will improve the returns of the organisation as well as individual incomes of its sellers (suppliers). People would need to taste the product also because of its unique taste and nutrition values. Therefore, the

availability of information on this product will make it to break into the local and international markets. The study revealed that there was great demand for mushrooms as a product, even on a daily basis however, when it comes to the Zambian truffle, there seems to be very little or no demand for them. This means that the Zambian truffle was a good product that was not known. Once marketed well, there could be great demand for the product just as it is in other countries. Respondents stated that, since truffles belonged to the mushroom family, it could be a very nice product to eat if marketed. So since there is great demand for mushrooms both locally and internationally, then this demand can also be there for the Zambian truffle. What is just needed is the marketing of the product.

Table 5. reveals that there was more demand for mushroom than for the Zambian truffle. This is because mushrooms are known everywhere in the country and outside the country. Their nutrition values and economic values were known, hence their demand being more. Also there was enough information on them through the marketing and publications of the products. This means even the Zambian truffle can gain the same level of demand and achieve its marketing prospects if marketed. The 'none response' of 17 (73.9 %) just shows how much people did not know the product. Most varieties of mushrooms were known country wide and in other countries. However as for the Zambian truffles, this was not the case due to the non marketing of the product thus hindering its prospects. Table 5 indicates that indigenous products had high marketing prospects. This is confirmed from the information in the table that came from the indigenous meals prepared at hotels and lodges. Among them all, mushrooms were prepared most frequently as in each of the responses they were included. The study confirms mushrooms are found in all the responses. This means they have higher marketing prospects. Therefore, truffles being a family of mushrooms mean they also have higher marketing prospects, basing on the mushrooms demand. In terms of Zambian truffle dishes, the study revealed 16 responses of 'no dishes' made from Zambian truffle. This large figure indicates that the product was not known. However, its higher marketing prospects still stands if marketed just like mushrooms.

The Nutrition and Economic Values of the Zambian Truffle

As a product and a group of mushrooms, the Zambian truffle equally has enough nutrients that play a major role in the human body. When consumed, a person will get the vital vitamins like Riboflavin, niacin, B, D and others. They are also a good source of carbohydrates. Therefore people will not just like them for their flavour, which of course is very unique, but will also for their nutritional endowments. The Zambian truffle has economic value also. The study revealed that nearly every respondent recognised and confirmed the fact that truffles were generally considered to be an exotic food with a high economic value and any mushroom identified to belong to the truffle family should be likewise priced. They based this on the high value of truffle in other international markets, in the same way the Zambian truffle should have a high price. The study revealed that a kilo of Zambian truffle can fetch between

\$5000 and \$20 000. The study thus also revealed that an established market for the Zambian truffle could not only benefit the hotel or food industry and their clients but also the local sellers of this product.

Uses of the Zambian Truffle

The study revealed that just like a mushroom and a family of any other truffle, the Zambian truffle can be used in many ways. The truffle can be exported to other countries as an export and gain a lot of returns from it. All that was needed was just to break into the markets. The truffle can also be used as a spice, as a flavour in meals and as a seasoning. It can also be used as a meal while others felt it could also be used for medicinal uses. The study revealed that the Zambian truffle can also be processed by bottling it, canning it so that it can be preserved and sold in large supermarkets making it to be available throughout the year. All that was needed was just to market the product in the local and international markets and it was at such a point that these various products can be made from it.

Challenges faced by local traders of the Zambian truffle

The study revealed that the local traders faced much challenges in selling the Zambian truffle. These challenges arose from the fact that the product was not known much. Since the Zambian truffles were collected in the remote areas where transport was poor, these local traders relied on small markets that were near. If they were to reach a bigger market or sell by the road sides, they had to cover long distances by foot. Therefore, if most retailers knew this product, they can arrange their own transport and buy from the local traders. Alternatively, if there were good roads, they can still travel to big markets and sell the product. Most respondents expressed their ignorance about the same Zambian truffles while others refused completely that there were truffles in Zambia. Only upon being shown the samples that they believed. This is really what has brought up so many difficulties to the local traders to sell the product. The study revealed that the product needed to be marketed well in all the media so as to create awareness about it. Six respondents that came out prominently in the personal interviews indicated that the Zambian truffles need to be marketed as follows:

- By means of promotions using television and the print media like newspapers. The programmes to market the product can be started in the various local languages that ran on radios. Newspapers can also carry front page adverts of the product.
- Associations of truffle traders can be started that can work together towards the marketing of the product. These can share the promotional costs, identify organisations they can work with in marketing the product and the sponsors.
- Establishing a good distribution channel can also help to market the product. A warehouse can be established where truffles collected can be stored and from there deliveries can be made. Also this distribution can be through a major supplier in similar products supplying larger retail outlets.

- Traders can also introduce this product to various hotels, lodges and restaurants in person and try to supply samples which should be prepared as meals so as to induce the demand for the product.
- The product can be packed well and then distributed to retail outlets.
- The pricing to be determined by demand in the market but a fair price to enter the market can be arrived at.

Thus the majority of the respondents stated that the product needed to be stocked in the supermarkets when packed well so as to increase its availability and freshness. There was also need for the product's production to be increased meaning this should be taken by the government through relevant organisations and other individuals who may be interested in producing it. Other suggestions about minimizing the challenges faced by local traders was the improvement on the road networks. This is because the product is currently found in rural areas of Western Province where no distributing channels have been established and with bad road networks. If there are good roads the product distribution can be improved. However, the major challenge that has been revealed was the lack of information about the product, that is why the suggestions above were brought up in marketing the product. Mushrooms and other indigenous products that were sold everywhere in the country can be taken to any market and yet be sold off with less difficulty. However, the *Zambian truffle* was not much known and as a result there wasn't much demand for the product, posing a very big challenge to the sellers. This obstacle needed to be addressed through putting up marketing activities towards the product as suggested above.

The Marketing prospects of the *Zambian truffle*

The study revealed that, just like any other indigenous products, *Zambian truffles* have higher marketing prospects both locally and internationally. The only reason revealed that can bring up this aspect are marketing activities for the product. Hence, the study showed that *Zambian truffles* can break into the local and international markets. It revealed that if mushrooms and other indigenous products can be sold well in such markets, then also could the *Zambian truffles*. Truffles as highly valued products can break into such markets easily once they are marketed well. The only problem is that their availability is only restricted to where they are found and people have not taken their value highly. Once this is done, the product has higher marketing prospects locally and more so internationally. The study revealed that if people knew about the value of this product new ways and means of increasing its production would already have been looked at and put up by now.

Organisations can set up plants to process them into various ways. For example, they can be bottled or canned for easy distribution and to increase their shelf life. Looking at how this product is valued in other countries, even in Namibia where the *Kalahari truffles* (Plate 4) which are so similar to the *Zambian truffles*, were selling for not less than \$100 per kilo. Thus the marketing prospects of the *Zambian truffle* in both local and international markets were equally high. With this

information, it's up to the *Zambian Government* and individual groups or organisations to find ways and means of promoting this product which has not been appreciated by many people in *Zambia* due to the fact that it was not known.

The Marketing Strategies to be Adopted

From the survey taken, it is evident that a good distribution strategy needed to be adopted. This will help make the product to break into both the local and international markets. A good promotional strategy as well as a good distribution channel would be very helpful in making the product to enter the markets. Establishing a niche market and concentrating on them will make the product grow and yield better returns. The product's attributes like the unique aroma as well as the packaging could help to grow the product. All in all the good combination of the marketing mix would be more ideal. The price to help enter the market can also be arrived at depending on the demand and supply.

Conclusions and Recommendations

Conclusions

The study was undertaken to try and find out the marketing prospects of both indigenous and exotic products in *Zambia*, with the focus on the *Zambian truffle* (*Zoondwe* in *Lozi*). The study also tried to determine the nutrition and economic values of the *Zambian truffle* as well as products that can be made from it and its uses. Also to establish the challenges faced by local traders in selling the product. The findings showed that there was overwhelming evidence that the *Zambian truffle* like any other member of the family of truffles had high levels of vitamins and carbohydrates which can be provided to the body. These are the nutritional values. Also this product had potential for increasing an organisation's returns and an individual's incomes especially the people that gathered the product. This is evident from the responses obtained that acknowledged the high value of this product in comparison with similar truffles found in other parts of the world. The findings also revealed that the product had various uses which included its usage as a meal, spices, flavourings and seasoning, and also as medicine. It can also turned into a big export product from which much more returns could be realised and also that the product can be processed locally by bottling or canning it and then supplying it to the local and international markets. But there were also challenges faced by the local traders of this product in that it was not easy to sell the *Zambian truffle* to other markets within *Zambia*, and even less to other countries. This is seen from the fact that even selling them locally where they are produced is not easy. The major factor to the challenges is the lack of information about the product which is as a result of the lack of marketing activities toward the *Zambian truffle*.

The study showed that mushrooms and other indigenous products can sell well in the markets but not the *Zambian truffle* and the major factor being the marketing of the product. The product is not known by most people. The findings also revealed that most chefs that knew the product didn't have an idea that the product can be found in *Zambia*. One chef at one hotel was able to explain that in the training of their students

where truffles were in the recipe, mushrooms were used as substitutes. This is all because they didn't know the product was available. Another revelation was that so far the product had not been marketed well even where it was found and to interested organisations that could bring up its growth. Additionally, it was revealed that the product had high marketing prospects both locally and internationally as was evident from the other families of truffles elsewhere. It revealed that most people had a lot of demand for the mushrooms and therefore, any product that belonged to this family had a higher marketing prospect in all the markets as well. Further, truffles in particular had their own unique features that made them to be of higher value as compared to any other type of mushrooms. The only problem revealed was that the product had not been marketed at all. Since mushrooms were used for various purposes, then even the truffles had their own uses which included food, spices, medicine, flavourings, seasoning and exporting it.

Thus the findings revealed that if the product was marketed well it would be much easier to enter most local markets as well as international markets too without much difficulty. The interviews revealed that a good combination of the marketing mix such as promotions, establishing good distribution channels as well as product features will greatly bring much awareness to the people about the product. Establishing a good price to help enter the market could be one of the good marketing strategies that can help grow the product too. Additionally, the identification of a suitable niche market to concentrate on could not only bring good returns but also help grow the product. The Senior Researcher in the Ministry of Agriculture believed that the product could actually be produced on a larger scale by using some advanced agriculture technologies. That is, increasing its production levels. He believed that if in other parts of the world truffles were grown, then even the Zambian truffles can also be grown. This fact was also confirmed by a lecturer in School of Agriculture at the University of Zambia.

Recommendations

Having looked at the Zambian truffle as an indigenous and exotic product that has not been marketed in the country well and whose economic values and as well as its marketing prospects in both local and international markets were very high, the following recommendations were derived from the findings of the study:

Implementation of the Marketing Mix: For the Zambian truffle to reach the level at which other truffles in the world have reached there was need to come up and implement a strategy of the marketing mix. Such will help to achieve most of the marketing objectives. There was need to use the appropriate print media, radios, televisions, internet and other means that would help to bring about the awareness of the product. It is this awareness that will help to bring up demand for the product and thus grow it. An identification of a niche market to concentrate on would be ideal to.

Product certification: The product needed to be certified well so as to bring confidence to the customers that buy the

product that it was really a true truffle mushroom as people always have fears of mushrooms.

Processing and Packaging: The product needed to be processed and packaged well within the country. This packaging should be that which will increase its life span and value. This will also help in the easy distribution of the product.

Product distribution channel: There was need to distribute the product to various markets by establishing a good complete channel of distribution from producers (collectors), to processors, retailers and finally consumers. This can be achieved by establishing warehouses where truffles collected are stored before being delivered. This arrangement will make the product to be steadily available. Provision of aids that will enhance the easiness of making orders like phone calls and online orders will benefit the situation too.

Commercial Production: There was need to establish other ways in which this product can be grown on a larger scale using modern agricultural means which will lead to its steady flow throughout. This may also help to bring up the possibility of culturing other varieties of truffles. Interested organisations can take up the challenge.

Other trading incentives: There was need to improve the road networks especially coming up with collecting centres to ease the hardships that suppliers faced. Good road networks will ease the collection of truffles from local traders.

Adoption of good strategies: It is important that good strategies be adopted if the product has to grow to the desired levels that will see it enter international markets. If all these suggestions can be taken seriously, we will see a situation where the Zambian truffle will find its way into hotels, lodges, individual homes and break into the local and international markets. Therefore, it shall achieve its marketing prospects locally and internationally. We will see a situation where various products can be made from the Zambian truffle just like it was in other countries, hence bringing a real breakthrough for the Zambian truffle.

Directions for Future Research

In order to expand on the Zambian truffles as an indigenous product in terms of literature and awareness, future researches can be conducted by any interested organisations or individuals. Some suggested topics for study could be:

- **International marketing of the Zambian truffle.** The main aim would be to try and see how well the Zambian truffles can be marketed to other countries by looking at the best strategies to employ.
- **Looking at the effectiveness of the distribution of the Zambian truffle.** To bring out problems of how truffles are distributed especially locally. .
- **Assessment of the promotions of the Zambian truffle.** As a new product in the market, the study could look at the promotion programmes that were put up and see if they helped meet the marketing objectives of the Zambian

truffle and then arrive at best solutions if problems were encountered.

- **Benefits of large scale growing of the *Zambian truffle* and other truffle varieties.** This study will actually indicate if at all the marketing of the product had been effective.

REFERENCES

(herbarium.usu.edu/fungi/truffind.htm).

“Northeast growers break record with 1084g truffle find”. Retrieved 20th January 2012 from <http://www.examiner.com.au/news/local/news/business/northeast-growers-break-record-with-1084g-truffle-find/1869406.aspx>.

Africa Growth Opportunity Act, Retrieved 20th February 2012 from www.agoa.org

Allen, R. 2007. Oxford Learners Dictionary, Oxford Printing Press, United Kingdom.

Benjamin, D. R. 1995. "Historical uses of truffles", *Mushrooms: Poisons and Panaceas — A Handbook for Naturalists, Mycologists and Physicians*, New York: WH Freeman and Company, pp. 48–50.

Brassington, F. and Peltit, S. 2003. Principles of Marketing 3rd Edition, British Library Congress Cataloging, England.

DCHA/FFP, AFR Bureau teams and USAID/W 2003. Analysis of food security, Health and Nutrition in Zambia, USAID Zambia.

Donnelly, H. J. and Peter, P. J. 2004. Marketing Management 7th Edition, McGraw Hill, USA.

Drummond, G. and Ensor, J. 1999. Strategic Marketing: Planning and Control, ButterWorth-Heinemann, Linacre House, Jordan Hill, Oxford.

Grivetti, E.L. and Ogle, M.B. 2000. Value of Traditional Foods in meeting macro- and micro nutrient needs, the world plant connection, Department of nutrition, University of California, USA.

Gross, W. and Peterson, T. 1987. Marketing: Concepts and Decision Making, West Publishing Company, St Paul, USA.

Hair, J.F. jr., Anderson, R. E., Tatham, R. L. and Black, W. C. 200. Multivariate Data Analysis, Fifth Ed., Prentice Hall, Upper Saddle River, New Jersey, USA.

Hisrich, D. R. and Peters, M. P. 1984. Marketing Decisions for New and Mature products: Planning, Development and Control, Charles E Merrill Publishing Company, Columbus, Ohio, USA.

Identifying mushrooms, Retrieved 20th February 2012, from <http://penshrooms.org/>

Luciani, N. 1989. Mystical truffles-Nuggets of Sublime Taste Buried beneath the Earth, British Food Journal, London.

Maliti, B. 2015. Applying the Action-Profit Linkage Model in a Developing Nation, Scholars’ Press, Germany.

Mukherjee, N. 2009. “Composition and health benefits of mushrooms”, Retrieved 10th April 2012 from <http://nitamukherjee.suite101.com/composition-and-health-benefits-of-mushrooms>.

Naidoo, M. R. and Mumbwe, J. 1990. A Secondary Geography of Zambia. Longman group Ltd, Hong Kong.

Nicole, M.M. and Thomas, J.S. 2009. Staple food consumption patterns in urban Zambia; results from the 2007/2008 urban

consumption survey, Retrieved 20th February 2012 from <http://www.acc.edu/agecon/>

Nyawangah, O. 2008. Mushrooms: a source of wealth in Rural Tanzania, Retrieved 20th February 2012, from <http://www.iicd.org>

Nyirenda, B. D., Musukwa, M., Kawana, B., Mugode, R., Tembo, L. I., Epand, R. 2006. Guide to Selected Edible Plants and Mushrooms of Zambia and their Uses, Program Against Malnutrition, Zambia.

Ogunlade, R.A. 1970. A Biology Course for African Schools-2, Hazell Watson and Viney Ltd, England.

Patterson, D. 2007. "Hocus-Pocus, and a Beaker of Truffles". Retrieved 20th January 2012 from <http://www.nytimes.com/2007/05/16/dining/16truf.html>.

Robicheaux, P.F. 1977. Marketing; Contemporary Dimensions, Houghton Mifflin Company, USA.

Schnaars, P. S. 1991. Marketing Strategy: A Customer Driven Approach, The free Press, Division of Macmillan, 866 3rd Avenue, New York.

Shavit, E. and Volk, T. 2007. Terfezia and Tirmania Desert truffles, Retrieved 20th February 2012 from www.tomvolk.net

Simmons, K. 2009. "On the hunt for truffles in Western Australia". Retrieved 20th January 2012 from <http://travel.latimes.com/articles/la-trw-truffles30-2009aug30>.

Smith, I. 1994. Meeting Customer Needs, British Library Cataloguing, Britain.

Sommers, S. and Barners, G. 1992. Fundamentals of Marketing, 6th Edition, McGraw Hill, USA.

Sutton, J. J. 1998. Biology. McMillan Publishers UK.

Szmigin, I. 2003. Understanding the Customer, SAGE Publications Ltd, London.

The World Book Encyclopaedia, T. 1994, Library of Congress Catalogue, Vol. 19, USA.

Truffle Vodka article Retrieved 20th January 2012 from <http://www.mycorrhizalssystem.com/vodka-natural-way-tatse-truffles>

Van der Merwe, S. 2004. Breaking Through; Implementing Customer Focus in Enterprises, Palgrave Macmillan, Britain.

Webster, J. 1993. Introduction to Fungi, 2nd Edition, Press syndicate, Great Britain.

Weinberger, K. and Msuya, J. 2004. Indigenous Vegetables in Tanzania; Significance and Prospects, World Vegetable Centre, Taiwan.

Wikipedia, Retrieved on 9th August 2012, from <http://en.wikipedia.org/wiki/truffle>

Wikipedia, Retrived in 2011, from <http://en.wikipedia.org/wiki/truffle>

Wikipedia, Retrieved on 20 February 2012, from <http://www.wikipedia.org/wiki/mushrooms>

Wood, B. M. 2004. Marketing Planning: Principles into Practise, Pearson Education Ltd, Essex CM20 2JE, England.

Zambia Development Agency, Retrieved 20th February 2012 from www.zda.org.zm

Siachoono S, Shakachite O, muyenga A.M, Bwalya J. 2016. Underground treasure: A preliminary inquiry into the ecology and distribution of the *Zambian Truffle*, Canadian center of science and Education, Canada

APPENDIX

The Truffles



Plate 1: www.luxique.com (2012)

Plate 2: Namibian Kalahari truffle
[gastronamibia \(wordpress.com, 2012\)](http://gastronamibia.wordpress.com)



Plate 3. Miombo Kalahari soils in Zambia and the Zambian truffle
