ASSESSMENT OF AGRICULTURAL PRODUCTION IN PRISONS TO MEET INMATES DEMANDS IN ZANZIBAR

IBRAHIM RAMADHAN KHAMIS

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CERTIFICATION

The undersigned certified that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled; "**Assessment of Agricultural Production in Prisons to Meet Inmates Demand in Zanzibar"** in partial fulfillment of the requirements for the degree of Master of Arts in Monitoring and Evaluation.

……

Dr. Emmanuel Patroba Mhache

Supervisor

……..….

Date

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DECLARATION

I, Ibrahim Ramadhan Khamis, do declare that, this dissertation is my own original work and that it has not and will not be presented similar degree or to any other University awards.

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Signature

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Date

DEDICATION

I dedicate this dissertation to my wives Amina Haji Pongwa and Faudhia Saad Suleiman for their encouragement and support during the research and writing of this dissertation.

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ABSTRACT

The study assessed the agricultural production to meet inmate demands in Zanzibar. Specific objectives were to examine types of crops growing in prisons to meet inmate's demands, to evaluate techniques used in agricultural productions in prisons centers, to examine agricultural production in prisons in Zanzibar and to determine challenges facing agricultural production in prisons camps. The study was conducted in prisons in Unguja, Zanzibar. The quantitative and qualitative data were collected. The sample size was 200 inmates. The study indicated that from the financial years 2010/2011 the contribution of the food from prison camps were rendered only 15% but in the recent budget the level increased 25% this meant that, from 12 months of the year about 3 months the prison camp has capacity on providing their food from the prison camps. The study showed that 141 (70.5%) of the correspondents agreed that the Technological deprived in agriculture was the most leading causes on Prison farms also the other causes like Small number of inmates ready for farming activities of 34 (17%), low production varieties of 19 (9.5%) and the low market price of 6 (3%). The results presented in figures, tables and frequencies. The study identified challenges facing agriculture such as pure planning of prison on agriculture especially during dry season, lack of awareness on the use of crop residue and manures and there was no research conducted in prison on agriculture. The government needed to make revision on prison annual budget so that it could help to increase agricultural outputs also more emphasis should be undertaken on the use of modern techniques for working easily and increasing productivity, also commercializing of the inmates farming activity was very crucial in collaboration with the private sectors.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABREVIATIONS

EAC	East African Community
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GNP	Gross National Product
JKU	Jeshi la Kujenga Uchumi
MKUZA	Mkakati wa Kukuza Uchumi Zanzibar
MOFEA	Ministry of Finance and Economic Affairs
OCGS	Office of Chief Government Statistics
PHQ	Prison Head Quarter
PORALGSD	President House, Regional Administration, Local Government and
PTSD	Depression and Posttraumatic Stress Disorder Special Departments
SSA	Sub Sahara Africa
TNA	Training Need Assessment
TP	Training Plan
ZAPR	Zanzibar Agriculture Performance Report
ZAWA	Zanzibar Water Authority

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture recognized in improvement of the economic in developing countries. An estimated US$14 billion worth of agricultural products were exported to the world market in 2000 (Othman, 2011). The contribution of agriculture to the Gross National Products (GNP) of African countries remained very high. Similarly, agriculture contributes 30-50% of GDP in most countries (Thangabalu, 2016). As referred to earlier, the sector employed 60% of the labor force (El Tahlawy, 2011).

The low per capita production contributed to the increase the number of chronically undernourished people on the continent. In 1999, 194 million of the 200 million chronically undernourished on the Africa continent were in sub-Saharan Africa, representing 34% of the entered population of the sub-region (NEPAD, 2002). Globally, it projected that available cultivatable land per capita in developing world has decreased from 0.3 in 1988 to 0.11 ha by 2025. Although urban farming became significant in some countries in Africa, a proportionately large amount of urban and rural demand for food have to be met largely from rural deliver from a fixed and even diminishing land base, thus, an overall intensification of agriculture almost inevitable (Boserup, 1981; Pingali *et al*., 1987; Smith *et al*., 1997).

The most sustainable means of increasing land production was the intensification of agriculture through greater integration of crops and livestock production or mixed crop-livestock farming (McIntire *et al*. 1992; Winrock, 1992). Growth of agriculture has the greatest attention in developing countries, due to its potential to reduce

poverty levels. The significant paradigm shift towards structural transformation in agricultural sectors due to the argument that agriculture was an “engine of growth” in countries that was in the early stages of development, because agriculture accounts for high proportion of the economic activities was less in developed countries (Byerlee *et al*. 2005). The growth in agriculture has implications for the welfare of the society livelihoods, since the sector dominated by small and medium scale family farmers (Valenzuela *et al.,* 2005).

The role of agricultural sector in economic development and welfare improvement in East African Community (EAC) stated and other developing countries did not over emphasized. According to COMTRADE data base, agricultural trade accounted for over 40 per cent of the total EAC intra-regional trade. Additionally, given that 75% of world women live in rural areas dominated by agricultural sector, improving agricultural trade contributed to women economic empowerment in the region. In Tanzania, small holder irrigation systems were either traditional enhanced or modern schemes managed by the community.

The institutional arrangement for irrigation water resource management and utilization was such that the community organize themselves into groups of irrigators/water users association (WUA) in accordance with the rights and eligibility of member irrigation farming participation. The irrigation farming involvement rights was defined by their institution in collective action (CA) and government common resources management guidelines and policy. In order to access irrigation water such groups (irrigators) granted ownership in form of common water right permit (NIPO, 2009).

Agriculture was the most vital sector of the economy of Zanzibar. The contribution of agriculture increased to 39% (81,812 Million T.shs) of the overall GDP of 208,085 Million T.shs in 2001. During the same period, agriculture's contribution to foreign exchange earnings increased from 75% in 1997 to 79% of foreign exchange earnings in 2001 (MOFEA, 2002). The relative increased in agricultural sector contribution during the past three years was due to an increase in both crop production (especially food crop production) and livestock production. For example, production of paddy, cassava and bananas increased by 57%, 14% and 91% respectively between 1999 and 2001.

On the other hand, production of milk, beef and chicken has increased by 6%, 7% and 8% respectively between 1999 and 2001. Increase of crops and livestock has amplified domestic food production and consequently decline in food imports. An expense on food imports has declined from 39,158 Million T.shs. in 1999 to 25,308 Million T.shs. in 2001 (MFEA, 2002). Although expenditure on food imports has declined, food imports still form more than 40% of total imports. In 1999, food imports formed 44% of total imports, declining slightly to 42% of the total imports in 2001(MOFEA, 2002). This reflected the need to improve and intensify crop and livestock production in Zanzibar in order to increase domestic production.

Livestock Invention Systems (LPS) in Europe were characterized for the six main sectors, such Dairy Cattle for Milk Production (BOMILK), Meat Production from Bovine Livestock (BOMEAT), Meat Production from poultry (POUFAT), Egg Production (LAHENS), meat and Milk Production from Sheep and Goats (SHGOAT) and Pig Production. Description of the LPS in Europe was done at the

regional level using 8 groups of descriptors (animal assemblage, climate, intensity level, productivity level, cropping system, manure production, feeding strategy and environmental impact).

The increased in livestock production following eradication of tsetse and trypanosomosis, assessment of the aggregate production and demand for livestock products indicate that demand falls short of supply of livestock products such as milk. Comparison of current (2002) production as well as projections with current and future demand indicates that the domestic consumption needs were significantly higher than domestic supply. This suggested that Zanzibar continued to experience a deficit of milk and continued to rely on imports unless concerted efforts are made to increase domestic production.

However, continued reliance on food imports cannot be sustained and could impact negatively to livestock and agricultural production. Therefore, deliberated efforts must be made by Zanzibar authorities with private sector and other stakeholders to tackle constraints were affecting the livestock and agricultural sector. These restraints included poor livestock and crop extension services, processed and marketing of crop and livestock production, diseases and low practice of inputs and improved crop and livestock varieties (MOFEA, 2002).

Indicators of intensification in livestock production include adoption of high yielding animal breeds accompanied by improved nutritional and health management practices. Intensification in crop production requires the adoption of high yielding crop varieties, use of inorganic and organic fertilizers and other inputs that can raise

output per unit area. How well farmers adopt these practices clearly depends on the availability of opportunities and their willingness to take advantage of such opportunities.

The abolition of trypanosomosis in 1997 has provided a more favorable environment for raising improved livestock species and has opened up new opportunities for a more optimal use of land resources through integration of crop and animal agriculture as well as the availability of improved animal breeds and crop varieties. The 1999 socio-economic survey has provided evidence for increasing intensification of livestock and crop production following tsetse eradication in Unguja, Zanzibar (Tambi *et al.* 1999).

1.2 Statement of the Problem

Several studies revealed that gardening was an effective therapy for managing mental illness such as depression and posttraumatic stress disorder (PTSD) for inmate (Annerstedt, 2011). The benefits of garden included providing healthy foodstuff, increasing physical activity and helped to develop skills and work ethics (Elings, 2006). Sandel (2004) described the benefits of horticulture therapy for inmates. In the prison system, there was higher proportion of people with mental illness than in the general population (Sandel, 2004).

A horticulture program at a detention center came at very little cost and has proven effective in studies to improve self-esteem and decrease the effects of mental illness (Sandel, 2004). Sandel's study found that gardening helped improve social skills, raised self-esteem, reduced anxiety, and taught patience and delayed gratification to

inmates (Sandel, 2004). Sandel proposed that gardening therapy could be used as a way to reduce aggressive occasion by providing stress reducing benefits to inmates and staff (Sandel, 2004).

Agriculture was considerable economic sector of the Zanzibar in terms of food production, employment generation, production of raw materials for industries and generation of foreign exchange. The agricultural sector contributed 30.8% to the GDP (Economic Survey, 2009). The agricultural related infrastructure constrained by inadequate and poor state of crops, fisheries, and livestock related infrastructure, namely: small to medium scale irrigation schemes, rural feeder roads, agricultural rural market centers and storage facilities, fish landing sites, slaughter houses and abattoirs (Dlegado *et al.* 1999).

The constraints contributed to the low production and productivity performance of the sector. Despite these constraints, Zanzibar has significant potential for market-led commercialization of the agriculture sub-sector, driven by domestic urban demand and the increasing tourist investments. The Government and its organization similar to JKU, Prisons and Ministry of Agriculture, have large areas of land. The Prison Department, the custodian of trainee's activities as well as the production categories, the Department has been constrained by agriculture and livestock production system through which lead to small output that direct to very low agricultural outputs. The low agricultural production and output in prison did not meet inmate demand in Zanzibar prison, thus was the problem the study preferred to provide answer.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study was to assess agricultural production in prisons to meet inmate's demands in Zanzibar.

1.3.2 Specific Objectives

i. To examine types of crops grown in prisons to meet inmates demands.
ii. To evaluate techniques used in agricultural productions in prisons centers
iii. To examine agricultural production in prisons in Zanzibar.
iv. To determine challenges facing agricultural production in prisons camps.

1.4 Research Questions

i. i. What kinds of crops grown in prison to meet inmates' demands?
ii. ii. What were the challenges facing agricultural production in prisons?
iii. iii. Why agricultural production to meet inmates demands.
iv. iv. What were the measures to address challenges facing agricultural production in prisons?
v.

1.5 Significance of the Study

Zanzibar Prison Department invested a lot in land for agricultural production. The purpose was to increase the level of products and advance the quality and wide variety of products hence increase food availability in the prison centers. The study increased the knowledge on how inmates used to accelerate food production in prison. In recent year the production techniques in prison department becomes a very limited. The findings provided several contributions to agricultural and livestock

production for prison department in Zanzibar. The study assisted to generate new knowledge, where the prison administrators improved agricultural production in prisons and meet the demands of inmates. The findings further raised the level of awareness on agriculture and inmates' demands also provide overall support to enhance other study in prison setting. The findings of the study served Prison Department in improving policies and decision making.

1.6 Organization of the Study

The study organized into five chapters. The first chapter presented introduction and background, statement of the problem, research objectives, and research questions, significance, and organization of the study. Chapter two presented literature review, involved introduction, definition of key terms, theoretical and empirical literature review. Other issues covered in chapter two were conceptual framework, research gap and chapter summary. Chapter three covered introduction of the chapter, research methodologies, the study area, research design, target population, sampling procedures and sample size, data sources, data collection methods, data analysis. Chapter four has interpretation and presentation, validity and reliability, result and discussion. Chapter five included conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter appraised various literatures related to agricultural activities and in prisons. The literature review covered definition of key-terms, theoretical, empirical literature review, conceptual framework, research gap and chapter summary.

2.2 Definitions of Concept

2.2.1 Prison Department

The Offender's Education Institutes (prison department) has been justified as the centers for providing correctional services to trainees (inmates) in order to change their behaviors by providing correctional services through vocational training that would be good citizens when they left the prison (The Law of Offender's Education Institute 2007). In this study the term Prison Department, has been used for the wider understanding while it refereed as Offenders Education Institute.

2.2.2 Agriculture

Agriculture was the knowledge of cultivated the soil, harvesting crops, and raising livestock (Black, 1990). The science of the production of plants and animals was useful to man. According to Agpalo (1997), agriculture comprised the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of agricultural or horticultural commodities, the raised of livestock or poultry, and any practices performed by farmer on a farm as an incident to in conjunction with some farming operations but did not include the manufacturing and processing activities of the product.

2.2.3 Inmate

Inmate meant a person living in an institution such as a prison or hospital (Thomas *et al.,* 2003). In other words, inmate or prisoner meant a person who deprived of liberty against his or her willing (Butterfield, 2001). This could be confinement, capacity or by forcible restraint. The term applied particularly to those on trial or serving a prison sentences in a prison. According to the Law of Offender's Education Institute, the term inmates was the same to offenders.

2.2.4 Inmate Demands

The term inmate demands referred to those requirements for inmates such as foods, health environment and other human needs for their whole life in prison (Fields, 2005). Prisoners was grew their own vegetables and food crops to complement what government provides. What is therefore needed was the provision of tools and equipment as well as land to breathe new life into the agricultural component (Awolugutu, 2015).

2.2 Theoretical

The theoretical literature review explained the aspects associated with agricultural activities in prison camps. In order to gained deeper understanding and developed strong appreciation for the concepts and terms mentioned it necessary and appropriate to explained them. In discussed agricultural activities in prison, the research involved theories related to the prison agricultural models. The theory based on food consumption however the concept of inmates came from both prison environment and mental hospital lives. Farmed and its branches included the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and

harvesting of any agricultural or horticultural commodities, the raised of livestock or poultry, and any practices performed by farmer on a farm as an incident to or in conjunction with some farming operations but did not include the manufacturing and processed activities of the product in prison areas (Agpalo, 1997).

2.2.1 Farming Therapy

The reviewed proscribed and observational studies and determined that nature has a positive effect on human health (Annerstedt & Wahrborg, 2011). The results showed health improvements in areas ranging from schizophrenia to obesity in 26 out of 29 meta-analyses (Annerstedt and Wahrborg, 2011). The study concluded that gardening therapy was a relevant source of therapy for public health and may served as an important public health intervention i (Annerstedt and Wahrborg, 2011) The theory based on health but the concept of inmates comes from both prison environment and mental hospital lives.

2.2.2 Social Cognitive Theory

The Bureau of Justice Statistics reported that among those in state and federal prison in 1997, approximately 40 percent had not completed school, compared with 18% of the general population over age 18 (Harlow 2003). Among males age 20 to 39, those in prison had markedly lower academic achievement than their counterparts in the general population. Compared with the general population, those in prison were approximately double as likely not to have completed school. And four times the number of young males in the general population had attended some college or post-secondary courses compared with incarcerated males. Although nearly all state,

federal, and private prisons offer some type of educational and vocational programming, resources have not kept pace with the increasing prison population.

Accordingly, only half of the total inmate population received educational or vocational training, a proportion that has been decreasing over time (Harlow 2003; Lynch and Sabol 2001). Courses typically offered through education programs include GED, high school, college, and English as a second language classes. The rates of contribution in various programs by state and federal prisoners. (Often rates of participation in programs were limited by the number of available program slots.) Notably, only about one-third of prisoners receive vocational training designed to improve their ability to obtain legitimate employment once released.

The theory of length of stayed in prison today's inmates were spent a longer period behind bars than their counterparts as recently as 10 years ago. Among inmates released from prison in 1999, the average time served in prison for the current offense was 29 months, compared with 22 months served by those released from prison in 1990 (Hughes *et al.,* 2001). Further, the proportion of soon-to-be-released inmates who reported serving more than five years nearly doubled, increasing from 13 percent in 1991 to 21% in 1997 (Lynch and Sabol 2001). Several researches has shown that after being incarcerated for long periods of time, former prisoners indeed have lost many of their networks or contacts that could help them find a job (Hagan and Dinovitzer 1999).

Time in prison may also have strengthened ties to antisocial peer groups, and as a consequence, restricted awareness of or access to legitimate work opportunities.

Inmates who participate in treatment programs for substance abuse are less likely to reoffend upon their release, as compared with inmates who do not participate (Gaes *et al.,* 1999). Despite these results, and the sizable number of offenders with substance abuse issues, only a small and declining portion of inmates receive alcohol and drug treatment during incarceration In 1997, ten percent of state prisoners and nine percent of federal prisoners reported participating in formal treatment (e.g., residential programs, professional counseling, or detoxification) since their admission to prison, compared with 25% and 16%, respectively, in 1991 (Mumola, 1999). Thus, it was clear that any effort to improve the employment outcomes of former prisoners need to address the medical, mental health and substance abused issues that can interfere with the ability to obtain and maintain a job.

2.3 Empirical Literature Review

2.3.1 Emergence, Development and Evolution of Agriculture

Agriculture and livestock as enterprises emerged and developed separately under a given set of conditions. When some or all of the conditions change in a given direction, agricultural and livestock enterprises could develop linkages. Okike (2002) related the developments that lead to linkages with the factors of land and labor. Okike (2002) uses the example of crop farmers and pastoralists. The lowest level of interactions of factors characterized by relative abundance of land and extensive farming, crop and livestock started off as independent enterprises with very little interactions.

Later, pressure on land leads to increased frequency of cultivation of the same plot and a decrease in arable land per capita. Crop farmers faced with problems of

declining soil fertility and increasing demand for labor for crop production while pastoralists become constrained by the unavailability of feed in adequate quantity and quality for livestock production. When participating pastoralists and crop farmers are contended with these exchanges and make no further effort to deal with their farming constraints, only crop-livestock interactions are said to be occurring. However, farmers become induced to own both crop-livestock in order to exploit the synergies and complementarities of crop-livestock interactions leading to crop-livestock integration. Special features for agriculture-livestock interaction depicted in the resource flows and management influences (STA, 1998). In these systems the livestock component did not have a permanent presence in the set up.

2.3.2 Crops Growing in Prison in Zanzibar

In Zanzibar prison, the department cultivated rice, sugarcane, cassava, sweet potatoes, vegetables, maize and others includes spices for food serving and commercial. The department of Zanzibar prison plant such crops so as to cover the needs of inmates and in prison since the budget regulated by the government not completely satisfy the feeding needs of inmates. The Agricultural sector policy of Food Security and Nutrition policy that collectively aspired at promotion of sustainable livelihoods and enhancement of food security at household and national levels.

The sections gave highlights on the current and potential levels of production; proposed technological packages to reach the potential yield levels and the cost benefit analysis for production of these priority crops. The intention was to provide

evidence of agribusiness potentials in Zanzibar that should rapid private sector investments needed to bring the envisaged commercial transformation of the sector and in prison area, also should be indicated as food production center as the goals of rehabilitation.

Correctional Department in Zanzibar have a wide range of crops grown in various correctional centers, they produced foods like rice, cassava, sweat potatoes, yams and maize, also there was a very production of various vegetable and fruits like Tomato, banana, green paper, onions, pawpaw, watermelon, cucumbers and pumpkins. The total contribution of those productions that facilitate the nutritious food package for inmates was only 20% from the total food budget status (Zanzibar Correctional Report 2016/2017).

2.3.3 Fishery and Aquaculture in Zanzibar

Zanzibar islands enclosed with the Indian Ocean with waters richly endowed with marine resources made up of a wide variety of species and other sea products, such as snappers, groupers, sharks, pelagic shrimp lobsters, and deep water fish, and tuna. Also Zanzibar prison fishing practiced in Bumbwini prison center approximately of 4.2tons of fishes produced annual. All these form solid basis for primary and fish processing industry for local and export market. However these marine resources in both territorial and Exclusive Economic Zone (EEZ) were underutilized. Zanzibar Agricultural Transformation was set to support and facilitate investments increased fish production and aqua culture, as well as in handling and processing activities such as; smoking, sun-drying, freezing and packaging.

The demand for fish was increased high for the local consumption (include tourism sector) and in prison center where inmates consumed for food. The most common fish species highly demanded included lobsters, crabs, finfish, tuna salad, sardines and salmon, which find their main export markets in Europe (Gichuru et al, 2003). The high demanded of fish to satisfied local demand and potential export markets justified investment in fish industry; a priority intervention area promulgated in Zanzibar Agricultural Transformation initiatives. The thrust further directed towards providing investment and policy guided to local small–medium fisheries enterprise and creating conducive environment for investment through provision of specific support services such as research and development, information on stocks and markets, credit and other form of financial support.

The Deep Sea provided substantial investment opportunity in fisheries development towards promoting capacity in production, processing and marketing through investing in semi-industrial vessels capable of fishing for deep water pelagic in contiguous Exclusive Economic Zone (EEZ) waters; established suitably equipped fish collection/icing centers in more remote areas, investing in onshore fish processing establishment compliant with international requirements (Zanzibar Report 2016/2017). This related with the Prison Fish farm Project developed in terms of processing techniques such as packaging for longer use where the availability of fish products were sometime seasonal available, Zanzibar prison developed the fish farm at Bumbwini camps in which fish production increased by 1.1tons per year. Generally, the nutritious food was needed by Inmates to ensure their rights at imprisonment (Tanzania Human Rights Report 2016).

2.3.4 Challenges Facing Agricultural Production in Prison, Zanzibar

The common challenges in prison facing agricultural activities, include weak value addition in agricultural produce, inmates needs food from various testing, authorized and regulatory framework on agricultural system, institutional set-up dealt with agricultural activities, underdeveloped and improperly managed agricultural marketing infrastructure, inadequate marketing research and intelligence which restrain timely availability of data and information essential for decision making, the admission to financial services for agricultural marketing activities, and inadequate marketing linkage, also inadequate physical infrastructure to support the sector, poor farming techniques, limited access to quality farm inputs, too much relying on rain, lack of data marketing, inadequate production and post-harvest technologies hasten the agricultural production in correctional department.

2.3.5 Measures to Address Challenges Facing Agricultural Production

Manure ingredient with animal excrement, mixed with straw or leaves (Gichuru et al, 2003). The amount and quantity of the excrement depended on the animals' feed. Good manure contains more than just excrement and urine. Straw and leaves were added and it was aged. Ageing was necessary to retain all the nutrients. Used aged manure was an ideal method to retain and increased the available nutrients, improved the structure and water retention capacity of the soil (Gichuru et al, 2003). Nutrients directly added by the application of chemical fertilizer to the soil (Gichuru et al, 2003).

However, the addition of chemical fertilizer alone was not enough to retain a sufficient level of soil fertility. Traditionally, fallow periods used to restore the soil

fertility after a period of crop cultivation, and to repress the growth of weeds that commonly grow between crops (Ndobe, 2013). There were variety of agricultural techniques from a lower to greater farm productivity, these practices included tillage, no tillage, ridges, manual, animal tractions, terracing, crop associations, farm associations (FAO, 1999a).

2.4 Policy review

In Tanzania, agriculture was the foundation of the economy (National Development Vision (NDV) 2025 and National Strategy for Growth and Reduction of Poverty NSGRP, 2005). The agriculture sector comprised of crops, livestock, forestry and hunting sub-sectors. Smallholder farming dominated agricultural production and its large proportion was for subsistence. It contributed significantly in terms of aggregate growth, exports, employment and linkages with other sectors. It was a homestead to approximately 80% of the population that was mainly engaged in farming activities for their livelihoods.

In 2006, it contributed about 75% of total employment and 26.2% of the Gross Domestic Product (GDP) based on Revised National Accounts Estimates for Tanzania Mainland, using year, 2001 as a base. One of the supports for achieving the medium term targets of poverty reduction under NSGRP was growth in agriculture of at least 5% by 2003. Achieved in 2001 and 2002, when agriculture grew by 4.9%. The growth in the agricultural sector reached 4.3% in year 2005 and declined to 3.8% in 2006 and its contribution to the overall GDP was 26.2% and 25.8% in 2005 and 2006, respectively. Therefore, agriculture was still the main source of livelihood for the majority of the population and its performance determines the overall

improvement in people's living standards and development of the economy (NSGRP, 2005).

The government strategy objective on crops was to increase food self-sufficiency and exploited opportunities for exports for crops that Zanzibar has comparative advantages. The strategic approached for achieving the gradually commercialized the production of rice, cassava, banana, sweet potatoes, vegetables, selected tropical fruits and spices. The sections gave highlights on the current and potential levels of production; proposed technological packages to reach the potential yield levels and the cost benefit analysis for production of these priority crops in prison. The intention was to provide evidence of agribusiness potentials in Zanzibar that should prompt private sector investments needed to bring about the envisaged commercial transformation of the sector and bring enough food storage for inmates.

2.5 Conceptual Framework

Conceptual framework was a model of how one variable makes a logical sense of the relationship among factors that have been identified as important to the problem Sekaran, (2003) cited in by Adam and Kamuzora (2008). The conceptual framework of assessed the modes of agricultural activities in Prison, described independent variables as reasons contributing to how agriculture meets the inmate demand, dependent variable as challenges while intermediate variables as measures to address those challenges. Figure 2.1 was a conceptual framework which shown the correlations of reasons that contributes to food production in prison. The independent variables were small proportion of food to inmates, tradition method of cultivation. The dependent variables were the challenges which are direct or indirect

influenced by above independent reasons such as low production, shortage of equipments. And intermediate variables were the measures to address those challenges.

Prison Agricultural Transformation initiatives took an extensive assessment of these farms that included analysis of their performance and potentials for specific commercial enterprises and subsequently instigate for optimization and adequate utilization of these land resources through promoting joint-venture schemes between the Prison agencies and prospective ministerial firms. The modalities for commitment of business firms required the public sector support in two areas improvement of investment climate and removed bottlenecks for medium and large scale development along the agricultural worth chains in prison situation.

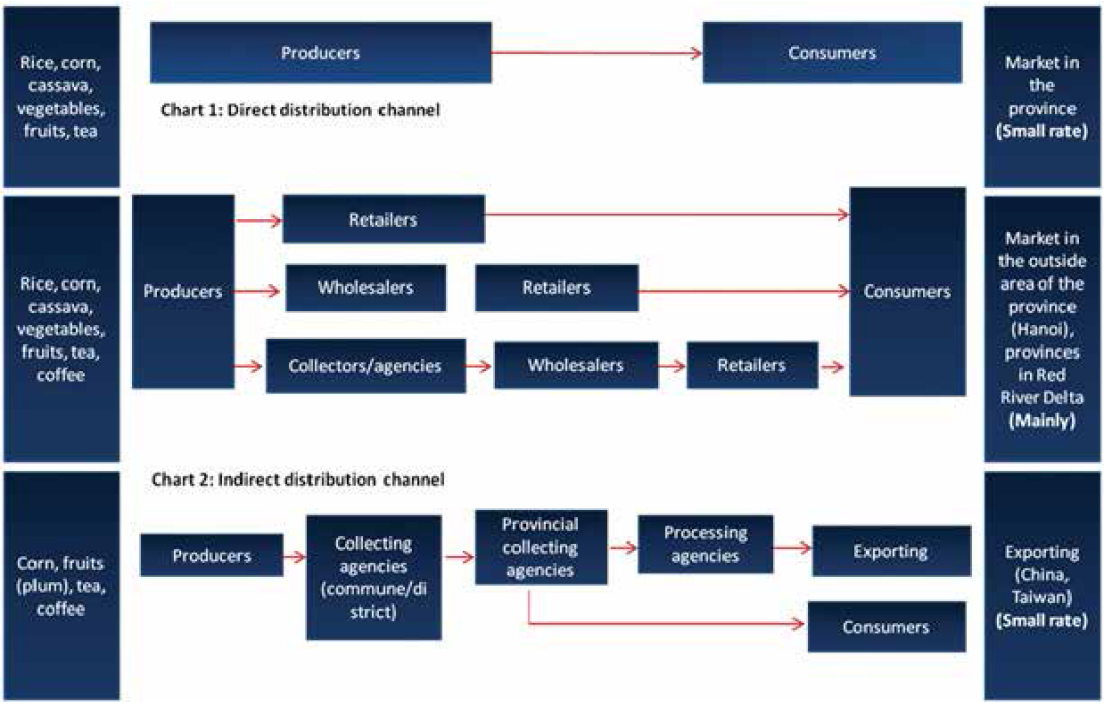

Figure 2.1: Schematic Representation of the Component of Agricultural System and Their Interaction

Source: Wolani, 2015

2.6 Research Gap

The Government of Tanzania carried out the National Sample Census of Agriculture in prison camps, agriculture was observed to contribute about 11.3% (Agricultural census, 2008). The study done in prison such as by Ricky *et al.*, 2013, explained on vocational programs in the Federal Bureau of Prisons. Slavoljub, 2014 emphasized on the role and potential of information technology in agricultural improvement. Amy (2004) the employment dimensions of prisoner re-entry.

The study did not explain exactly the agriculture in prison fit the inmate's demands. The agricultural related infrastructure in prison constrained by inadequate and poor state of crop, fisheries, and livestock related infrastructure, namely: rural feeder roads, agricultural rural market centers and storage facilities, fish landing sites, slaughter houses and abattoirs (Dlegado *et al.*, 1999). Despite these constraints, Zanzibar has significant potential for supporting agriculture sector through initiation of modern technical for high rate production and employed enough expertise. Still the agricultural production in Zanzibar prison was less, did not meet inmates demands.

2.7 Chapter Summary

The literature review explained on theory of prison education; a half of the total inmate population received educational and vocational training, a proportion that has been decreasing over time. The theory explained inmates spent a period of time behind bars than their counterparts a decade that indo to increase production. In empirical literature review various studies were conducted to examine the agricultural production, emergence, development and evolution of agriculture, crops

growing in prison, fishery and aquaculture, and challenges facing agricultural production in prison based international, regionally and local prison setting. The conceptual frame work expressed a model of the component of agricultural system and their interaction in relation to prison and prison management referred as the Rehabilitation for Inmates.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter presented the study area and the research designed. This chapter also presented target population, sampling procedures and sample size, sampling frame and sample size, sources of data, data collection methods and data analysis, interpretation and presentation. Validity and reliability, ethical consideration and chapter summary were presented.

3.2 Study Area

The study performed in eight prisons; Kiinua Miguu, Langoni, Ubago, Kinumoshi and Hanyegwa Mchana from Unguja and Wete, Kangagani, Tungamaa and Kengeja from Pemba. These prison centers have a 200 of inmates involved in agricultural activities. The selected areas were in Zanzibar because no study has been done in particular situation.

3.3 Research Design

The research design was the arrangement of conditions for collection and analysis of data in a manner that it combined relevant information to the research for the purpose of minimizing the information. Research design was a framework for specifying the relationship among the study variables and plan for selecting sources and type of information used in answering research questions. In order to comprehend to the objectives of study, the researcher applied descriptive research design to understand the perceptions and actions of the respondents on the mode of food production in relation to the number of inmate in prison setting. Qualitative and

quantitative approaches were used. Meant that, both qualitative and quantitative information used in data collection.

3.4 Target Population

The targeted population was inmates and prison staff. Specifically, administrative personnel and technical groups in the Prison center targeted to provide in-depth information. Eight prison centres; Langoni, Kinumoshi, Hanyegwa Mchana, Bumbwini, Tungamaa, Kengeja, Wete and Kangagani.

3.5 Sampling Procedures

The sampling procedures were purposive sampling and random sampling techniques. The researcher adopted this approach for getting more and detail information from key respondents to make validation and authentic of such information. Based on the objectives and scope of the study to be accomplished this study together and manipulate both qualitative and quantitative data collected from different sources using different techniques.

3.5.1 Purposive Sampling

Purposive sampling involved deliberate selection of particular units of the universe constituting a sample represented the universe Kothari (2004). The purposive sampling technique was employed to select prison officers and officers in charge in all prison centers.

3.5.2 Simple Random Sampling

Simple random sampling technique was a probability sampling technique where all

members in the population have the same chance of being selected to form a sample (Adam and Kamuzora, 2008). The technique was applicable for selecting inmates and staff from eight prison centers out of 240 targeted populations in which 200 inmates and 40 were staffs. The random sampling done to select four prison centers out of eight. The prison centers grouped into three clusters, each group had almost 50 members, and the participating selected randomly as follows; 50 cards given number 1 to 50 represented serial numbers of inmates in each group. Then the draw done for all groups and the cards selected for each draw/group represented the serial number of the particular group. Finally, 20 members from the group selected to represent eight prison centers for total of 160 respondents.

3.6 Sample Size

The sample size of inmates determined by using the formula developed by Israel (1992) where level of precision of 5% used. The actual sample size obtained as followed:-

$$n = \frac{N}{1+N(e)^2}$$ Israel (1992)

Where; n – Number of Sample size,

N – Number of members

1 – Constant number,

e – The level of precision.

Thus,

$$n = \frac{240}{1+240(0.028)^2} = 200$$

The 200 was the sample size used in the study as calculated from the formula

3.7 Source of Data

Primary data collected from the field. Questionnaires, interview and observations used to collect primary data. Secondary data achieved from the review of various literatures related to agriculture and livestock at local, regional and international context. Published and unpublished materials reviewed.

3.8 Data Collection

3.8.1 Questionnaires

Questionnaires were used to gather information from staff and inmates. The questions began with a series of closed-ended questionnaires with boxes to tick and pursued with section of open-ended questionnaires.

3.8.2 Interview

The structured interview used by standardized questions for each research question, informal and unstructured conversation (Saunders *et al.* 2009). Interviews technique allowed the researcher to interact with the inmate for understand their response and it was useful when the researcher desired more in depth information about a person's attributes, knowledge and attitudes (Senter *et al.* 2010). Both formal and informal interviews used in gathering information relevant to the study. The researcher used this technique because was verbal way of discussion and gave the opportunity to the researcher to observe real situation and understand the attitude and emotional of the prison staff and inmate through their response to the questions.

3.8.3 Direct Observation

The study focused on the use of direct observation where researcher visited to the production areas; also he can identify the technological adherence and leakages or setback from which various literatures addresses. This technique performed by the observation guidelines from which it did affect with any interruption at the field. Direct observation meant viewing, according to Loraine *et al.* (2006). Observation method involved watching, recoding and analyzing events of interest. The researcher observed events from the inmates. The information derived through observation and being recorded whenever it proved to be of relevance.

3.8.4 Documentary Literature Review

The study reviewed a number of literatures related to agriculture in general and in prisons. There were numbered of documents relates to agricultural in prison such as; Prison Yearly Production Report (PYPR), Zanzibar Agriculture Performance Report (ZAPR) and the National Strategy Implementation Report. Agricultural production books and journals which are published and unpublished reviewed. The updated documents from the local, national and international outlook used during conceptualization and document reviews.

3.9 Data Analysis, Interpretation and Presentation

The most frequently used calculations for analyzing quantitative data from program evaluations were averages, weighted averages, percentages and frequency distributions Senter *et al*, (2010). Collected data from the field processed by using SPSS and Ms Excel to describe major variables, results from question were putten in

Software SPSS to derive the variable. Quantitative data analyzed using descriptive statistics. Qualitative data from interviews analyzed by content analysis (data analyzed in texts regarding authenticity, or meaning from respondents‟ responses on "Who says what, to whom, why, to what extent and with what effect).

Data interpretation was when the researcher exposed relations and processes that underlie his findings (Kothari, 2004). Data interpretation was an attempt to establish continuity in research through linking the results of a given study with those of another. The researcher explained the findings on the basis of the theory of change. Generalization done and concepts be formulated by grouping results into two groups; the qualitative data in one group and quantitative data in another group.

3.10 Validity and Reliability

3.10.1 Validity

Validity was highly linked to the credibility of a research Silverman (1997), the study applied triangulation technique where interviews, questionnaire and observation used. This done through piloting of the data collection instruments used to collect data. The data collected from participants and key informants. The statistical analysis used to analyze data most appropriate one hence the results from analysis supported the answers for research questions and specific research objectives.

3.10.2 Reliability

Reliability was the consistency of measurement the results obtained by a survey instrument (Senter *et al,* 2010). According to Easter by *et al.* (2002) reliability of

data assessed by posing three questions; measured yield the same result on the other occasions? Did similar observations be reached by other observations? And was there transparency in how raw data have been used to draw conclusions? Hence the reliability on this study observed in the following ways; the researcher selected the sample randomly with the help of the parents of the specific area. Then the researcher used a checklist of questions when making interview with inmate so as to achieve data consistency and completeness. The data analyzed and interpreted basing on theoretical framework.

3.11 Ethical

Inmate's records were very confidential and information within the prisons kept by a special organ. After the approval of the proposal, the researcher seeks the permission of collecting data from the Prison Department' Statistics Center which was available at the Prison Head Quarter (PHQ). According to Zanzibar Prison Department structure, the Prison Department' Statistics Center office was under Head of Administrative Department (HAD). The researcher submitted the request to HAD to access the inmates and prison staff data. The required information included information from admission office, pre and post counseling information, number of inmates accommodated in prisons and any other related information used for this study. Several techniques will be used to protect the right of participants in this study.

3.12 Chapter Summary

The research methodology covered the research design, the study area and the study population, the sampling procedures and sample size, source of data, the methods of

data collection, the method of ensuring validity and reliability and data analysis. The study conducted in Zanzibar prison centers and descriptive research design used. Qualitative and quantitative data collected from inmate. Data collection methods involved interviews and questionnaire. The methods to ensure validity and reliability of data observed.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter focused on results obtained from questionnaires, interviews and observation during the data collection in prison departments.

4.2 Socio-Demographic

4.2.1 Age

The data showed that 14.5% have 20 to 30 years while 30% were aged 30-40 years (Table 4.1). However, 34% had 41-50 and 21.5% aged between 50 and above years old.

Table 4.1: Ages

Age	Responses	Percentages
20-30	29	14.5
31-40	60	30.0
41-50	68	34.0
50+	43	21.5
Total	**200**	**100.0**

Source: Field Survey, 2017

4.2.2 Education

Educational level divided into four categories. 25.5% have primary education level (Table 4.2); while secondary education level was 31.5%. Inmate with higher education level was 28.5% and 14.5% has vocational training education.

Table 4.2: Education of Inmates

Level of education	Responses	Percentages
Primary education	51	25.5
Secondary education	63	31.5
Advanced secondary education	57	28.5
Vocational training	29	14.5
Total	**200**	**100.0**

Source: Field Survey, 2017

4.2.3 Gender

Fifty one percent were males and 49% were females. Numbers of male inmates were high than female because this result implied that majority because male was high interest of agriculture compared with their females respondents and also the nature of criminal offences for males were higher than female.

Table 4.3: Gender

Gender	Frequencies	Percentages
Male	102	51.0
Female	98	49.0
Total	**200**	**100.0**

Source: Field survey, 2017

4.2.4 Marital Status

Data showed that 47.5% were married while 35.0% were single and 17.5% were widower/widowed. The result implied that majority married.

Table 4.4: Marital Status

Marital Status	Frequencies	Percentages
Single	70	35.0
Married	95	47.5
Widow	35	17.5
Total	**200**	**100.0**

Source: Field survey, 2017

4.3 Crops grown in Prisons

Prison was a place where people who have breach the laws are kept for correction. While in prisons people engaged in farming, livestock keeping, lumbering and the like. Food crops grown by inmates were for their daily meals. Crops grown by prisoner include maize, cassava, rice and beans (Table 4.5). Forty percent mentioned production of rice, 43.6% of cassava, and 15.5% of maize. This implied that, cassava and rice were more produced in prisons in Zanzibar compared to maize and other crops.

Table 4.5: Main Crops Produced By Inmates

Main crops grown by inmates	Frequencies	Percentages
Rice	81	40.1
Cassava	88	43.6
Maize	31	15.5
Total	**200**	**100**

Source: Field Survey, 2017

Study depicted 47% of inmates interviewed proves that agriculture practiced by prisoners has managed to meet food demands of inmates while 53% of the inmates showed that, the productions has not meets the demand of food for inmates (Table 4.6). This meant that there was a shortage of food from prison agriculture on feeding inmates in prison camps.

Table 4.6: Does Agriculture Meets Demand Of Food for Inmates

Does needs for food met?	Frequencies	Percentages
Yes	92	47
No	108	53
Total	**200**	**100**

Source: Field Survey, 2017

4.4 Crops Harvesting and Consumption in Prison Farming

The study showed consumption was higher than the amount crops harvested (Kgs) for 17 years. The data from the correspondent showed that the prison farming has minimal capacity for what produced and the level of food consumed.

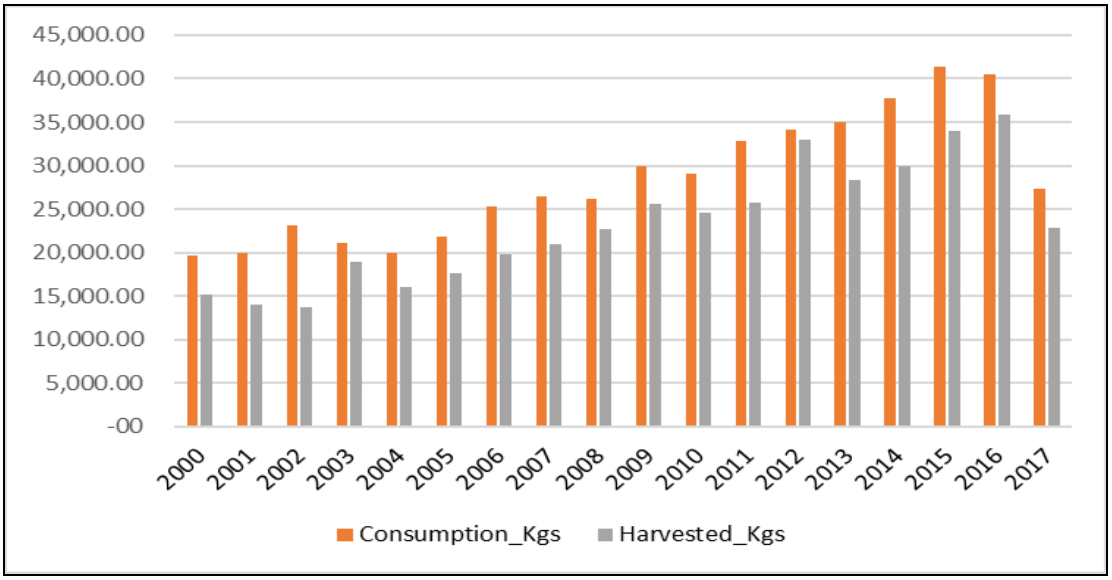

Figure 4.1: Harvesting and Consumption of Crops (Kgs)

Source: Field survey, 2017

Shown on the above figure, high level of harvesting and consumption was experienced between 2011 and 2016 before it started getting diminishing in 2017 where as low production and consumption at increasing rate occurred in the previous years (2000 and 2010). Additionally, although both harvesting and consumption showed upwards trend yet in the recent years mainly in 2017 both decreased significantly because cost of labor and fertilizers increased up to TZS 10,400,690 compared to the previous financial year (2016) which was 9.9 Million and also the use of fertilizers and chemical dropped. To assess whether the differences depicted

on the above figure was statistically significant or otherwise the researcher employed t-statics as the results presented.

Table 4.7 Statistically Comparison Between and Crops Harvested and Inmates' Consumption (Demand)

	Consumption (Kgs)	Harvested (Kgs)
Mean	27815.73684	22825.21053
Variance	54615843.2	48733081.06
Observation	19	19
Pooled	51674462.13	
Df	36	
t Stat	2.139785155	
P(T<=t) two-tail	0.039222238	
t Critical two-tail	2.028094001	

Source: Field Survey, 2017

As shown on the above table, the consumption of inmates' crops was 27815.73684 Kgs where as production level was 22825.21053 Kgs. The difference was significant at 5% (calculated t-value: 2.02 and P-value; 0.039). The results provided evidence that the inmates demand has not been met due to low production from the prison's farms. Through open ended question the researcher was able to capture respondents' opinion about the level of agricultural production. Here below was a quote from one of the respondents;

> *" We don't have too much argument about producing varieties of farming products due to low budget but we ask Government to assist prison department on strengthening agriculture we can eat fresh food and vegetable because we have a capacity but we haven't enough budget for production"* Respondent Opinion, Kiinua Miguu Camp (2018).

Financial resource was very important toward farming of the inmates, otherwise, they cannot produce sufficient and varieties of crops for inmates' consumption. As

of 2018 the departments have small capacity to make production that reflects the amount demanded by the inmates.

4.4.2 Techniques and Practice Used in Agricultural Productions in Prisons Centers

The researcher sought to make an assessment of the techniques used in farming in the context of soil management. The respondents were required to rate the list of farming techniques which included the use of manures, mineral fertilizers, waste and composites. The counts and percent are given in the Table 4.8.

Table 4.8: Farming Techniques in Prison Department

Farming techniques	Frequencies	Percentage
Farm Manure	53	26.2
Mineral Fertilizer	55	27.2
Waste	65	33.0
Composite	16	8.0
Others	11	5.4
Total	**200**	**100**

Source: Field Survey, 2017

The table 4.8, the results showed that 53 (26.2%) use Farm manure that use harvesting residue for soil fertility and plot setting, 55 respondents (27.2%) provided Mineral Fertilizers, 65 respondents (33.0%) uses wastes, 16 respondents (8.0%) kept composite and 11 respondents with (5.4%) use other techniques on soil improvement while production. This showed that traditionally the prison department tends to inject on natural land fertile techniques rather Industrial Chemicals fertilizers as table below clarify.

Additionally, technological advancement and other needs for correctional services to offenders seems to be very productive hence became a major technique in

correctional for those short-sentenced inmates and become behavior changed when they left prison (Kathryn 2006). The following table showed farming methods practiced by the inmates

4.4.3 Farming Methods and Their Frequency & Percent Scores

The figure 4.2 showed the farming methods done by the inmates in Zanzibar. Overall, Zero tillage being the lead, slash/spray and crop rotation was the mostly used farming methods while slush/burn, hoeing and shifting cultivation were the least farming methods as per opinions. More specifically, the results showed that 57 (82.2%) used zero tillage which meant the prison camp keeps farming once in every year, other method was slash and spray with 44 frequency (21.8%) correspondent that use simple geared machines for spray and slashing like Kinumoshi and Langoni Farming plots, there was also slush and burn with 31 respondents (15.3%) and this method was famous in legumes farming at stoned lands such as Ubago and Hanyegwa Mchana Camps.

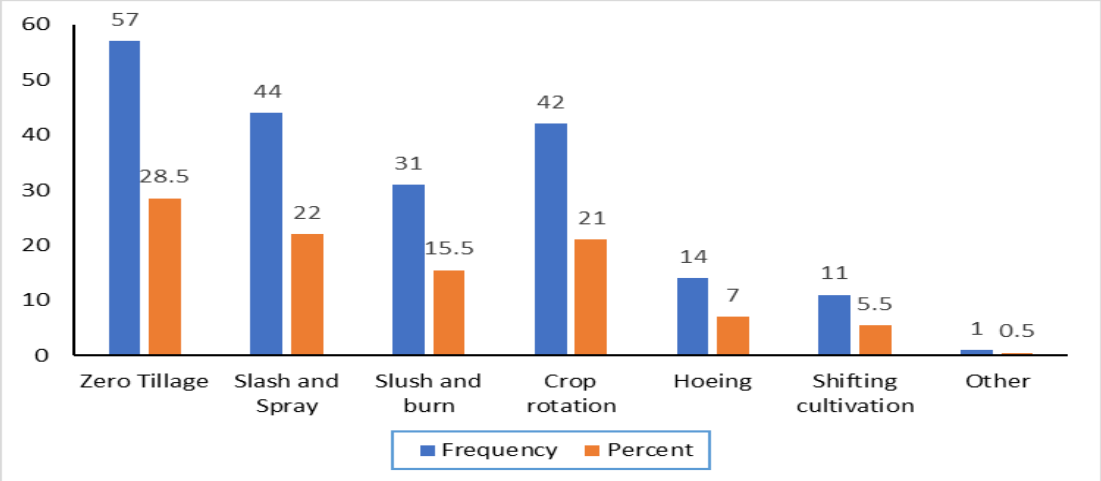

Figure 4.2: Farming Methods and Their Frequency & Percent Scores

Source: Field survey, 2017

Hoeing was 14 (6.9%) of inmates that used when they interred to farming in primary correctional stage, hoes was mostly used in stoned and rough land. There was also Shifting cultivation with 11(5.4%) of inmates proved the uses of shifting cultivation which was very old farming method that was depleted. Other farming methods is 1 (5%) that applied in farming in prison farms.

4.4.4 Factors for Low Inmates' Agricultural Production in Prison Centers

The data intended to assess causes poor agricultural production for the inmates in Zanzibar. Some of the possible factors reviewed included level of technology, labors (inmates), production varieties and market. Low level of technology was ranked the first factor that contributes to the low agricultural production and market was the least.

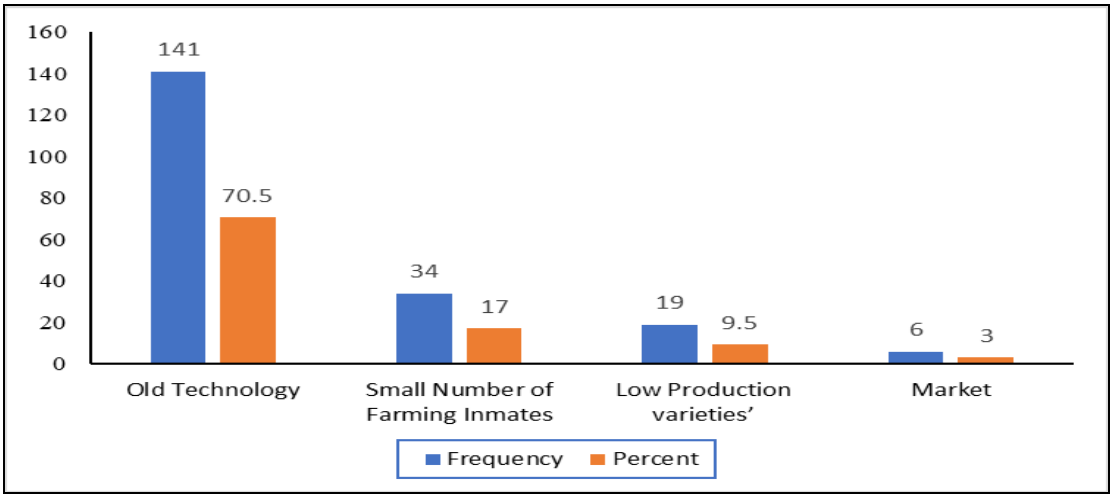

Figure 4.3: Causes for Low Agricultural Production in Prison Centers
Source: Field survey, 2017

The data showed that 141 (70.5%) agreed that the technological deprived in agriculture was the most leading causes on Prison farms and the lowest factor was market; 6 (3%). Other factors included small number of inmates ready for farming activities of 34 (17%), low production varieties of 19 (9.5%) and the low market

price of 6 (3%). Similarly, the researcher examined opinions of the inmates on whether there was a need of making an improvement on the inmates farming both for their correctional services and for the technical advancement.

Table 4.9: The Needs to Continue Practice Agriculture in Prison At Zanzibar

	Frequencies	**Percentages**
Yes	166	83.0
No	34	17.0
Total	**200**	**100**

Source: Field Survey, 2017

Results showed 166 (83%) of correspondents agreed development strategies should be invested in agriculture in prison while 34 (17%) has no willing that prison department should continue invaded in agriculture. The investment on agriculture in prison setting was the most important techniques on correctional and rehabilitation procedures whereby prisoner has chance for healthier meals, refreshed minded, corrective and after cared life prepared (Omale 2011).

Data from the Table 4.10 showed the correlation analysis to assess relationship between Production, application of fertilizers and chemicals. The objective was to discover whether the change of inmates' production was also associated with farm size, application of fertilizers and the use of chemicals. The results have revealed positive relationship between the variables as shown on the table in Table 4.10.

Table 4.10: Correlation analysis for fertilizers and chemical used in Prison farms

	Harvest (Kgs)
Farm size	0.899473269
Applied Fertilizers used (Kgs)	0.23436497
Used Chemicals_Liters	0.670082128

Source: Field survey, 2017

As depicted on the above table, the results showed farm size (0.89) and the use of chemicals (0.67) were strong correlated with the inmates' farms production followed by application of fertilized (0.23). This shown graphically on the below figure;

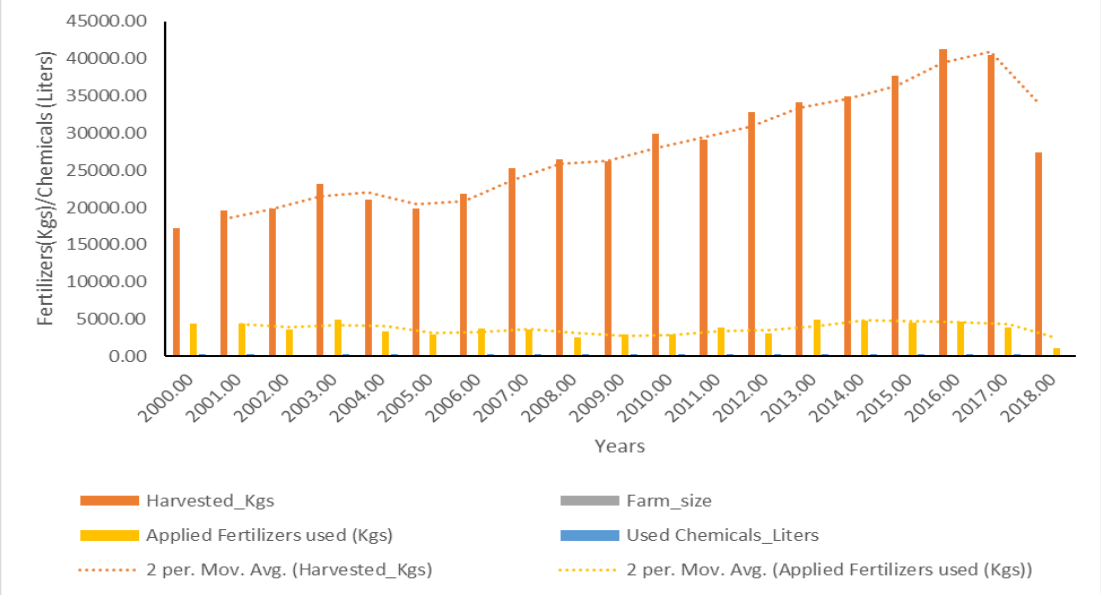

Figure 4.4: Trend of Production, Farm Size, Application of Fertilizers And The Use Of Chemicals
Source: Field survey, 2017

The above figure showed production of food crops varies over time with the change in farm size, application of fertilizers and chemicals. Recently, between 2017 and 2018 all the variables indicate to decline as well. Among other factors like improvement of the budget, inputs factors mainly fertilizers and chemicals remained significant to the improvement of agricultural in prison setting.

4.4 Challenges Facing Agricultural Production in Prisons

The study shown the activities of the inmates in the penitentiary farms, different from what the inmates have been used to in the closed-system at Kinumoshi Penitentiary, were the reasons of low production regard the program as self-transformational. At Ubago penitentiary the vast majority had little to no experience

in agricultural matters. For most inmates, whether working in the Field or in the garden the rural environment was a radical variation in their way of living and working. It followed fairly basic agricultural practices and has minimal requirement of financial investments in the agricultural activities and inputs. The production level of the farm was relevant, but an emerging theme was the continuous activities of the inmates were by far important.

4.5.1 Poor Planning and Organization during Dry Season Production

The study found that 90 of inmate (44.6%) agreed with the use of dry season farming process on keeping the land fertile and also 110 (55.4%) responds that the department was not well engaged on farming during dry season. The result evidently showed that the prison department has no enough capacity in modern techniques such as drip irrigation, green house farming and other modern types of farming. Therefore the land stayed bared but other lands given to the community for short contract and the rest land planted seasonally.

Table 4.11: Opinion on Whether Department are Well Organized During Dry Season Production

Dry Season Production	Frequencies	Percentages
Yes	90	44.6
No	110	55.4
Total	**200**	**100**

Source: Field Survey, 2017

4.5.2 Lack of Awareness on the Use of Crop Residue

Burning crop residue was a common challenge in many local farming but in prison department the farming was a part of correctional services to inmates, whereas burning residue were not allowed hence used to improve soil fertility. The study

showed 78 (39.6%) were not aware that burned residue makes land to lose its fertility while 122 (60.4%) did not know about it. This implied majority of the inmates were not aware of the contribution of decayed crops would have improved soil fertility. For example, there was a crop residue at Kinumoshi and Langoni from the rice harvesting; they took the residue and keeps in Banana trees for long water resistance while these residuals used on the prison farms for improving its soil fertility.

Table 4.12: Awareness on Use of Crop Residue

Burning of crop residue awareness	Frequencies	Percentage
Yes, aware	78	39.6
No, not aware	122	60.4
Total	**200**	**100**

Source: Field Survey, 2017

4.5.3 Shortage of Inmates for Agricultural Production

The data showed that the inmates were not correlated with the land occupied in the prison camps their number was very low compared with those prison placed in Tanzania Mainland (Mboje 2013) Kinumoshi camp was one among those leading productive camps in Zanzibar prison department, the number of inmates was about 81 where by the land covered in the camp was 500 acres whereas 50 plots for sugarcane, 150 acres for rice and cassava, 50 for horticulture and the rest was for rented.

The number of inmates not placed and well produces the required production in that camp. The number of inmates was affected with frequently illness and fatigue because they worked over instead of having rest. Sometime prison staffs were placed

to the farm plots did farm works such as digging, planting and harvesting. One American researcher (Jiler 2006) in the topic "*Doing time in the Garden. Life lesson through prison horticulture"* proved that prisoners become healthier and minded when they were interring in gardening production when they were committed in prison centers.

4.5.4 Financial Budget on Agriculture in Prison Department

The Prison Department Report (2017/2018) showed that the only estimated budget was 20% that spent in agriculture while the rest of budget placed to Inmates services and other administrative expenditures. The results found that there was a very small budget allocated to finance agriculture. For the modern technological tools and system needed a special funds and projects to enhance agriculture in those producing camps. One assistant Superintendent of Prison said that:

> "*We are farming with hardship of minor support from the Head Office, we produce and no returns after feeding to inmates whereby the time for starting another farms we are going to ask for help but no our last effort"*

4.5.5 Poor Coordination with Other Stakeholders

There were many questions asked to both inmates, prison staffs and administrative personnel's concerning with stakeholders, they reply that there were many stakeholders such as Ministry of Land that dealing with accessible for land lease for prison camps has contribute more fully on measuring the camp plots and processing land lease. Other was Ministry of Agriculture that developed near relationship with prison department like providing 2 tractors for loan from SUMA JKT that replaced the old tractors that were not properly working. Irrigation or the lack thereof, was one of the major barriers for improved production and extension of work in the

Farm. There was tacit recognition by the researcher that the irrigation system in place, which barely drips into the Field across the ponds, limits immensely the potential to have multiple growing seasons. Other stakeholders were Tanzania Horticultural Association (TAHA), Tanzania Prison Services (TPS) they were very near for advising and training prison staffs on the developing agriculture and other sectors in prison camps (Zanzibar Prison Department Report 2017/2018).

4.6 Measures to Address Challenges Facing Agricultural Production In Prisons

The study showed that, production increased at Langoni penitentiary because they used irrigation system. Inmates spend much time in cultivating other crops. Other measured to address challenges facing agricultural production in prisons are presented hereunder.

4.6.1 Organization of Labour

The study showed that the organization of labour at the Langoni farm implemented by the administrator but usually delegated to the coordinators of the inmates' team. The coordinators in turn made the decisions to divide the inmates groups, the one that have long period in custody, second the inmate work in the field and third group into three the inmate that experienced in farm at the prison, each working in different areas of the Farm. In the field inmates work in pairs. All the work seems to be assigned equally.

4.6.2 Knowledge of Agriculture and Training

Study revealed that, there was a consensus by the tutors that nearly all of the inmates had no experience in agriculture prior to their work in the farm. One of the

coordinators said that not a single inmate had any experience in agriculture. Other tutors agreed with this observation, however, one tutor disagreed and said that somewhere around 10-20% of inmates had some experience on farming.

4.6.3 Agricultural Practices

The preparation of the land was one of the first aspects to consider when planning the agricultural season in prison setting. Despite the inmates little to no experience in agriculture the tutors affirmed that they did not encounter technical difficulties in cutting the bush while preparing the farm, or tilling the land with hoes.

4.6.4 Food Processing

The study shown that, some crops farmed by the inmates was insufficient to stay in long time before worst due to inject with high fertile concentration especial in Hanyegwa center. The Ubago penitentiary farm was still in its infancy. This study provided insight into the labour and agricultural production of the Farm in its second and third years of operation. The intent of the research has been to explore the workings of the Farm to provide insight into a project labeled as transformational by the administration to use inmate on food production so that to suit the food demands.

4.6 Soil Management

The study showed that 53 (26.2%) used Farm manure that use harvesting residue for soil fertility and plot setting, 55 of the inmate (27.2%) provided Mineral Fertilizers, 65 of the inmate (33.0%) uses wastes, 16 of the inmate (8.0%) keeps composite and 11 of inmate with (5.4%) use other techniques on soil improvement while production. This showed that, traditionally the prison department tended to inject on

natural land fertile techniques rather Industrial Chemicals fertilizers as table below clarified.

Table 4.13: Soil Management

Crops and food demand	Frequencies	Percentages
Farm Manure	53	26.2
Mineral Fertilizer	55	27.2
Waste	65	33.0
Composite	16	8.0
Others	11	5.4
Total	**200**	**100**

Source: Fieldwork, 2017

4.7 Dry Season Production

Study showed that 90 (44.6%) agree with the use of dry season farming process on keeping the land fertile and also 110 (55.4%) responds that the department were not well engaged on farming during dry season. The result evidently showed that the prison department has no enough capacity in modern techniques such as drip irrigation, green house farming and other modern types of farming. Therefore, the land stayed bared but other lands given to the community for short contract and the rest land planted seasonally.

Table 4.14: Dry Season Production

Dry Season Production	Frequencies	Percentages
Yes	90	44.6
No	110	55.4
Total	**200**	**100**

Source: Fieldwork, 2017

4.8 Not Burn Crop Residue Awareness

Burning crop residue was a common challenged in many local farming but in prison department the farming was a part of correctional services to inmates, whereas

burning residue were not allowed hence used to improve soil fertility. The study showed that 122(60.4%) agreed that having burned residue was a losing fertile land and 78 (39.6%) showed that there was a need to burn crop residue for soil improvement. According to results, there was a shortage of farming knowledge in some prison staffs as a result inmates receive what they are given. There were crop residues at Kinumoshi and Langoni from the rice harvesting; they took the residue and kept in Banana Trees for long water resistance.

Table 4.15: Not Burn Crop Residue Awareness

Not burn crop residue awareness	Frequency	Percent
Yes	122	60.4
No	78	39.6
Total	**200**	**100**

Source: Fieldwork, 2017

4.9 Farming Method Practiced in Prison Farms

Technological advancement and other needs for correctional services to offenders seen to be very productive hence becomes a major techniques in correctional for those short sentenced inmates and become behavior changed when they leave prison (Kathryn 2006). The results showed that 57 (82.2%) use zero tillage meant the prison camp keeps farming once in every year, other method was slash and spray with 44 frequency (21.8%) correspondent that use simple geared machines for spray and slashing like Kinumoshi and Langoni Farming plots, there was also slush and burn with 31 inmate (15.3%) and this method was famous in legumes farming at stoned lands such as Ubago and Hanyegwa Mchana Camps. Hoeing was 14 (6.9%) of inmate that used by inmates especially when they interring to farming in primary

correctional stage, hoes were mostly used in stoned and rough land. There was also Shifting cultivation with 11(5.4%) of inmate proves the uses of shifting cultivation which was very old farming method that depleted. Other farming methods was 1 (5%) that applied in farming in prison farms as below table identify.

Table 4.16: Farming Method Practiced in Prison Farms

Farming method	Frequencies	Percentage
Zero Tillage	57	82.2
Slash and Spray	44	21.8
Slush and burn	31	15.3
Crop rotation	42	20.8
Hoeing	14	6.9
Shifting cultivation	11	5.4
Other	1	5
Total	**200**	**100**

Source: Fieldwork, 2017

4.10 How Inmates heard about agriculture in prison

The results found that 122 (77%) of correspondents have an idea about agriculture in prison and they know that was a compulsory work for every inmates in the time before imprisonment, and those from short term sentences were normally used be provided agricultural techniques as a simple correctional program in African Prison (Kathryn 2006), also about 78 (23%) have no idea on agricultural in prison.

Table 4.17: How Inmates Heard About Agriculture in Prison

How Inmates heard about agriculture in prison	Frequencies	Percentage
Yes	122	77.0
No	78	23.0
Total	**200**	**100**

Source: Fieldwork, 2017

4.11 Where Inmates Heard About Agriculture in Prison

The data showed that, there was a three main communication transformation, sixty two of inmates (31%) got information on agriculture through radio whereby at the long sleeping period enabling inmates listening radio as a meant of refreshing their mindset , 95 (47.1%) through Television were used for those inmates stayed outside while they were not engaged in farming or other works outside, and 43 (21.5%) from social media like newspaper and other journals were very rare in prison as table shown in Table 4.18.

Table 4.18: Where Inmates Heard About Agriculture in Prison

Where Inmates heard about agriculture in prison	Frequencies	Percentage
Radio	62	31.0
TV	95	47.1
Social Media	43	21.5
Total	**200**	**100**

Source: Fieldwork, 2017

4.12 Existing Agriculture System in Prison Meets Food Demand to Inmates

"We don't have too much argument about producing varieties of farming products due to low budget but we ask Government to assist prison department on strengthening agriculture we can eat fresh food and vegetable because we have a capacity but we haven't enough budget for production" One Inmate from main camp Kiinua Miguu said. From the data collected showed that 46 inmate (23%) proved that prison production capacity was enough feeding those in castration while 154 inmate (77%) of correspondents agreed that, there was no enough capacity for producing what prison department needed for feeding inmates. As Table 4.19 shows.

Table 4.19: Existing Agriculture System in Prison Meets Food Demand to Inmates

Existing agriculture system in prison meets food demand to inmates	Frequencies	Percentage
Yes	46	23.0
No	154	77.0
Total	**200**	**100**

Source: Fieldwork, 2017

4.13 Causes Which Led To Agriculture To Be Worse In Prison Center

There were many questions asked relating to causes for worse productions in prison farms. The data showed that 141 (70.5%) of the correspondents agreed that the Technological deprived in agriculture was the most leading causes on Prison farms also the other causes like Small number of inmates ready for farming activities of 34 (17%), low production varieties of 19 (9.5%) and the low market price of 6 (3%).

4.14 Discussion of the Findings

4.14.3 Small Production Capacity in Prison Camps

The data from the correspondents (table 4.7.1) depicted the low productivity in prison, the production that did not serves the demands for inmates in prison camps, this also approved by the interview results from the inmates and staffs. The prison department has enough lands for various farming varieties but more than 70% of land are rented to public for their own production with short term agreement in Kangagani and Kinumoshi open camps, the covered land was estimated about 1,300 acres but the land occupied by prison plots was only 500 acres.

Those lands covered with water table and spring water bases where the government water investment were there. (Kathryn 2016) on the study about the effect of farming

Rehabilitation Programs on short term offenders done in Shikusa Farm prison at Kakamega in Kenya has been evidently proved that prison in many African countries have enough lands, very fertile, water available but there were other human capacity that leads agriculture not well advanced. Farming technology and expert personnel's was another setback on agriculture in Zanzibar prison department (table 4.7.1) the old technical capacity were invested in production camps there were only three (3) Tractors for those prison camps in Zanzibar (3) were placed at Langoni camp (1), Kinumoshi camp (1) at Unguja and Kangagani camp(1) at Pemba.

The data also proved that there was no any Green house package in prison farming plots, no drip irrigation package and only (2) trained staffs for farming management are placed who are revolving in all farming plots in (10) camps at Unguja and Pemba. There was also weakened farming plan in those important areas such as soil management, farm design, water and drainage system management plan and technical and fitting plans that can provide proper use of land. (Mboje 2013) shown that the placement of education both inmates and staffs in many correctional programs were countering with many challenges and sometimes were not formalized.

4.14.4 Contributions of Agriculture in Prison Department on Changing the life of Inmates

The data showed that, the agricultural products produced in the prison camps that feeds inmates influences more effort from the camps because it's observed that all inmates living in the farming regions were healthier than those stayed in town prison centers. The data indicated that from the financial years 2010/2011 the contribution

of the food from prison camps were rendered only 15% but in the recent budget the level increased 25% this meant that, from 12 months of the year about 3 months the prison camp has capacity on providing their food from the prison camps. This implied that, if the Government and the Prison department together changed and increased production and creates other value added product for exchanging with other market business like sugar, legumes, slats and other food spices (Zanzibar Prison Department Report 2017/2018).

4.14.5 Agriculture Training Programs

Provision of skills for inmates, training plans, evaluating the inmate's capacity frequently helped to develop their power and motives on agriculture hence used their skills when they left prison (Jiler 2006). The data from the inmate showed that, the training provided in vocational sites were not formalized there was only starting adult education timelines with language and simple mathematics in the only one main prison at Kiinua Miguu which carry 50% of the total inmates in Zanzibar while having a very dancer amount of remands who were not legally allowed working instead of voluntary participation on training but not works.

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instead of voluntary participation on training but not works.

4.5 Chapter Summary

The data established has shown that Zanzibar Prison Department has not meet the required platforms on conducting agriculture especially for those short term offenders that mostly were invaded in the farming camps. The data also proved that injection on modern tools and training awareness was no longer prioritized. By that, the general findings have shown that old technical perspectives on agriculture are overwhelmed, desire for modern technology is needed and prison staffs and technical personnel are ready. During the time in the prison farm the present of inmates and their at times active nature made to consider that interviewing inmates would have been a significant addition to the work.

The information provided by the tutors, other officials, and the supporting evidence gained through observation, however, proved sufficient for the scope and purpose of this research. Access to the prison farm, all inmates in Tungamaa Prison Farm, have been an important addition to the research and most likely result in gaining better insight on the food production and management program in prison. The prison farms and the irrigation program portrayed as a model that can transform prisoners through productive work. The production of the Farm early on was labour intensive, based on the labour of the inmates. It followed fairly basic agricultural practices and has minimal requirements of financial investment in the agricultural activities and inputs. The production levels of the Farm were relevant, but an emerging theme was that the continuous activity of the inmates was by far more important in mostly Zanzibar prison.

CHAPTER FIVE

CONCLUSSIONS AND RECOMMENDATIONS

5.1 Introduction

The part provided general conclusion of the findings per specific objectives and recommendations.

5.2 Conclusions

Finding of the study concluded the agricultural productions in Prison Department and its status did not meet the general food requirements in those prison centers. The techniques implied in prison not advanced to increase the availability of the resources on highlighting the agricultural production

The data depicted the results from the targeted correspondents such as Inmates (short term sentenced), prison staffs who were trainers of the inmates and some administrative personnel's who were managing and coordinating the agriculture in prison centers. The result showed that food production was low to fit inmate demand and more efforts needed to increase the production. The data also depicted that there was no coverage of various farming species such as short term farming such as horticultures and long term farming such as those farming that cover at least 6 months and above. Another areas was farming seasonally that were practiced in prison department, this method outdated whereby the farming was mostly practiced during rainy season leading to low productivity in prison camps. The data showed the inmates willingness on developing agriculture rather that eating food from outside countries.

6 The data lastly addressed the low support of agriculture from the main prison

administrative such as budget allocations and plans that can support agriculture to increase production in prison department

5.3 Recommendations

From the summary and concussions placed on the forgone pages the following recommendations were put forward.

i. Advanced technology should be invested to agriculture in prison camps, the use of tolls and equipment's such as drip and pivot irrigation services, heavy water and drainage system machines for irrigations, rechargeable spraying machines, provide greenhouse packages and provision of enough tractors and power tillers for every farming camp. These will simplify the farming from the small number of inmates available.

ii. Prison department have to specify the office with technical staffs that manages the agriculture in prison camps, this office should place at the main administrative for both Unguja and Pemba. This office will work on the planning preparations, monitoring and evaluating those activities relating to agriculture in prison camps. Obviously, this office will perform better on increasing productions in prison department.

iii. Prison department should increase farming on various varieties and strengthening horticulture. Varieties products will help on market competitions hence exchanging food available in the prison centers while farming on a big plots and this will be helped by stopping renting plots for public farming.

iv. The department has to provide necessary trainings for prison staffs, by doing that they will be ready for providing training to inmates that will increase correctional services through agriculture and increase productions accordingly. Training will help the departments conducting Training Need Assessment (TNA) and Training Plans (TP) that will reduce absence of technical support personnel on agriculture.

v. There is no development without research. The prison department should invest on small researches on soil management and testing, this are key issues before starting any productions in farming plots, the soil management will produce quality plants as well as crops.

vi. Government have to provide enough budget for strengthening agriculture in Prison department, the available land is ready for producing food and other market products such as sugarcane, sunflowers and horticultures.

vii. The government should support on introducing small factories in prison camps, these factories will help for value addition products such as those products from maize flour and cassava flour, cooking oil from sun flowers farming and these products can be used within the prison and other for outside markets.

viii. Coordination between prison department and other stakeholders relating to agriculture should be improved for technical and financial support, they may have a common linkage and hence enable agriculture be improved.

ix. Public awareness on inmates and agriculture should be improved, enhancing agricultural day and education through media will simplify awareness to public toward correctional and reintegration programs. This can also help

those public who are renting prison department lands for small farming while prison department invades a new motion on agricultural development strategies.

x. Prison department should provide land lease of those camps, this will reduce future conflicts between public and prison department. Land leases are very secure from other land user especially public and Political leaders.

5.4 Recommendations for Further Study

Study drew a platform for other research such as soil testing on Prison Farming Plots, Impact on the introduction of new farming technology in Prison Department, Inmates reintegration awareness on Agriculture. These areas will cover important parts on Prison Department on the purposes of providing Correctional Services in Zanzibar.

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APPENDICES

APPENDIX I: THE QUESTIONNAIRE FOR THE ASSESSMENT OF AGRICULTURAL PRODUCTION IN PRISONS TO MEET INMATES DEMANDS IN ZANZIBAR

The questionnaire intended to assess the agricultural production in prisons to meet inmate's demands in Zanzibar. Your responses used in a way that was detrimental. The information used for study purpose and treated confidential.

Questionnaire No: _____

SECTION ONE

1. ***(*Tick where appropriate √*)***

a. Age: [20-30], [31 – 40], [41 – 50,] [above 51]

b. Sex: [Male] [Female]

c. Marital status: [Single], [Married], [Widow]

d. Level of education: [Primary level], [Secondary level], [Higher level] [Vocational training]

SECTION TWO

Tick where appropriate and explain or mention where needed. If the space for the explanation or opinion does not allow the use of a separate sheet

5. Have you heard about the agricultural activities in prison

a) Yes [ ]

b) No [ ]

6. If yes where did you hear

   c) Through radio[ ]

   d) TV [ ]

   e) Social media [ ]

   f) Other sources, mention_____

7. Did existing agricultural system in prison meets food demand to inmates?

a) Yes [ ]

b) No [ ]

8. Gave the reason to support your answer_____

_____

9. Did the type of agriculture offered by prison match with inmate needs?

   a) Yes [ ]

   b) No [ ]

10. What type of foods grown in prison center, mention?

_____

   a) Are there any causes which led agriculture to be worse in prison center?

   Yes [ ] b) No [ ]

11. If Yes mention them at least two causes

   a)……

   b) …….

14. Did you think that, there is a need to continue practice agriculture in prison of Zanzibar?

a) Yes [ ]

b) No [ ]

15. Explained the reasons for your answer above

a)……

b)…….....

c)……

(if the space not enough for your answer you can add an extra sheet)

16. What kind of food grown in prison that most feed the inmate?

……

17. Have you ever heard about the crops grown in prison but waste the resources?

a) Yes [ ]

b) No [ ]

if yes mention ….....

18. Mention the challenges that faced prison while practices agriculture

……

……

19. Suggest measures to resolve the above challenges

……

20. Have you heard about the reformative agricultural programs offered by prison authority?

a) Yes [ ]

b) No [ ]

21. If yes, can you mention at least two?

a) ……..

b) …….

22. Do you think, programs mentioned above are effective enough to change the mode of practiced agriculture in prison?

a) Yes [ ]

b) No [ ]

23. If yes mention your reason to support your affirmative response.

……

……

24. Do you think prison authority has capacity to change the agricultural system in prison center?

a) Yes [ ]

b) No [ ]

25. If yes, explain how

---

27. What are needed to capacitate the prison authority in effectively dealing with modern agricultural techniques?

……

……

29. Mention/recommend at least two areas which need to be given priority in the process of the changing the agricultural production in the prison affairs.

30. Do you think the community understands the concept of prison agriculture?

a) Yes [ ]

b) No [ ]

31. Did the techniques used in agricultural production serve inmate need?

……

Thank you

APPENDEX II: INTERVIEW GUIDE FOR THE ASSESSMENT OF AGRICULTURAL PRODUCTION IN PRISONS TO MEET INMATES DEMANDS IN ZANZIBAR

Name of prison center ……

Name of Officer interviewed: ……..……..

Date of interview: …….…….....

1. What are the interventions between the agricultural production in prison and outside?
2. Are there any problems which face the inmate and staffs in the form of growth and the yields of their productivity in prison setting?

   If yes! It faces by which problems?_____
3. Can you compare the number yields for food production in prison from one season to another?
4. Do you understand about the agricultural production in prison?
5. How agricultural production in prison affects the inmate demand?

APPENDIX III: OBSERVATION GUIDE

1. To examine if prison centre being able to buy food for the inmates needs.
2. To view how tradition and customs approach of agricultural production affects food production in prison setting.
3. To observe the amount of food produced fits the inmate needs.
4. To monitor activities inmates performs against agricultural in prison at a day.
5. To detect staffs performance in controlling agricultural yields.
6. To observe how inmates supported during harvesting to fulfill their needs.