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## **Farmers Empowerment through Agricultural Marketing. A case of KOABIBIKA Cooperative (2015- 2019)**

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### **ABSTRACT**

This research assessed “Farmers Empowerment through Agricultural Marketing. A case of KOABIBIKA Cooperative (2015- 2019)” operating in Rubengera Sector, Karongi District, Western Province of Rwanda. The research analyzed the evolution of productivity of maize and beans in KOABIBIKA; it analyzed post- harvest processing techniques used; it assessed storage mechanisms for maize and beans; it outlined the sources of market information and distribution channels used by KOABIBIKA. It ended by determining challenges to agricultural marketing faced by KOABIBIKA. The research used a mix of quantitative and qualitative approaches where numerical data was collected through a questionnaire designed in form of four levels Likert scale and analyzed using IBM SPSS Statistics 23; Non- numerical data was collected using open questions in the questionnaire; structured interview; and participant observation. The total population of the study was 782 members of KOABIBIKA including 439 men and 343 women. A sample of 87 key informants was determined using Yamane’ formula; and respondents were selected using simple random sampling technique. Reliability test was conducted through piloting survey conducted on 10 members of Cooperative planting Coffee in Bwishyura Sector; and the Cronbach’s Alpha coefficient found was .912 or 91% meaning excellent reliability. Main findings of the research are the following: The production of Bush and Climbing beans combined is estimated at an average of 365 tonnes per year. Maize alternate with beans over an area of 173 ha. The production of maize is averaged at 667 tonnes per year. The main factors affecting productivity include: Use of fertilizers (4.00); use of improved seeds (4.00); trainings (4.00); efforts targeting needs of the customers (3.55); and use of irrigation (3.00). The research found that there is not post- harvest treatment (no adding values mechanisms). The production is stored using public stores (4.00). The sources of information about markets is poor: it is provided through the phone (4.00); meeting (4.00); internal marketing office (4.00); dealing with local markets (4.00); and local Middlemen (4.00). KOABIBIKA has poor marketing strategies: It does not advertise in media (1.00); not use internet such as websites, twitter, watsapp, etc (1.00). The product is sold locally to schools (4.00); to local village customers (4.00); to local market (Rubengera market) (4.00); and to Middlemen Urban traders (from Kigali, Muhanga, Huye cities) (4.00). KOABIBIKA uses motor vehicles to transport the harvest to the store and the markets using tarred and bumpy roads (4.00). The main challenges include: Lack of adding value technologies (4.00); Poor advertising through radio and TV (4.00); Poor access to market information affecting price (3.00). The research recommends adopting agricultural mechanization; improving marketing strategies; and introducing add- value technologies such as maize mill for making maize flour and improved packaging systems.

**Keywords:** Agriculture, Agricultural marketing, Empowerment, Farmers, KOABIBIKA.

## **1. BACKGROUND OF THE STUDY**

According to the National Commission on Agriculture (XII Report, 1976), agricultural marketing is a process which starts with a decision to produce a saleable farm commodity, and it involves all the aspects of market structure or system, both functional and institutional, based on technical and economic considerations, and includes pre- and post-harvest operations, assembling, grading, storage, transportation and distribution (National Commission on Agriculture, 1976).

Kiruthiga et al. (2015) defined Agricultural marketing as consisting of two major concepts namely “agriculture” and “marketing”. The first concept agriculture aims at producing the agro food products with the use of natural factors for the welfare of human. It is fully depends on natural processing. The second concept marketing refers to the activities that are done by the business organizations to promote their products and services to their targeted customers. In marketing the targeted customers can be attracted and maintained by creating strong customer values for them in the organization. It is possible through, effective market survey, market trending, better customer service and satisfaction, customer focus and continuous follow up. The concept agricultural marketing includes many activities starts from production process till its retailing. The activities involved are production planning, cropping and harvesting, warehousing, grading, transportation and final distribution. There are varieties of agro products which are produced with dual purpose of domestic consumption as well as exporting. In the chain of agricultural marketing number connecting links such as farmers, suppliers, functionaries, importers, exporters, external beneficiaries and customers are involved (Kiruthiga et al. (2015).

The importance of agricultural marketing include: Breaking the vicious circle of poverty; Optimum utilization of agricultural resources; Enhancing the standard of living; Basis of employment opportunity; Basis of industrial development; Basis of foreign trade; Source of national revenue; and Creating the environment for investment (Kiruthiga et al. (2015).

In the framework of the implementation of the 2020 vision the Government of Rwanda has chosen to make rural development and agricultural transformation, to spearhead the embarking on a new era of a quick and sustainable development (GoR, 2000). The Government of Rwanda has initiated Strategic Plan of Agricultural Transformation (PSTA) - a five year program designed since 2004 with ten strategic axes defined on the basis of the orientations of the National Agricultural Policy. The ten strategic axes of PSTA include: (i) diversification and intensification of crop, animal and aquatic production; (ii) diversification of sources of incomes and rural employments; (iii) link of production with market and integration of agricultural economy within the national and regional economy; (iv) sustainable management of natural resources and particularly of water and soils; (v) organization, mobilization and reinforcement of capacities of producers and professional organizations; (vi) reinforcement of service providers’ capacities, privatization and private sector promotion; (vii) creation of a conducive institutional framework for producers’ professionalization and agricultural transformation. (viii) creation of a conducive environment, favorable to productive investments and to entrepreneurship and employment development in agribusiness; (ix) redefining the role of MINAGRI and the restructuring of its actions towards the sector program approach within the

decentralization framework; (x) promotion of gender approach and reduction of vulnerability of underprivileged groups (MINAGRI, 2004).

Strategic Plan for the Transformation of Agriculture in Rwanda Phase III (PSTA III) aimed at the intensification and commercialization of the Rwandan agricultural sector will be essential to reduce poverty and drive growth over the next five years. The new economic and poverty reduction strategy, EDPRS II, prioritizes rural development and embraces the sector as a source of jobs and economic transformation. The strategic vision for the next five years is a focus on both increased production of staple crops and livestock products, and greater involvement of the private sector to increase agricultural exports, processing and value addition. Investing in high-value crops while also exploiting the opportunities offered by staple crops is key for the future, facilitating both domestic food security and higher rural incomes.

In the short term, continued rapid food production increases will ensure further reductions in rural poverty and malnutrition. In the medium term, the goal is to move Rwandan agriculture from a largely subsistence sector to a more knowledge-intensive, market-oriented sector, sustaining growth and adding value to products (MINAGRI, 2018).

The Pillar I of revised National Agricultural Policy (NAP) of 2017 (that revised the NAP of 2004) is about “Productivity and Commercialization for Food Security, Nutrition, and Incomes”. The pillar aims at enhancing the productive efficiency, preventing crop post-harvest losses, continuing increasing the access and use of good quality of improved seeds and livestock breeds, access to quality fertilizers and farm incomes in the future, facilitating better market linkages. In order to improve productivity, increase production and commercialization, and address the challenge of land fragmentation, the policy aims at developing farmer cooperation and continue encouraging farmers’ cooperatives. NAP affirms that strategies need to be directed at improving their knowledge of post-harvest treatment of agricultural products, at increasingly using food preservation techniques (e.g. drying, canning, or small-scale processing in both crops and livestock), and at building storage and cooling facilities, as well as community-based seed banks, in order to limit the reliance on external/hybrid and more cost-intensive seeds, which are often unavailable in the quantities desired. For improving farmers’ access to markets, NAP is convinced that increased access to markets is important to continue driving farmers’ capacity towards high agricultural productivity. The policy is emphasizing the quality of outputs by observing standards that will facilitate all the key players’ access to markets domestic, regional and international. The quality will be preserved from the farm through the promotion and implementation of legislation on mechanization, seed, land, fertilizer and pesticide use/management to ensure that correct agricultural practices are enforced. The policy also found that price of agricultural inputs/outputs need to be stabilized in order to sustain farm income in the short, medium and long-term. The price variability of agricultural inputs/outputs affects farm income and subsequently reduce farmers’ livelihoods (MINAGRI, 2017).

In addition, in 2007, the Government of Rwanda initiated “Crop Intensification Program” (CIP), a flagship program that aims to achieve food security and improve rural household incomes. CIP operates throughout the country and focuses on increasing the production of six priority crops: Maize, Wheat, Rice, Irish potatoes, Beans and Cassava (Cantore, 2010).

For achieving listed targets, the Government of Rwanda promoted farmers cooperatives as a vehicle for the distribution of improved seeds and fertilizers to farmers; to extend training and other capacity building initiatives; providing training on production techniques and post-harvest, as well as literacy training, or business and marketing building workshops. With access to market being one of the most difficult challenges faced by small farmers in Rwanda, the role of co-operatives in helping them to exercise economies of scale is increasingly important. Through co-operatives, farmers can attract traders and institutional buyers, and increase their negotiating power. Cooperatives have also started to emerge in other sectors such as transport or commodity transformation, with people buying trucks and milling machines and starting their own enterprises.

Taking a case study of KOABIBIKA (“**K**operative y’**A**bahinzi b’**I**bigori n’**I**bishyimbo b’i **K**arongi” (Cooperative of cultivators of Beans and Maize of Karongi)), a farmers’ cooperative founded in 2013 and promoting two priority crops: Beans and Maize in Muremera Village, Gitwa Cell, Rubengera Sector, Karongi District in Western Province in Rwanda, the present research aims at assessing how agricultural marketing empowers farmers.

## **2. RESEARCH PROBLEM**

Since 2004, the Ministry of Agriculture and Animal Resources (MINAGRI) has developed and implemented three phases of Strategic Plans for the Transformation of Agriculture (PSTA), the main policy framework for agriculture development in Rwanda aiming at harmonizing the agriculture sector development activities with the national Economic Development and Poverty Reduction Strategies and the Vision 2020. The PSTA 4 is the Strategic Plan for the Agricultural Sector covering the period 2018-2024. The PSTA4 is structured around four core pillars: Enabling Environment and Responsive Institutions; Productive and inclusive markets and value addition; Increased productivity, diversity, Sustainability and Resilience of Agricultural production; Research, innovation and empowerment. The overarching goal of PSTA4 is the transformation of Rwandan agriculture from a sector characterized by low productivity to a sector using knowledge to increase productivity and investing in value addition and commercialization. This shift is needed to ensure that a reduced agricultural workforce will be able to meet the demand of an increasingly urban population within the context of a resilient and sustainable food system ensuring food and nutrition security for the Rwandan population.

PSTA 4 is aligned to 2030 agenda for Sustainable Development and upholds the principle of “Leaving no one behind” in this transformation process. It is modeled on needs-based solutions for various groups of farmers and ensures that marginal-subsistence farmers are supported with social protection programmes and other measures in terms of skills development to ensure they graduate out of subsistence farming and into jobs along the agricultural value chains and beyond (from on-farm to off-farm job creation).

Despite enormous efforts of the Government in improving Agricultural sector, daily experience and media including Fortune for Africa list a number of challenges faced by Rwanda farmers to add value to their agricultural products: (1) Low quality produce as most production is intended for own family

consumption hence local farmers do not have strong incentives to increase quality; (2) Lack of business skills and entrepreneurship; (3) The rural road infrastructure and transport is not yet fully developed to enable the farmer to promptly get farm input and also transport the farm produce to the market; (4) There is lack of sustainable market and post-harvest management for the small scale farmers in Rwanda; (5) Limited capital to develop the farms and local farmers also do not have easy access to funding from commercial banks; (6) The latest market information is not readily available to the small scale farmers and this results in the farmers selling at cheap price in order to avoid spoilage of agricultural products; (7) Shortage of fertile land; (8) Lack of knowledge about modern farming methods including irrigation; (10) Lack of necessary equipment to use on the farm during planting, harvesting and value addition; (11) Lack of adequate supporting infrastructure to the sector like cold rooms, advisory services to the small farmers and mechanism for the small farmers to pull resources; (12) Lack of knowledge and financial capacity to handle post-harvest losses, inefficiencies in book-keeping and poor management are some of the main problems still affecting maize farmers; (13) Poor post-harvest handling affects prices of maize produce because when farmers take their produce to clients, they reject it due to its poor grade; (14) lack access to finance, suitable inputs and better cooperative management.

Taking a case study of KOABIBIKA, the present research aims at assessing how agricultural marketing empowers farmers.

### **3. GENERAL OBJECTIVE**

The general objective of the research is to determine the role of agricultural marketing in empowering farmers of KOABIBIKA.

### **4. SPECIFIC OBJECTIVES**

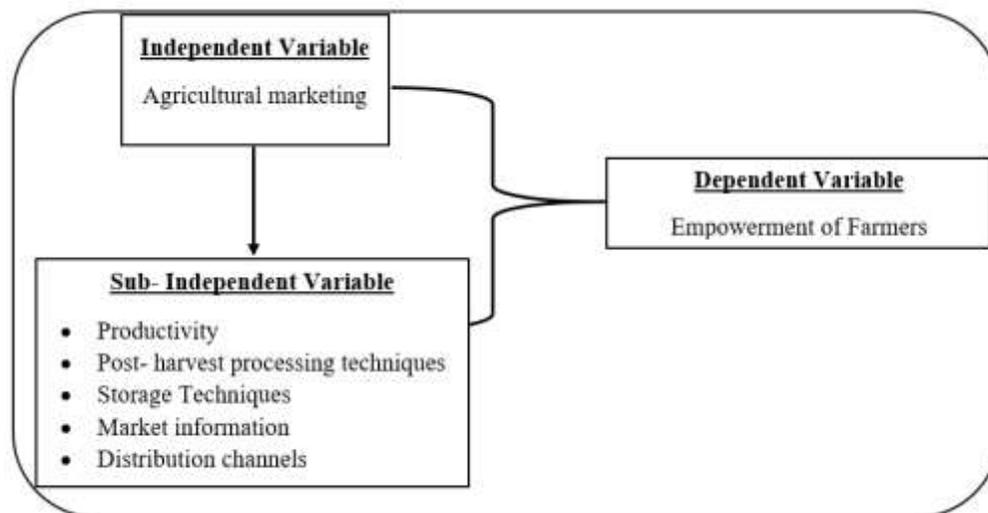
Specific objectives of the research are the following:

- 1) To examine the evolution of productivity of maize and beans in KOABIBIKA.
- 2) To analyze post-harvest processing techniques used in KOABIBIKA.
- 3) To assess storage mechanisms for maize and beans in KOABIBIKA.
- 4) To find out the sources of market information accessed by KOABIBIKA.
- 5) To outline distribution channels used by KOABIBIKA.
- 6) To determine challenges to agricultural marketing faced by KOABIBIKA.

### **7. CONCEPTUAL FRAMEWORK**

This research inspired from the research of Chokera et al. (2014) on the role of agricultural marketing on empowering rural farmers in Masvingo Province in Zimbabwe. Using the same variables as those used by Chokera et al., the research paradigm for this research can be schematized as the following figure 1.

**Figure 1: Research framework**



Source: Author, 2019.

## **8. LITERATURE REVIEW**

### **8.1. Types of cooperatives in Rwanda**

According to RCA (2019), cooperative Organizations may carry out activities in all sectors of economic and social life, and they are divided into the following categories:

- 1) Production Cooperative Organizations;
- 2) Commercial and Consumer cooperative Organizations;
- 3) Savings and Credit Cooperative organizations;
- 4) Services Cooperative Organizations;
- 5) Multipurpose Cooperative Organizations.

### **8.2. Cooperative Structure**

According to RCA (2019), cooperative organizations may constitute among themselves unions, federations and confederation for the better management of their property and the defense of their common interests.

#### 1) Primary cooperatives

This is a primary basic type of a cooperative where members voluntarily decide to gather their thoughts, strengths and assets with the common purpose of maximizing profit through providing any activity.

#### 2) Unions

Three or more primary cooperatives may join together to form a cooperative Union. Such a Cooperative Organization shall be referred to as a secondary Cooperative Organization. Only primary Cooperative Organizations may be members of a cooperative union. No primary Cooperative Organization shall be a member of two cooperative unions at the same time. Cooperative union by-laws shall provide for a delegate representation and the mode of voting in a General Assembly

meeting. A cooperative union may carry out complementary economic and service activities to those of its affiliates.

3) Federation

Three or more cooperative unions may join together to form a cooperative Federation at national level. Such a cooperative federation shall be referred to as a tertiary cooperative organization.

4) Confederation

Three or more cooperative federations may join together to form a cooperative confederation at the national level.

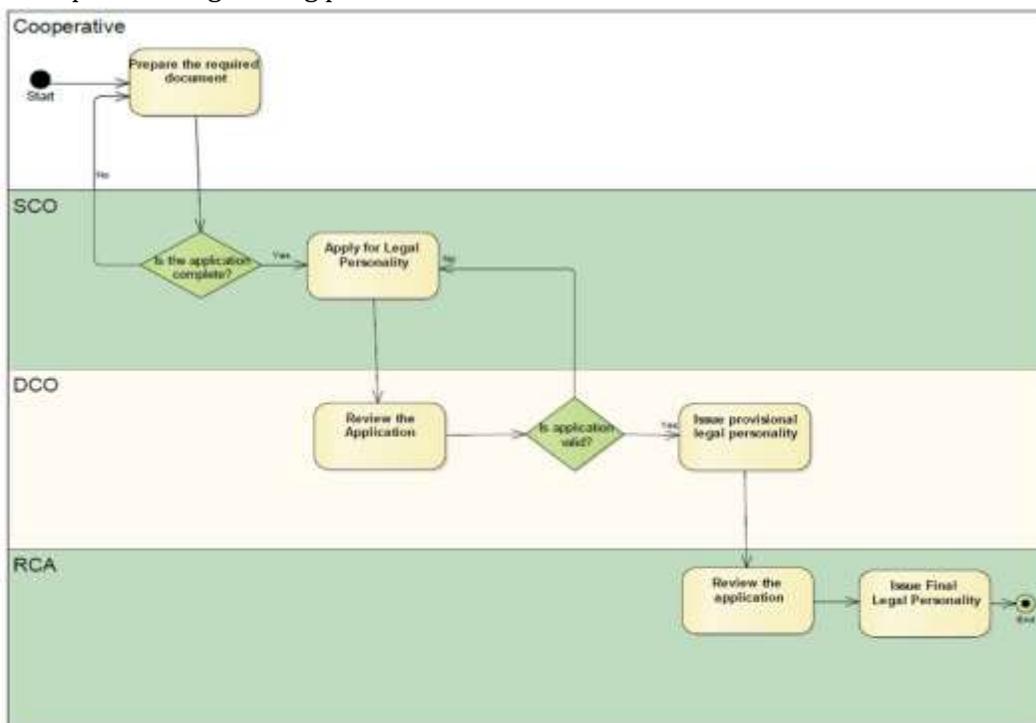
8.3. Cooperative principles

RCA (2019) lists the following cooperative principles:

- 1) Voluntary and Open Membership
- 2) Democratic Member Control
- 3) Member Economic Participation
- 4) Autonomy and Independence
- 5) Education, Training and Information
- 6) Cooperation Among Cooperatives
- 7) Concern for Community

8.4. Cooperative registration process

Figure 2: Cooperative registering process



Source: RCA (2019) [retrieved from] <http://www.rca.gov.rw/fr/shortcut/cooperative-registration>.

The figure 2 above shows that Cooperative registration process comprises the following steps:

Step 1: Cooperative apply for legal personality at sector level.

Step 2: Sector Cooperative Officer (SCO) assesses the application and may decide to visit the cooperative. The sector has 7 days to approve the application.

Step 3: Once approved, the application is moved to the district. The District Cooperative Officer (DCO) assesses (review) the application. If approved, provisional legal personality is issued. The district has 15 days to approve, request further information, or reject the application.

Step 4: After district approval, the application is moved to RCA.

Step 5: RCA request approval from BNR in case of SACCO's application

Step 6: If RCA approve, legal personality is provided, otherwise the application is sent back for rectification. In case of rejection, comment might be provided.

According to RCA (2019), the documents required for applying for the registration of a Cooperative in Rwanda include:

- 1) Constituent general assembly resolution
- 2) List of cooperative leaders (board members, supervisory committee, credit committee in case of SACCO)
- 3) List of cooperative members
- 4) Articles of Association
- 5) Internal regulations
- 6) Proof of payment for registration fees
- 7) Oath of leaders

### **8.5. Current situation of Cooperatives in Rwanda**

Cooperatives in Rwanda are dominated by agriculture (27.5%); livestock (18.37%); trading (13.42%); and service activities (10.09%). The cooperatives in these economic activities totalize Share capital of 19,191,111,839 Frw over a total share capital of 29,662,021,319 Frw for all primary cooperatives operating in Rwanda. The table 1 below outlines details on current situation of cooperatives in Rwanda.

**Table 1: Distribution of Cooperatives according to economic activity at national level**

Economic Activity	No. of Coops		Membership				Total	Share Capital
	No.	%	M	%	F	%		
Agriculture	2433	27.05	179510	60	118486	40	297996	4,878,078,148
Livestock	1652	18.37	46834	51	44923	49	91757	3,991,748,925
Trading	1207	13.42	29507	53	26609	47	56116	8,310,857,882
Service	908	10.09	23077	63	13534	37	36611	2,010,426,884
Transport	542	6.03	21912	89	2731	11	24643	1,764,398,500
Handicraft	979	11	14113	47	16179	53	30292	1,894,282,580
Transformation	98	1.1	3920	60	2648	40	6568	745,505,500
Mining	121	1.34	1971	80	500	20	2471	602,246,100
Fishing	94	1.04	3540	77	1080	23	4620	162,422,000
Housing	160	1.78	4930	71	2053	29	6983	4,803,614,000
Other	498	5.54	5096	63	3047	37	8143	498,431,800
<b>Sub Total</b>	<b>8391</b>	<b>93.3</b>	<b>334410</b>	<b>59</b>	<b>231790</b>	<b>41</b>	<b>566200</b>	<b>29,662,021,319</b>
SACCOs	448	5	1795295	55	1455096	45	3250391	14,403,218,733
Unions	141	1.57						193,166,100
Federations	15	0.17						61,020,000
<b>Grand Total</b>	<b>8995</b>	<b>100</b>	<b>2129705</b>	<b>56</b>	<b>1686886</b>	<b>44</b>	<b>3816591</b>	<b>44,319,426,152</b>

Source: RCA. (2018). Statistics on Cooperatives in Rwanda, Kigali.

### 8.6. Theoretical review: Theory of Marketing Mix 4Ps

Marketing mix consists of a combination of factors that can be controlled by a company to influence consumers to purchase its products. Dominici (2009) described 4 Ps of marketing mix created by E. Jerome McCarthy in the 1960s: Product, Price, Place and Promotion.

#### Product

A product is an item that is built or produced to satisfy the needs of a certain group of people. The product can be intangible or tangible as it can be in the form of services or goods. The seller must ensure to have the right type of product that is in demand for the market.

So during the product development phase, the marketer must do an extensive research on the life cycle of the product that they are creating. A product has a certain life cycle that includes the growth phase, the maturity phase, and the sales decline phase. It is important for marketers to reinvent their products to stimulate more demand once it reaches the sales decline phase.

#### Price

The price of the product is basically the amount that a customer pays for to enjoy it. Price is a very important component of the marketing mix definition. It is also a very important component of a marketing plan as it determines the firm's profit and survival. Adjusting the price of the product has a big impact on the entire marketing strategy as well as greatly affecting the sales and demand of the product. Consequently, prices too high will make the costs outweigh the benefits in customers eyes, and they will therefore value their money over your product.

### **Place**

Placement or distribution is a very important part of the product mix definition. The marketer has to position and distribute the product in a place that is accessible to potential buyers. This comes with a deep understanding of the target market. Understand them inside out and the marketer will discover the most efficient positioning and distribution channels that directly speak with the market.

### **Promotion**

Promotion is a very important component of marketing as it can boost brand recognition and sales. Promotion is comprised of various elements like: sales organization; public relations; advertising; and sales promotion. Advertising typically covers communication methods that are paid for like television advertisements, radio commercials, print media, and internet advertisements. Public relations, on the other hand, are communications that are typically not paid for. This includes press releases, exhibitions, sponsorship deals, seminars, conferences, and events. Word of mouth is also a type of product promotion.

The 4Ps can be summarized as by the following figure 2 below.

**Figure 3: Marketing Mix 4Ps**



Source: Author's computation of marketing 4Ps created by E. Jerome McCarthy in the 1960s.

### **8.7. Empirical review**

Mbagwu and Benson (2018) assessed the challenges of meeting information needs of rural farmers through internet-based services: experiences from developing countries in Africa. The research list the following types of information that can be provided to rural farmers through internet based information service namely: (1) Market information by which rural farmers could be able to know

where to get farm machineries and where to sell agricultural products. In fact, as rightly noted by Magesa, Michael & Ko (2014), due to lack of market information, farmers are failing to negotiate better on the prices of their produces and thus are paid a little. (2) Price information: As noted by Mittal and Mehar (2012), price information has an impact by improving the bargaining capability of farmers with traders, better price realization and reduction in arbitrage, wastage or spoilage. (3) Information on credit facilities: rural farmers need information on how to access credits facilities from financial institution in order to improve and enhance agricultural productivity. (4) Pest control information: Farmers in the rural areas need information on pest control methods. Access to timely and relevant information in pest control will contribute significantly to agricultural developments in developing countries.

(5) Fertilizer sale points: In as much as fertilizer is required by farmers in rural areas in order to improve agricultural productivity, it is imperative that farmers should be provided with information relating to fertilizer sale point.

Challenges to meeting information needs of rural farmers through internet based services outlined by Mbagwu and Benson (2018) include: lack of ICT infrastructures through which internet-based service can be provided and accessed; low level of interest in utilizing agricultural information among rural farmers; inadequate knowledge of rural farmers agricultural information needs; low level of ICT literacy (Lamptey, Sambo & Hassan, 2016); non-existence of information providing agency in rural areas; and Non-existence of agricultural advisory services in libraries.

Mbagwu and Benson (2018) recommend: Improving on the strength of internet connectivity (Haruna & Baba, 2017); Creating of online farmers' discussion forum where social media platform like Whatsapp and Facebook can be used to create Online Discussion Forums (ODF) for rural farmers through which their information needs can be satisfied at a minimal costs; Organizing of ICT and agricultural information literacy for rural farmers; Carrying out research to ascertain rural farmers' agricultural information needs; Repackaging of information using social media platform; Provision of online agricultural advisory and consultancy services.

Chokera et al. (2014) assessed the role of agricultural marketing on empowering rural farmers in Masvingo Province in Zimbabwe. The data was gathered from 361 respondents being farmers specializing in the production of maize, groundnuts, small grain crops and vegetables, extension officers, bursars of boarding schools, churches and hospitals as well as supermarkets owners using in-depth interviews and focus group discussions. The research assessed the target market; quality of produce, storage, transportation, access to information, and packaging of produce. The main findings of the research are the following:

Concerning the current target markets for rural farmers in Masvingo province, the research found that urban traders, the Grain Marketing Board (GMB), local village customers, boarding schools, hospitals and some churches are the leading markets for rural farmers in Masvingo province. That urban traders are the leading buyers of produce in their districts and the farmers expressed concern on these traders as they buy at throw-away prices leaving the farmers impoverished and

that the farmers will not be able to meet the daily farm operations cost. Local village customers were mentioned as buying at competitive prices but the problem is that they buy in small quantities hence the farmers will sometimes resort to barter exchange in which they exchange a bucket of maize for either a 2kg packet of sugar, 2 bars of soaps and sometimes with clothes. Farmers also concurred that the Grain Marketing Board (GMB) buys at competitive rates but the national grain buyer delays in making payment to the farmers who will sometimes resort to selling to the urban traders who buy at cash basis but at a low price. Boarding schools, hospitals and supermarkets were mentioned as profitable markets, however, these institutions buy at a supplementary basis as they also produce some of the products like vegetables and maize hence they buy on an occasional basis. Supermarkets and foreign markets are the potential lucrative buyers capable of transforming the livelihoods of rural farmers if a proper marketing system is created for these farmers.

Concerning the quality of produce, the research found that quality is a major factor of concern especially to the rural farmers. In fact, the quality of produce from the rural farmers is low compared to the quality of produce from the large scale commercial farmers as majority of the rural farmers rely on retained seeds which do not yield large grains in the case of cereal products. Moreover, poor quality of produce can also occur as a result of little education on the part of many farmers who may not understand instructions especially on chemical application hence product quality will be poor from over - chemical application or under - chemical application. Moreover, researchers also argue that farmers in Masvingo need to improve on storage facilities if they can produce quality products as majority of the farmers are still relying on the outdated storage methods, hence the need for these farmers to form co-operatives so that they can pool resources to build modern storage facilities for the crops.

Concerning storage of produce, the research found that farmers in Masvingo province face difficulties in storing produce after harvest. Crops such as maize are stored in primitive granaries called 'Tsapi' or 'Huze' where the commodity is vulnerable to rodents also known as 'zvipfukuto' in vernacular language and this considerably affects the quality of the maize.

The absence of modern storage facilities will result in the commodity fetching low grades and the final price of the product will be very low. Absence of proper storage facilities also means that the farmer cannot store the commodity to resell in the off season at competitive prices hence farmers are forced to sell produce at disposal price as a means to avoid loss of value through perishability.

Concerning transportation, most roads in Masvingo province are not tarred and this creates challenges to farmers in the rural communities as very few transporters ply the dusty and bumpy roads. The few transporters that sacrifice to ply these routes charge prices that are beyond the reach of many farmers thus farmers are forced to sell produce to the local buyers who buy at below market price.

On access to market information, the research found that rural farmers in Zimbabwe particularly those in Masvingo have acute problems in receiving agricultural information. In Zimbabwe the usual sources of agricultural information include the Zimbabwe Broadcasting Corporation's Murimi waNahsi (Umlimi wa Namhla), which features mainly in the Zimbabwe Television around 7pm on every Thursday and sometimes through the national radio station (Radio Zimbabwe), farm magazines and publicity news. Because the rural farmers live in remote parts of the country where there is no electricity, they have limited access to the national programs on agricultural information.

Concerning packaging of agricultural products, the research states that packaging is among the factors that threaten the success of rural farmers in marketing agricultural produce. Packaging plays a crucial role especially to the rural farmer who desperately needs protection of agricultural produce. While packaging plays an important role in the marketing of the agricultural produce such as cereal crops, oil crops, small grains crops, maize, and groundnuts, among others, most farmers in Masvingo do not afford the cost of buying the 50kg bags for carrying maize, groundnuts and small grains. These farmers end up using whatever bags they come across just to cover and facilitate carriage and this affects the quality of the crops resulting in the loss on the part of the farmer as crops will be sold at a reduced price.

**The challenges faced by the farmers in Masvingo province outlined by the study are:**

Challenges related to production including late distribution of inputs from the grain marketing Board (GMB) and other farmer support groups, poor rainfall distribution, changes in climatic conditions, shortage of arable land as the chief constraints that affects productivity. The farmers stated that the challenges affect both the quantity and quality of produce thus products will not sell at competitive prices.

Challenges relating to distribution including poor road networks, where majority of the roads in the communal areas are dusty, bumpy, poor bridges and being in a state of disrepair was stated as the greatest challenge affecting transportation of produce to the desired markets.

Challenges relating to pricing include lack of market information as the chief challenge facing rural farmers leading to a situation where products are sold at throw- away prices. The reason advanced for this challenge is that farmers in rural areas especially in Masvingo suffer from lack of electricity and remain disconnected from programs that provide information support to farmers.

Challenges relating to promoting agricultural products include farmers lack knowledge about modern methods of promoting products and also that the farmers do not afford the cost of communication tools like radio, newspaper, television and transport advertising. One respondent said, " *To tell the truth farmers know nothing about the means of creating awareness for their produce.*

*Farmers only know the traditional word of mouth advertising which works well with village customers within a radius of 15 kilometres. We extension officers have to do more on educating these farmers on how best they can advertise their products to increase sales”*

Kiruthiga et al. (2015) outlined problems in agricultural marketing in developing countries. The research focused on product quality; market Information; product quantity; functionaries participation; transport; and storage. About product quality, the research found that many of the farmers are not aware of the need for quality seeds and fertilizers. The poor quality seeds and fertilizers used in land will result in poor product quality. About market information, the research found that the literacy rate of farmers in developing countries are comparably low than the developed countries.

The farmers of developing countries may not have the updated knowledge of the market trend and activities. Hence they may unable to achieve the real price of their product. Concerning product quantity, the research found that in some places improper measuring of products are still in practice. This will result in loss for the farmers at the time of buying or selling of agro produce. About functionaries participation, the research found that the functionaries in the marketing process hold a major share of profit in the form of commission: functionaries refer to agents/agencies involved in effective discharging of all activities and services called marketing functions including producers, traders, commission agents, processors, importer, exporters, facilitators and consumers. Concerning transport facility, the research found that rural areas lack transport facilities; many of the rural areas don't have proper road facility. This creates barrier in transporting the agro produce to the market place. The research found also inadequate storage facility that may lead to unwanted wastage of products (Kiruthiga et al. 2015).

Kiruthiga et al. (2015) provided remedial measures to listed challenges. Proposed remedies include: (i) Make arrangement for education and awareness program for rural farmers in order to improve their knowledge in improving agro produce and its marketing process. These programmes will help to educate the farmers in usage of quality inputs, online help for productivity improvement. (ii) Implement the rural development program in fast track to develop the infrastructural facilities such as road facility, communication facility, and electricity in rural areas. This will help for easy transportation of agro produce to the market place. (iii) Creation of direct contact network between the farmers and customers will help in reduce the so much functionaries involvement and also to reduce the unnecessary brokerage or commission to the functionaries. This may increase the profit of the farmers. This can be possible by creating local outlets in villages. (iv) To provide subsidized power supply and loans to the farmers as the expenses towards power consumption takes considerable amount of investments.

Karani and Wanjohi (2017) analyzed factors influencing marketing of agricultural produce among small-scale farmers using a case of sorhgum in Giaki location, Meru County Kenya. The study assessed the influence of middlemen in the market, road infrastructure, and access to marketing information,

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on marketing of agricultural produce among small scale farmers. The research was conducted using descriptive research design and the data was collected using questionnaires.

The target population consisted of all the 212 households which are involved in sorghum produce in Giaki location. The sample size was 138 sorghum farmers. The study found that majority of smallholder farmers (89.5%) use middlemen as market link while marketing their sorghum produce. 96.2 % of the respondents felt that middlemen are exploitive to small scale sorghum farmers. Majority of the respondents (69.1%) felt that middlemen in the market are important .The study also found out that most of the respondents (52.6 %) use dusty roads when marketing their sorghum produce. The study also revealed that 72.2 % use mobile phones as mode of accessing marketing information since it's convenience to everyone. 69.9% of the respondents get the information from the middlemen as their source (Karani & Wanjohi, 2017).

## **9. RESEARCH METHODOLOGY**

### **9.1. Research design**

This research used quantitative and qualitative research design. Mohajan (2018) defined quantitative research design as a research method that uses numerical data collected through a questionnaire; and qualitative design uses non numerical data collected through interview, group discussions, telephone calls and personnel observation. Lederman and Abel (2014) defined a mix of quantitative and qualitative approaches as an approach allow interpreting numerical data using non numerical data. This research used both methods by administrating a questionnaire to a sample population; and conducting interview, focus group discussions and personnel observation. This research used quantitative design whereby the researcher designed a questionnaire and administrated it to a sample population selected from the members of KOABIBIKA. By qualitative design, the research conducted an interview with the Sector Cooperative Officer (SCO) at Rubengera sector; and the president of KOABIBIKA. Having collected such data, the research computed statistical data collected through the questionnaire and interpreted the results supported by the results of interview.

### **9.2. Research Variables**

This research has two variables: Independent variable and dependent variable. According to Almaki (2016), a variable is any item that has a quantity or quality that varies throughout the process of investigation. Independent variable affects the dependent variable because it constitutes the cause that affect dependent variable; and the effect constitutes dependent variable. All sub causes or sub variables under independent variable constitute a series of independent sub variables.

Reference to this definition of Almaki, for the case of this study, independent variable is Agricultural marketing and dependent variable is (Economic) empowerment of farmers.

In reference to sub variables used by Chokera et al. (2014) while assessing the role of agricultural marketing on empowering rural farmers in Masvingo Province in Zimbabwe, the present research analyzed the following sub independent variables:

**1) Productivity**

By productivity, this research assessed techniques used by farmers of KOABIBIKA in improving the agricultural productivity. These techniques include the use of fertilizers, improved seeds, irrigation, using machines (mechanization), etc.

**2) Post-harvest processing techniques**

In agricultural marketing, the farmers target to satisfy the needs of the customers; and such needs are diversified. For the case of maize, customers may need flour, grains, or animal nutrition resulting from transformation of maize.

**3) Storage Techniques**

Once not well maintained and well stored, the production risk to corrupt and lead to loss. This research assessed storage techniques used by KOABIBIKA. In fact, during production season, the price is relatively low due to abundance. When the harvest is stored for a certain time and sold a bit later it generates more income.

**4) Market information**

Poor market information leads to poor knowledge on where to sell the product and where to buy technologies. This research assessed market information in KOABIBIKA in order to know whether farmers at KOABIBIKA are open to local and regional markets.

**5) Distribution channels**

Distribution facilities affect highly the price. Poor roads infrastructure challenge trucks that can transport the harvest and such situation leads farmers to loss because they sell their production to middlemen who profit from them and purchase at very low price.

**9.3. Research Population and Sample size determination**

The total population of the research comprises 782 members of KOABIBIKA including 439 men and 343 women. The research could not be conducted to all 782 members individually due to time and financial constraints. The sample was necessary to be calculated by using the following Yamane's:

$$n = \frac{N}{1 + Ne^2} \quad (\text{Yamane, 1967, p.388}).$$

Where: n=sample population; N= total population (782 members of KOABIBIKA); e= the standard margin of error at 90% confidence interval, which is equal to 10% or 0.1 and  $e^2 = 0.01$ .

By applying the formula in this research, the sample population is the following:

$$n = \frac{N}{1 + Ne^2} = \frac{782}{1 + 782 \cdot (0.1)^2} = \frac{782}{1 + 782 \cdot 0.01} = \frac{782}{1 + 7.82} = \frac{782}{8.82} = 88.66 \approx 87$$

Women are 343 and men are 439 over the total members = 782; this means that women are 44% ( $343 \cdot 100 / 782 = 44\%$ ); and men are 56%. This indicates that for 87 respondents; women are  $87 \cdot 44 / 100 = 38$ ; and men are 49.

**9.4. Sample selection techniques**

By sampling techniques, the research means techniques used to select 38 women from 343; and 49 men from 439. The techniques used by the research are the following:

**1) Probability sampling**

According to Taherdoost (2016), Probability sampling means that every item in the population has an equal chance of being included in sample. This technique was applied in the research by giving all 782 members equal chance of being selected as respondents to the research. No other conditions were applied to exclude some members.

**2) Stratified random sampling**

Taherdoost (2016) defines Stratified sampling as a technique applied where the population is divided into strata (or subgroups) and a random sample is taken from each subgroup. A subgroup is a natural set of items. Subgroups might be based on company size, gender or occupation (to name but a few). Stratified sampling is often used where there is a great deal of variation within a population. Its purpose is to ensure that every stratum is adequately represented. This research used stratified sampling by dividing 782 members of KOABIBIKA into two groups excluding each other based on sex because the research would involve both sex in the research. The strata of women was composed of 343 women and the strata of men was composed of 439 men.

**3) Simple random sampling**

Taherdoost (2016) states that the simple random sample means that every case of the population has an equal probability of inclusion in sample. By applying simple random sampling technique, this research selected randomly 49 men and 38 women to respond to the questionnaire.

**9.5. Data and Data collection techniques**

Ajayi (2017) distinguish primary from secondary data. Primary data is an original and unique data, which is directly collected by the researcher from a source such as observations, surveys, questionnaires, case studies and interviews according to his requirements. As opposed to secondary data which is easily accessible but are not pure as they have undergone through many statistical treatments. Sources of secondary data are government publications, websites, books, journal articles, internal records. For the case of this research, primary data is composed of information gathered using the questionnaire and interview; and secondary data consists of all information collected through different publications and internet search. Secondary data include statistics about members of KOABIBIKA because such data was also available at Rubengera Sector Office.

**9.6. Validity and Reliability tests**

These tests were conducted by analysing the coefficient of Cronbach’s Alpha using IBM SPSS Statistics 23. The result showed that the questionnaire was reliable at 91% as shown by the following output from SPSS analysis outlined by the table 2 below.

Table 2: Reliability Statistics

Cronbach's Alpha	N of Items
.912	45

Source: IBM SPSS Statistics 23.

## **10. DATA ANALYSIS AND INTERPRETATION OF RESULTS**

### **10.1. Identification of respondents**

This section identifies respondents by gender, age, marital status, education level, experience as member of KOABIBIKA, and by position occupied at KOABIBIKA.

**Table 3: Identification of respondents by Gender**

	Frequency	Percent
Valid Female	38	43.7
Male	49	56.3
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 2 above shows that 56.3% of respondents were male and 43.7% were female. These statistics are proportional to the shares of male and female among members of KOABIBIKA described in chapter three about research population.

**Table 4: Identification of respondents by age**

	Frequency	Percent
Valid 26- 30	3	3.4
31- 35	39	44.8
36- 40	25	28.7
Above 40	20	23.0
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 4 above shows that 44.8% of respondents were aged between 31 and 35 years; 28.7% were aged between 36 and 40 years; 23.0% were aged above 40 years; and 3.4% were aged between 26 and 30 years. The predominance of adult people in KOABIBIKA Cooperative is justified by the nature of the economic activity which is agriculture. Young generations are more oriented in off- farming activities.

**Table 5: Identification of respondents by marital status**

	Frequency	Percent
Valid Single	12	13.8
Married	48	55.2
Widow	23	26.4
Divorced	4	4.6
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 5 shows that 55.2% of respondents were married; 26.4% were widows; 13.8 were single including single mothers; and 4.6% were divorced.

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**Table 6: Identification of respondents by education level**

	Frequency	Percent
Valid Primary Education	46	52.9
Secondary Education	8	9.2
Tertiary Education	5	5.7
Informal Education	28	32.2
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 6 above shows that 52.9% of respondents had primary education; 32.2% had informal education; 9.2% had secondary education and 5.7% had university education. The advanced age of respondents outlined by the table 5 above is linked to low education level. In fact, education system in Rwanda was developed considerable after 1994 and now children are more encouraged to attend schools than before. And nowadays technical schools train youths for off- farm activities so that those who remain in farming activities are people with advanced age.

**Table 7: Identification of respondents by experience with KOABIBIKA**

	Frequency	Percent
Valid 4 Years	16	18.4
5 Years and above	71	81.6
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 7 above shows that 81.6% of respondents to this research have 5 years and above as members of KOABIBIKA; 18.6% have an experience of 4 years. This indicates that the research used experienced people and the data provided are accurate because they are the product of experience.

**Table 8: Identification of respondents by position occupied in Cooperative**

	Frequency	Percent
Valid Ordinal member	81	93.1
Member of Board	3	3.4
Member of Supervisory Committee	3	3.4
Total	87	100.0

Source: Author's computation of primary data (2019) using IBM SPSS Statistics 23.

The table 8 above shows that 93.1% of respondents were ordinal members and 3.4% were member of supervisory committee and board members respectively. This was for avoiding bias that could occur when the research could use only ordinal members; or board members; or supervisory members only.

**10.2. Evolution of productivity of maize and beans in KOABIBIKA**

This section coincide with the objective one of this research: “To examine the evolution of productivity of maize and beans in KOABIBIKA”. Under this objective, the research outlined the production of beans and maize during a period of 5 years (2014- 2018) because 2019 is not yet ended; and factors affecting production at KOABIBIKA.

**Table 9: Beans Production at KOABIBIKA (2014- 2018)**

Year	Bush Beans Yield			Climbing Bean Yield			Total	
	Tone/ha	ha	Yield	Tone/ha	ha	Yield	Yield	Hectares
2014	1.7	90	153.00	2.1	83	174.3	327.30	173
2015	1.78	90	160.20	2.29	83	190.07	350.27	173
2016	2	90	180.00	2.4	83	199.2	379.20	173
2017	1.9	90	171.00	2.46	83	204.18	375.18	173
2018	1.98	90	178.20	2.6	83	215.8	394.00	173

Source: KOABIBIKA archive (2019).

The secondary data provided by KOABIBIKA Archive outlined by the table 9 above shows that KOABIBIKA Cooperative cultivate two types of Beans including Bush beans and Climbing beans. The table shows that Climbing beans produce more yield than Bush beans. The surface for cultivating beans is 173 ha. In average, the production for Bush beans is 1.87 tonnes/ ha and the average total yield is 168.46 tonnes per year. For Climbing beans, the average production per hectare is 2.37 tonnes/ ha; and average production per year is 197 tonnes per year. The production of Bush and Climbing beans combined is estimated at an average of 365 tonnes per year.

Through participant observation, members of KOABIBIKA affirmed that these 173 ha of land used by the Cooperative were provided by the members themselves. They put together the plots of their own land and made a Cooperative land.

**Table 10: Maize Production at KOABIBIKA (2014- 2018)**

Year	Maize Yield		
	Tone/ha	Hectares	Total yield
2014	3.2	173	553.60
2015	3.8	173	657.40
2016	4.1	173	709.30
2017	4.12	173	712.76
2018	4.05	173	700.65

Source: KOABIBIKA archive (2019).

Maize alternate with beans over an area of 173 ha. The table 10 above shows that the production of maize is averaged at 3.85 tonnes/ ha; and the total production is estimated at an average of 667 tonnes per year.

**Table 11: Factors affecting productivity at KOABIBIKA?**

	N	Min.	Max.	Mean	Std. Dev.
KOABIBIKA uses fertilizers to improve productivity	87	4	4	4.00	.000
KOABIBIKA use improved seeds to improve productivity	87	4	4	4.00	.000
KOABIBIKA uses machines to improve productivity	87	1	1	1.00	.000
KOABIBIKA uses modern irrigation to improve productivity	87	3	3	3.00	.000
KOABIBIKA receive trainings for improving productivity	87	4	4	4.00	.000
The quantity of production achieved by KOABIBIKA fits with the area cultivated	87	2	3	2.18	.390
The quality of production achieved by KOABIBIKA fits the needs of customers	87	3	4	3.55	.500
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

The table 11 above assessed factors affecting productivity at KOABIBIKA Cooperative. Respondents were asked to outline factors affecting productivity at KOABIBIKA. The scale of measurement was 1 = Disagree; 2 = Tend to Disagree; 3 = Tend to agree; and 4 Agree. Main factors outlined by the research are those with average mean value exceeding 3 (tend to agree). Those include: Use of fertilizers (4.00); use of improved seeds (4.00); trainings (4.00); efforts targeting needs of the customers (3.55); and use of irrigation (3.00). The table shows that KOABIBIKA continue using man power for cultivating. It does not use machine as outlined by the table above where the variable “Use of machine” has an average mean value of 1.00 meaning disagree.

The use of fertilizers and improved seeds that results in increasing the production was affirmed by the members of KOABIBIKA through participant observation. One respondent said: “*We use two categories of seeds of beans: Improved Climbing Beans (RWV1129; RWV2269); and improved Bush Beans (RWR2245). Space in planting is 40 cm between rows (inter- rows) and 20 cm between hole. We plant 2 seeds per hole; 125000 seeds per ha. For DAP [Di-Ammonium Phosphate, a common inorganic fertilizer] we use 100kg per ha. For compost, we use 8000 kg per ha*” (One KOABIBIKA Member).

Interviewee also affirmed the role of fertilizers and improved seeds in improving the production at KOABIBIKA. One interviewee said “*KOABIBIKA produces a good quantity of beans and maize; but also they produce good quality. They are facilitated by the use of fertilizers and improved seeds. By observation, their production is interesting and the surrounding farmers are always excited about their production*” (KOABIBIKA\_2).

Another interviewee said “*KOABIBIKA is a well-organized cooperative with a big number of members. They have around 173 ha where they cultivate beans alternating with maize. They have also around 80 ha where they cultivate a variety of vegetables. We appreciate their production by*

observation. They use fertilizers to face the issue of Arabic land. They use also improved seeds for increasing their production. And we appreciate the quality of their production for beans as well as for maize” (KOABIBIKA\_1).

### 10.3. Post- harvest processing techniques used in KOABIBIKA

The second objective of this research was “to analyze post- harvest processing techniques used in KOABIBIKA”. The respondents were asked the following question “What are post- harvest processing techniques used in KOABIBIKA?” The scale of measurement was: 1 = Disagree; 2 = Tend to disagree; 3 = Tend to agree; and 4 = Agree. The results of the research are outlined by the table 12 below.

**Table 12: Post- harvest processing techniques used in KOABIBIKA**

	N	Min.	Max.	Mean	Std. Dev.
KOABIBIKA stores beans for long time for sell them during the scarcity period	87	1	1	1.00	.000
KOABIBIKA has its maize mill and transforms maize production into maize flour and domestic animals’ nutrition	87	1	1	1.00	.000
KOABIBIKA packages maize and beans in attractive bags containing KOABIBIKA brand	87	1	1	1.00	.000
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

Post- harvest processing include all techniques used to transform the harvest in other products for increasing the value of the harvest. For the case of KOABIBIKA, the table 12 above shows that there is not post- harvest treatment. All variables have average mean value of 1.00 which indicates Disagreement; and the standard deviation is .000 which means unanimity of answers.

Lack of adding value post- harvest techniques was affirmed by both interviewees. One interviewee said “I see KOABIBIKA selling production in nature without any transformation. Beans and maize are sole at their nature status” (KOABIBIKA\_1). Another interviewee said “It is unfortunate that KOABIBIKA does not yet achieved a level of adding values to their production. Maize and beans are sold in a traditional way where people come either on field or on store to buy the products. It is the same for vegetables they cultivate” (KOABIBIKA\_2).

### 10.4. Storage mechanisms for maize and beans in KOABIBIKA

The third objective of the research was “to assess storage mechanisms for maize and beans in KOABIBIKA”. Respondents were asked the following question: “What are storage mechanisms for maize and beans in KOABIBIKA?” the scale of measurement was 1 = Disagree; 2 = Tend to disagree; 3 = Tend to agree; and 4 = Agree. The results of the research are outlined by the following table 13.

**Table 13: Storage mechanisms for KOABIBIKA products**

	N	Min.	Max.	Mean	Std. Dev.
The production of KOABIBIKA is stored using public stores	87	4	4	4.00	.000
KOABIBIKA stores the production in houses of members	87	1	1	1.00	.000
KOABIBIKA its own stores	87	1	1	1.00	.000
The stores used by KOABIBIKA fit standards	87	4	4	4.00	.000
KOABIBIKA sell the production directly from the field	87	3	4	3.34	.478
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

The table 13 above shows that KOABIBIKA Cooperative has no proper storages for its harvests. The table shows that the production of KOABIBIKA is stored using public stores (4.00). Because these stores are public, they fit the standards (4.00). The table shows also that a portion of the harvest is sold on field before storing (3.34). This happens frequently for maize which is immediately cooked from the field.

Through interviews, respondents affirmed that KOABIBIKA does not have its own stores and this affects the Cooperative. One interviewee said “*KOABIBIKA store its production using public stores. These facilitate the Cooperative; but on the other side this technique is challenging because public stores may have maintenance problems due to limited budget on the side of the Government*” (KOABIBIKA\_1).

**10.5. Sources of market information for KOABIBIKA**

The fourth objective of the research was to find out the sources of market information accessed by KOABIBIKA. In fact doing trade business goes with getting updated information about market and know where there is scarcity of the product you have in order to trade there your products.

The respondents were asked the question “What are sources of market information accessed by KOABIBIKA?” the scale of measurement was 1 = Disagree; 2 = Tend to disagree; 3 = tend to agree; and 4 = Agree. The results of the research are presented in the following table 14.

**Table 14: Sources of market information for KOABIBIKA products**

	N	Min.	Max.	Mean	Std. Dev.
Media (radio, TV, Newspapers)	87	1	1	1.00	.000
Telephone	87	4	4	4.00	.000
Internet	87	1	1	1.00	.000
Meetings	87	4	4	4.00	.000
KOABIBIKA has internal marketing officer	87	4	4	4.00	.000
KOABIBIKA hire officers to market their products	87	1	1	1.00	.000
KOABIBIKA simply deals with local markets	87	4	4	4.00	.000
KOABIBIKA deal with local Middlemen	87	4	4	4.00	.000
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

The table 14 above shows that sources of information about markets at KOABIBIKA is poor. According to the table, the information is provided through the phone (4.00); meeting (4.00); internal marketing office (4.00); dealing with local markets (4.00); and deal with local Middlemen (4.00). The table shows that KOABIBIKA has poor marketing strategies: It does not advertise in media (1.00) and it does not use internet such as websites, twitter, watsapp, etc. Such poor marketing strategies are linked to low level of education outline by the table 6 above. This lead to sell the production on local market at of course a low price as outlined by the following table 15.

**Table 15: Current Markets of KOABIBIKA products**

	N	Min.	Max.	Mean	Std. Dev.
Local Boarding Schools	87	4	4	4.00	.000
Local village customers (individual persons)	87	4	4	4.00	.000
Local market (Rubengera market)	87	4	4	4.00	.000
Middlemen	87	4	4	4.00	.000
Urban traders (from Kigali, Muhanga, Huye cities)	87	4	4	4.00	.000
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

Limited source of market information outlined by the table 14 above results in selling the product locally to schools (4.00); Local village customers (individual persons) (4.00); Local market (Rubengera market) (4.00); Middlemen Urban traders (from Kigali, Muhanga, Huye cities) (4.00). The middlemen and traders from big cities (Kigali, Huye, Muhanga) benefit better than the Cooperative because they sell their harvest at high cost whereas the Cooperative is still dealing with local market of neighbors with limited purchasing power.

The use of local markets by KOABIBIKA was affirmed by interviewees: One said “*I never saw any advertisement on TV or Radio and on Internet or any other social media about the products of KOABIBIKA. I think that they search markets using mobile phone because I saw many of them having a mobile phone. Once the production is ready, some commissioners go through tradesmen to interest them coming buying*” (KOABIBIKA\_2).

#### **10.6. Distribution channels used by KOABIBIKA**

The fifth objective of this research was to outline distribution channels used by KOABIBIKA. In fact, the distribution channels affect the price and the income on the side of the Cooperative. Respondents were asked the question “What are distribution channels used by KOABIBIKA?” The scale of measurement was 1 = Disagree; 2 = Tend to disagree; 3 = Tend to agree; and 4 = Agree. The results are presented in the following table 16.

**Table 16: Distribution channels for KOABIBIKA products**

	N	Min.	Max.	Mean	Std. Dev.
Body transportation using manpower	87	1	1	1.00	.000
Transport using bicycles	87	1	1	1.00	.000
Transport using motor vehicles	87	4	4	4.00	.000
KOABIBIKA uses tarred roads to distribute production	87	4	4	4.00	.000
KOABIBIKA uses bumpy roads to distribute production	87	4	4	4.00	.000
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

The table 16 above shows that KOABIBIKA use motor vehicles to transport the harvest to the markets using tarred and bumpy roads (4.00). Manpower and bicycles are not used as a means of transport for KOABIBIKA products (1.00). This is justified by the findings of the table 15 about consumers of KOABIBIKA Products including boarding schools and the local markets where the harvest is transported in bug quantity. Local consumers who come to buy beans or maize on field use their means of transport depending to the quantity purchased.

**10.7. Challenges to agricultural marketing faced by KOABIBIKA**

The sixth objective of this research was “determine challenges to agricultural marketing faced by KOABIBIKA”. Respondents were asked to answer the question “What are challenges to agricultural marketing faced by KOABIBIKA?” the scale of measurement was 1 = Disagree; 2 = Tend to disagree; 3 = Tend to agree; and 4 = Agree. The results of the research are outlined by the following table 17.

**Table 17: Challenges to agricultural marketing faced by KOABIBIKA**

	N	Min.	Max.	Mean	Std. Dev.
Climate change causing poor rainfall distribution	87	3	4	3.83	.380
Shortage of arable land favorable for productivity	87	1	4	3.86	.436
High price of fertilizers and seeds	87	2	4	3.90	.342
Poor road networks affecting distribution channels and lower the price	87	3	4	3.69	.465
Poor access to market information affecting price	87	3	3	3.00	.000
KOABIBIKA does not afford the cost of advertising through radio and TV	87	4	4	4.00	.000
Rural conditions discourage using maize mill for transformation of maize production and packages	87	4	4	4.00	.000
Poor storage facilities causing loss of production and selling it at low price	87	4	4	4.00	.000
Valid N (listwise)	87				

Source: Author’s computation of primary data (2019) using IBM SPSS Statistics 23.

The table 17 above outlines a series of challenges faced by KOABIBIKA. The main challenges are those with an average mean exceeding 3 (tend to agree). Those are: Rural conditions discourage using

maize mill for transformation of maize production and packages (4.00); Poor storage facilities causing loss of production and selling it at low price (4.00); KOABIBIKA does not afford the cost of advertising through radio and TV (4.00); High price of fertilizers and seeds (3.90); Shortage of arable land favorable for productivity (3.86); Climate change causing poor rainfall distribution (3.83); Poor road networks affecting distribution channels and lower the price (3.69); Poor access to market information affecting price (3.00).

Challenges outlined by the table 17 are supported by the results of interview. One interviewee said *"As challenges I list: low education which leads to doing things in a repeated ways; lack of own stores; lack of post-harvest added values techniques; lack of maize mill for transforming maize into flour; selling only on local market at low price; obligation to sell quickly the production for avoiding corruption of the production (maize, beans, vegetables); cultivating manually also take too long time: they could use mechanization because they have capacity to buy machines"* (KOABIBIKA\_2).

## **11. SUMMARY OF FINDINGS**

Respondents to the research included 56.3% male and 43.7% were female in proportion to gender shares among members of KOABIBIKA (table 3). 44.8% of respondents were aged between 31 and 35 years; 28.7% were aged between 36 and 40 years; 23.0% were aged above 40 years; and 3.4% were aged between 26 and 30 years (table 4). 55.2% of respondents were married; 26.4% were widows; 13.8 were single including single mothers; and 4.6% were divorced (table 5). 52.9% of respondents had primary education; 32.2% had informal education; 9.2% had secondary education and 5.7% had university education (table 6). 81.6% of respondents to this research have 5 years and above as members of KOABIBIKA; 18.6% have an experience of 4 years (table 7). And 93.1% of respondents were ordinal members and 3.4% were member of supervisory committee and board members respectively (table 8).

On the first objective of the research which was to examine the evolution of productivity of maize and beans in KOABIBIKA, the research found that KOABIBIKA Cooperative cultivate two types of Beans including Bush beans and Climbing beans. The table shows that Climbing beans produce more yield than Bush beans. The surface for cultivating beans is 173 ha. In average, the production for Bush beans is 1.87 tonnes/ ha and the average total yield is 168.46 tonnes per year. For Climbing beans, the average production per hectare is 2.37 tonnes/ ha; and average production per year is 197 tonnes per year. The production of Bush and Climbing beans combined is estimated at an average of 365 tonne per year. These findings are supported by the table 9 of this research.

Maize alternate with beans over an area of 173 ha. The research found that the production of maize is averaged at 3.85 tonnes/ ha; and the total production is estimated at an average of 667 tonnes per year. This finding is supported by the table 10 of this research. The main factors affecting productivity outlined by the research include: Use of fertilizers (4.00); use of improved seeds (4.00); trainings (4.00); efforts targeting needs of the customers (3.55); and use of irrigation (3.00). These findings are supported by the table 11 of this research.

The second objective of this research was “to analyze post- harvest processing techniques used in KOABIBIKA”. The research found that there is not post- harvest treatment. All variables have average mean value of 1.00 which indicates Disagreement; and the standard deviation is .000 which means unanimity of answers. This finding is supported by the table 12 of this research.

The third objective of the research was “to assess storage mechanisms for maize and beans in KOABIBIKA”. The research found that KOABIBIKA Cooperative has no own proper storages for its harvests. The production of KOABIBIKA is stored using public stores (4.00). Because these stores are public, they fit the standards (4.00). A portion of the harvest is sold on field before storing (3.34). This happens frequently for maize which is immediately cooked from the field. These findings are supported by the table 13 of this research.

The fourth objective of the research was “to find out the sources of market information accessed by KOABIBIKA”. The research found that sources of information about markets at KOABIBIKA is poor. The information is provided through the phone (4.00); meeting (4.00); internal marketing office (4.00); dealing with local markets (4.00); and deal with local Middlemen (4.00). KOABIBIKA has poor marketing strategies: It does not advertise in media (1.00) and it does not use internet such as websites, twitter, whatsapp, etc (1.00). These findings are supported by the table 14 of this research.

Limited source of market information outlined by the previous section (the table 14) results in selling the product locally to schools (4.00); Local village customers (individual persons) (4.00); Local market (Rubengera market) (4.00); Middlemen Urban traders (from Kigali, Muhanga, Huye cities) (4.00).

The middlemen and traders from big cities (Kigali, Huye, Muhanga) benefit better than the Cooperative because they sell their harvest at high cost whereas the Cooperative is still dealing with local market of neighbors with limited purchasing power. These findings are supported by the table 15 of this research.

The fifth objective of this research was to outline distribution channels used by KOABIBIKA. The research found that KOABIBIKA uses motor vehicles to transport the harvest to the markets using tarred and bumpy roads (4.00). Manpower and bicycles are not used as a means of transport for KOABIBIKA products (1.00). These findings are supported by the table 16 of this research.

The sixth objective of this research was “determine challenges to agricultural marketing faced by KOABIBIKA”. The research found that the main challenges include: Rural conditions discourage using maize mill for transformation of maize production and packages (4.00); Poor storage facilities causing loss of production and selling it at low price (4.00); KOABIBIKA does not afford the cost of advertising through radio and TV (4.00); High price of fertilizers and seeds (3.90); Shortage of arable land favorable for productivity (3.86); Climate change causing poor rainfall distribution (3.83); Poor

road networks affecting distribution channels and lower the price (3.69); Poor access to market information affecting price (3.00). These findings are supported by the table 17 of this research.

## **12. CONCLUSION**

This research was about “Farmers Empowerment through Agricultural Marketing. A case of KOABIBIKA Cooperative (2015- 2019)”. Specific objectives of the research were: Specific objectives of the research were: to examine the evolution of productivity of maize and beans in KOABIBIKA; to analyze post- harvest processing techniques used; to assess storage mechanisms for maize and beans; to find out the sources of market information accessed; to outline distribution channels; and to determine challenges to agricultural marketing faced by KOABIBIKA. The research used a mix of quantitative and qualitative research design where numerical data was collected through a questionnaire designed in form of four levels Likert scale; and non- numerical data was collected using open questions in the questionnaire; structured interview; and participant observation. Quantitative data was analyzed using IBM SPSS Statistics 23 and the results were interpreted using qualitative data. The total population of the study was 782 members of KOABIBIKA including 439 men and 343 women. A sample of 87 key informants was determined using Yamane’ formula; and respondents were selected using simple random sampling technique. Reliability test was conducted through piloting survey conducted on 10 members of Cooperative planting Coffee in Bwishyura Sector; and the Cronbach’s Alpha coefficient found was .912 or 91% meaning excellent reliability.

### **Main findings of the research are the following:**

Respondents to the research included 56.3% male and 43.7% were female in proportion to gender shares among members of KOABIBIKA. 44.8% of respondents were aged between 31 and 35 years; 28.7% were aged between 36 and 40 years; 23.0% were aged above 40 years; and 3.4% were aged between 26 and 30 years. 55.2% of respondents were married; 26.4% were widows; 13.8 were single including single mothers; and 4.6% were divorced. 52.9% of respondents had primary education; 32.2% had informal education; 9.2% had secondary education and 5.7% had university education. 81.6% of respondents to this research have 5 years and above as members of KOABIBIKA; 18.6% have an experience of 4 years. And 93.1% of respondents were ordinal members and 3.4% were member of supervisory committee and board members respectively.

On the first objective of the research which was to examine the evolution of productivity of maize and beans in KOABIBIKA, the research found that KOABIBIKA Cooperative cultivate two types of Beans including Bush beans and Climbing beans. The research found that Climbing beans produce more yield than Bush beans. The surface for cultivating beans (both types) is 173 ha. In average, the production for Bush beans is 1.87 tonnes/ ha and the average total yield is 168.46 tonnes per year. For Climbing beans, the average production per hectare is 2.37 tonnes/ ha; and average production per year is 197 tonnes per year. The production of Bush and Climbing beans combined is estimated at an average of 365 tone per year. Maize alternate with beans over an area of 173 ha.

The research found that the production of maize is averaged at 3.85 tonnes/ ha; and the total production is estimated at an average of 667 tonnes per year. The main factors affecting productivity outlined by the research include:

Use of fertilizers (4.00); use of improved seeds (4.00); trainings (4.00); efforts targeting needs of the customers (3.55); and use of irrigation (3.00). These findings are supported by the table 11 of this research.

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Limited source of market information outlined by the previous section (the table 14) results in selling the product locally to schools (4.00); Local village customers (individual persons) (4.00); Local market (Rubengera market) (4.00); Middlemen Urban traders (from Kigali, Muhanga, Huye cities) (4.00). The middlemen and traders from big cities (Kigali, Huye, Muhanga) benefit better than the Cooperative because they sell their harvest at high cost whereas the Cooperative is still dealing with local market of neighbors with limited purchasing power.

The fifth objective of this research was to outline distribution channels used by KOABIBIKA. The research found that KOABIBIKA uses motor vehicles to transport the harvest to the markets using tarred and bumpy roads (4.00). Manpower and bicycles are not used as a means of transport for KOABIBIKA products (1.00).

The sixth objective of this research was “determine challenges to agricultural marketing faced by KOABIBIKA”. The research found that the main challenges include: Rural conditions discourage using maize mill for transformation of maize production and packages (4.00); Poor storage facilities causing loss of production and selling it at low price (4.00); KOABIBIKA does not afford the cost of advertising through radio and TV (4.00); High price of fertilizers and seeds (3.90); Shortage of arable land favorable for productivity (3.86); Climate change causing poor rainfall distribution (3.83); Poor road networks affecting distribution channels and lower the price (3.69); Poor access to market information affecting price (3.00).

### **13. Recommendations**

#### **To KOABIBIKA**

For facing challenges and improving production and also diversifying the products, KOABIBIKA is recommended to adopt mechanized agriculture which is the process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity. In fact, in modern times, powered machinery has replaced many farm jobs formerly carried out by manual labour. In this sense, KOABIBIKA should work with financial institutions and take a loan to import machines that can increase the production. Members will be engaged in other economic activities generating more income for the Cooperative. KOABIBIKA should use maize mill for transforming maize into flour which is sold at high price. By this tool, not only KOABIBIKA will sell maize but also its flour; and have diversified products of maize. Such flour will be sold at boarding schools and different markets. KOABIBIKA should also improve where it sources marketing information and initiate the use of internet and social media. Some regions of Rwanda and in the region (EAC) may have a crisis of famine whereas at KOABIBIKA there is crisis of lack of customers. Lastly, KOABIBIKA should improve its marketing strategies and advertise its products to big markets through radio, TV, and personnel visiting.

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