



BUNGOMA COUNTY POTATO STRATEGY



Foreword

The Bungoma County Potato Strategy is aimed at guiding the stakeholders and the development partners in aligning development initiatives and interventions in order to accelerate growth and development of the potato industry in the County. This will be important in creating synergy in addressing challenges in potato value chains for the benefits of all value chain players. The potato strategy will guide various stakeholders' and development partners initiatives to ensure there is no duplication of activities. This will lead to proper utilization of resources by all in the implementation of activities and interventions in the potato value chain.

The strategy has an overarching goal to improve potato production for food and nutrition security, income generation and livelihoods through Investment in seed production and distribution within the county, participatory evaluation of potato breeding lines, variety and seed potato technologies demonstrations, Improvement of production capacity of high-quality seed potato to farmers, increasing production and productivity of ware potatoes promotion of mechanization and irrigation technologies, and improvement of pre and post-harvest management of potato produce, market access, enacting and enforcement of policies and regulations. This will enhance development of potato value chain.

The County Government is committed to ensure full implementation of the Potato Strategy. The development partners and stakeholders are encouraged to fully participate in this endeavour. Let me take this opportunity to welcome private sector investors to invest in potato value chain in the County.

Acknowledgement

Potato is a key enterprise in the County and contributes enormously to food security, income generation and employment in the county. The Bungoma County Potato Strategy (Bungoma CPS) is crucial in guiding the development of the potato value chain in the County. The Strategy is aligned with the National Potato strategy, vision 2030 and government big four Agenda (2018-2022). The County Government of Bungoma acknowledges the partnership with National Potato Council of Kenya in providing the technical support for the development of the strategy. We are thankful for the financial support offered by development partners such as GIZ through ‘Promotion of nutrition sensitive potato value chain in East Africa’. We appreciate every stakeholder who worked to see successive development of this strategy.

Table of Contents

| | |
|--|------------|
| FOREWORD | II |
| ACKNOWLEDGEMENT | III |
| FIGURES | V |
| TABLES | VI |
| EXECUTIVE SUMMERY | VII |
| CHAPTER 1..... | 1 |
| 1.0. INTRODUCTION..... | 1 |
| 1.1: Background | 1 |
| 1.2 Overview | 4 |
| CHAPTER 2..... | 6 |
| 2.0. SITUATION ANALYSIS | 6 |
| 2.1. Potato production in Kenya and Bungoma | 6 |
| 2.2. Ware potato | 7 |
| 2.3 Mechanization and use of irrigation in potato production | 7 |
| 2.4. Seed system | 8 |
| 2.5. Varieties | 8 |
| 2.6. Major pests and diseases | 8 |
| 2.7. Marketing | 9 |
| 2.8. Post-harvest | 9 |
| 2.9. Consumption Patterns | 9 |
| 2.10. Potato Policy in the County and legal framework..... | 9 |
| 2.11. Coordination, partnership and low funding..... | 10 |
| 2.12. Projected Net Income per Capita per Day..... | 10 |
| 2.13. Rationale of the Bungoma CPS..... | 11 |
| 2.14. The Roles of Partners in the strategy | 12 |
| CHAPTER 3..... | 13 |
| 3.1. POTENTIAL, OPPORTUNITIES, CHALLENGES AND CONSTRAINS (POCC)..... | 13 |
| CHAPTER 4..... | 15 |
| 4.0. STRATEGIC GOALS, STRATEGIC ISSUES AND STRATEGIC INTERVENTIONS | 15 |
| 4.1. STRATEGIC GOAL..... | 15 |
| 4.2. Strategic issue 1: Inadequate seed potato production and poor distribution system | 15 |
| 4.3. Strategic issue 2: Low ware potato production | 15 |
| 4.4. Strategic issue 3; Limited market access, Low investment in value addition and poor consumption. | 16 |
| 4.5. Strategic issue 4: Weak/Lack of Potato Policy in the County and legal framework | 17 |
| 4.6. Strategic issue 5: Weak Coordination, partnership and low funding | 17 |
| CHAPTER 5..... | 19 |
| 5.0. IMPLEMENTATION MATRIX..... | 19 |
| CHAPTER 6..... | 31 |
| 6.0. MONITORING AND EVALUATION..... | 31 |

FIGURES

Figure 1: Proximity to water resources suitability map.....2
Figure 2: Proximity to road and rail suitability map3
Figure 3: Potato production suitability5
Figure 4: Comparison of productivity7
Figure 5: Livelihood transition graph..... 11

TABLES

| | |
|--|----|
| Table 1: Potato Production trends | 6 |
| Table 2: pests and diseases | 8 |
| Table 3: Livelihood transition table | 10 |
| Table 4: POCC analysis | 13 |
| Table 5: Implementation..... | 19 |

Executive summery

Bungoma County, like many other main potato producing counties is faced by many challenges in potato value chains that limit the potential production of potatoes and lower the potato productivity. These challenges includes: inadequate certified and disease-free seed potato, lack of market information and awareness among the potato growers leading to exploitation by middlemen, poor pre- and post-harvesting practices and techniques, poor handling, packaging and marketing practices, low value addition and poor marketing infrastructure. Consequently, these challenges have lowered farmers' income and the contribution of the subsector to the economy of Bungoma County.

In the effort to address the above challenges; the Bungoma County Government working in collaboration with NPCCK other key partners and stakeholders embarked on development of the Bungoma County Potato Strategy. The strategy is aligned with the National Potato Strategy, 2016-2020, vision 2030, Government big four Agenda and Bungoma County Integrated Development Plan (CIDP). Its' intended to harmonize the activities of different actors geared towards development of potato sub sector in the county and guide the growth of potato value chain for improved potato production, food and nutrition security, income generation and livelihoods. The strategy development followed through the following steps;

1. Consultative meeting between the key partners
2. Development of thematic areas of the strategy by key stakeholders
3. Potato Value chain Stakeholders' meetings
4. Technical team review

The Strategy encapsulates the status and performance of the potato value chain in the Bungoma County, identifies the constraints and challenges that hinder optimal performance and gives interventions for various challenges. It describes the current production, distribution and use of seed and ware potato, and identifies the barriers and bottlenecks hindering efficient performance. This is described through various strategic issues and objectives identified by stakeholders acting in the potato sector in the Bungoma County. It also gives the targeted status and budget estimates of the intervention areas over the next five year period, and provides estimates of potential economic benefit and outcome for the Bungoma County in adopting the recommendations.

CHAPTER 1

1.0. Introduction

1.1: Background

Bungoma County is one of the 47 counties in Kenya found in Western region. It borders Republic of Uganda to the North west, Trans-Nzoia County to the North East, Kakamega County to the East and South East and Busia County to the West and South West.

It has a total area of 3032.2km² divided administratively into nine sub counties namely, Tongaren, Kanduyi, Sirisia, Kabuchai, Webuye East, Webuye West, Bumula, Kimilili and Mount Elgon. Bungoma county has a population of 1.81 million (KNBS Analytical report 2016). Population densities ranges from 50 to 3739 persons per Km². Projections of 2018 are 949 persons per Km².

The County experiences two rainy seasons with long rains experienced from March to July and short rains in August to November. Annual rainfall ranges from 400mm to 1800mm and annual temperatures varies between 0⁰c to 32⁰c due to different levels of altitude with the highest peak of Mt. Elgon recording slightly less than 0⁰c.

The County has 2,880.78km² of arable land under agriculture, forestry, mining, human settlements, business, social and public amenities. Land tenure in the County is either freehold or leasehold with an average holding of 1 ha per household.

There are several reliable water sources within the county comprising of rivers, dams, boreholes and shallow wells which can be used for irrigation.

The County has several highways including the great North Corridor that connects Kenya to Uganda from Mombasa Port and the Sirare via Webuye-Kitale to South Sudan border. The county is located 95km from Kisumu International Airport and 100km to Eldoret International Airport as a desired destination, attracting and retaining investors giving it a comparative advantage as an investment and trading destination.

Figure 1: Proximity to water resources suitability map

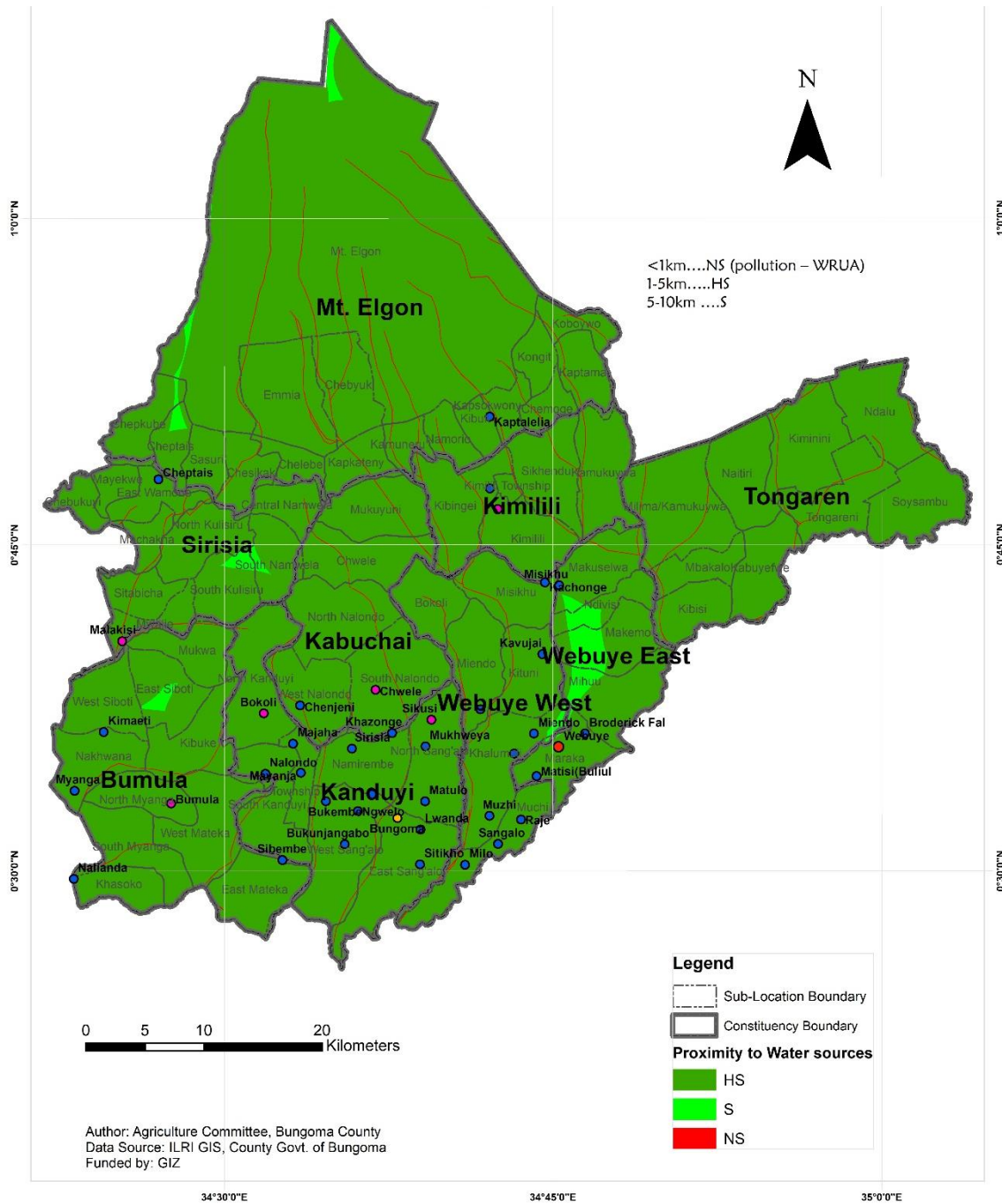
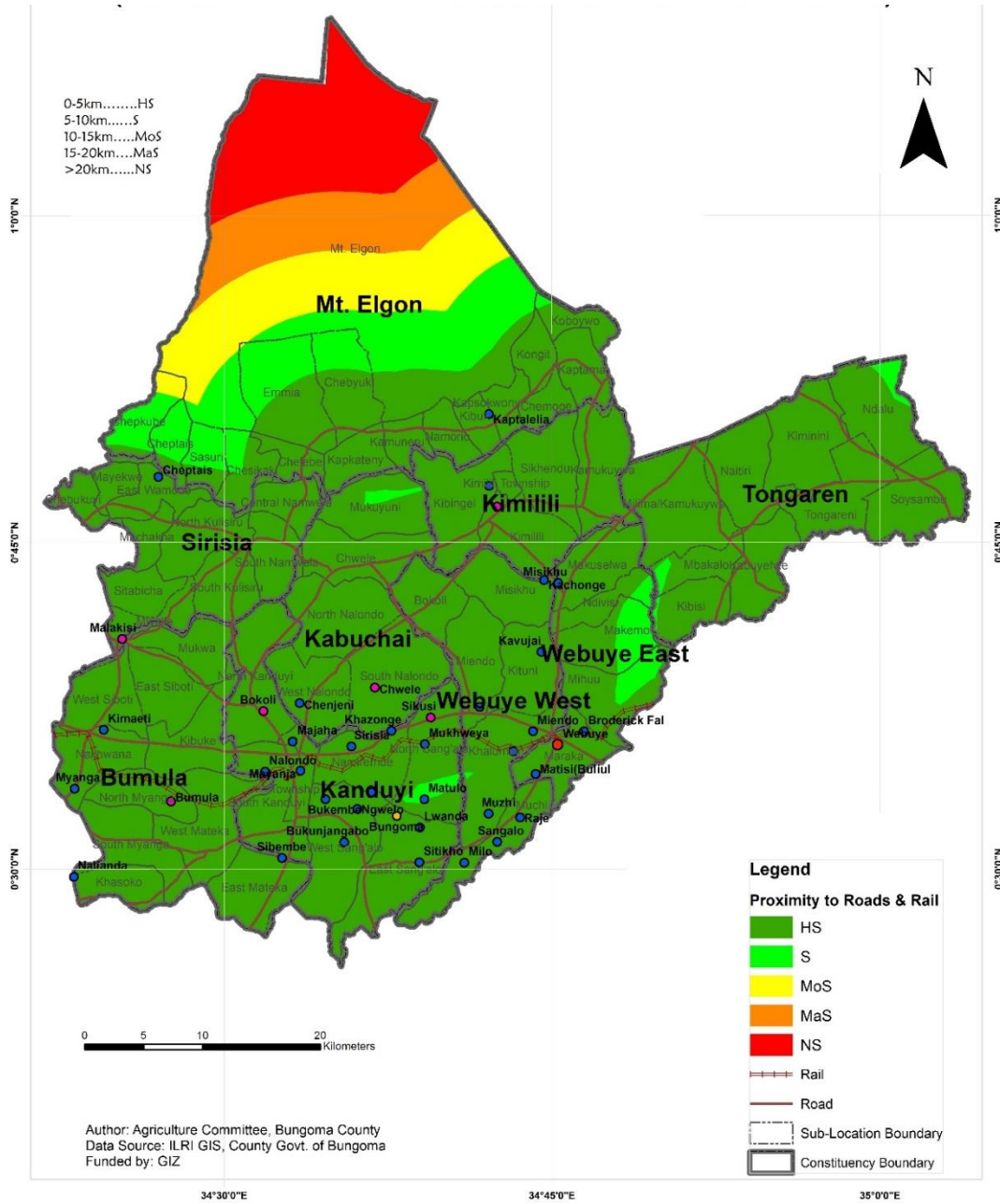


Figure 2: Proximity to road and rail suitability map



1.2 Overview

The agricultural sector is the backbone of the Kenyan economy; contributing directly 25% of Gross Domestic Product (GDP), 60% of export earnings and 75% of the country's industrial raw materials. Moreover, through links with manufacturing, distribution and service-related sectors, agriculture indirectly contributes a further 27% of the country's GDP. The sector employs more than 40 per cent of the total population and more than 70 per cent of Kenya's rural people¹.

Agriculture is critical to the overall economic and social development of the country and is expected to drive the economy to the Kenya Vision 2030 projected 10 % annual economic growth over the 2010-2030 period. The blue print aims to transform Kenya into “a newly-industrializing, middle income country providing a high quality of life to all its citizens in a clean and secure environment”² contributing to two pillars of the Big 4 Agenda (i.e. Food and Nutrition Security and Manufacturing).

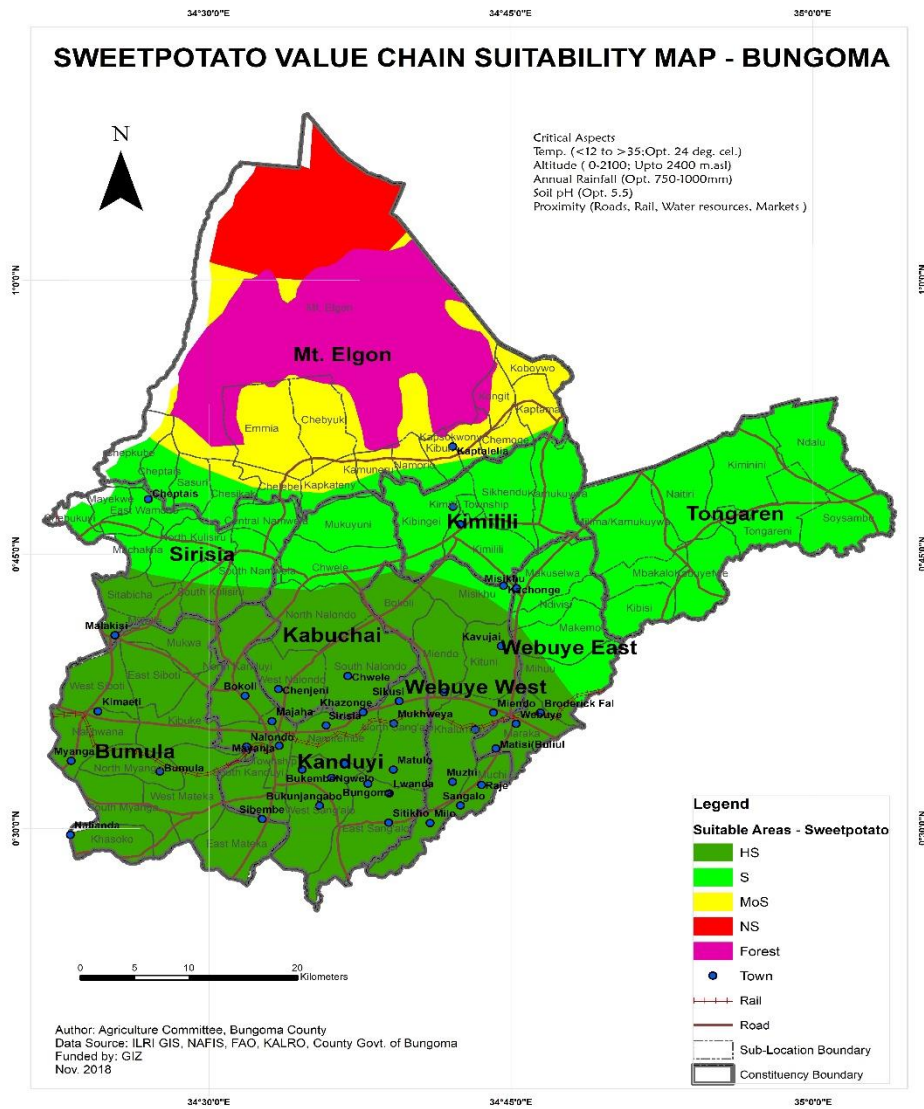
Root and tuber crops are second in importance to cereals as a global, national and local source of carbohydrates. In Kenya, root and tuber crops are important food crops that have gained increased importance due to their role in food security, ability to withstand drought as well as their potential for commercial processing. According to the ministry of agriculture reports, the main root and tuber crops produced in Kenya are Irish potatoes, sweet potatoes, cassava, arrowroots and yams. Earlier on, root and tuber crops were regarded as marginal crops with limited production and utilization, despite their great potential in the food, feed, pharmaceutical and paper industries. In Bungoma County, potatoes have been grown over the years as major food security crops with little regard to commercial enterprise.

1.2.3. *Potato (solanum tuberosum)*

Potato is a shrubby annual crop with edible tubers, grown as cool-weather in rows, raised beds, or containers, are native to the South American Andes. Though introduced to the world by early European explorers only in the past four hundred years, the starchy tubers quickly became one of the world's most important and nutritious foods, behind maize, wheat, and rice.

In Kenya, Potato is the second most important crop after maize in terms of consumption. It is grown by approximately 500,000 small scales on 120,000 hectares and with an average yield of 7.7 tons per hectare. It is grown by more than 800,000 farmers generating more than Sh50 billion to the country. There are 13 major potato producing counties in Kenya and they include Nyandarua, Meru, Nyeri, Kiambu, Taita Taveta, Nakuru, Narok, Bomet, Elgeyo Marakwet, Trans Nzoia, Bungoma, Uasin Gishu and West Pokot. Bungoma County production has been increasing and in 2016 the county contributed 11.75% to the national production. (2,119,979). Previously Potato was grown in Mt. Elgon and Kimilili sub counties but other potential sub counties include; Tongeren, Sirisia, Kabuchai, Webuye East and Webuye West. Potato are an important food crop and main source of carbohydrates and vitamins. It's also source of cash to households.

Figure 3: Potato production suitability



CHAPTER 2

2.0. Situation Analysis

2.1. Potato production in Kenya and Bungoma

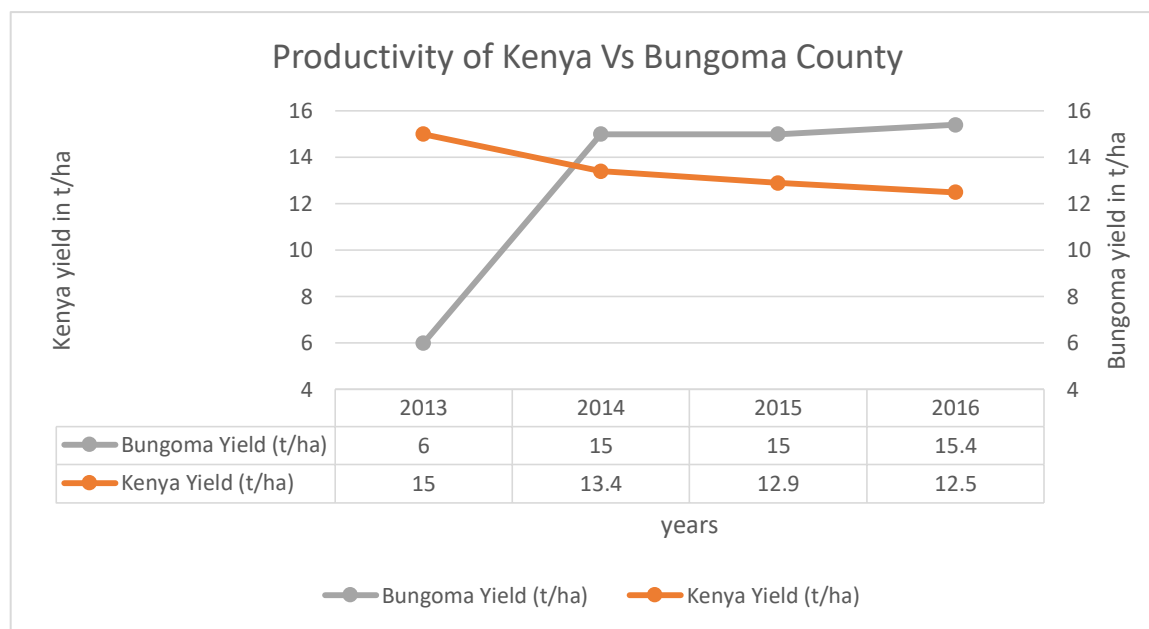
Potato is an important and widely cultivated crop enterprise in Bungoma County in Mt. Elgon sub-county and its catchments. It plays a crucial role in terms of contribution to food security, poverty eradication, and economic development in the County. The crop is cultivated by about 20,155 farm families in the County both for subsistence (approx. 10%) and commercial purposes (approx. 78%) the rest (approx. 2%) is used as farmer own saved seed. The crop is mainly produced by small scale farmers who own between 0.25 - 2 acres per season in two major seasons (March/April – June/July and July/August-October/November) and one minor season (October/November- Jan/Feb). The average area of production is 1739Ha per season producing 43,521 tonnes annually of ware potatoes. This earns the farmers Kshs 870 Million per year making it one of the most important crop enterprises in the County. The current average yield of Irish potatoes in the County is 17.5 metric tonnes per hectares against the potential production of 40 metric tonnes per hectare under good agronomics practices. Consequently farmers' income is depressed while the market and consumption of potatoes are increasing due to increased urbanization and change in feeding habits

Table 1: Potato Production trends

| Year | Kenya | | | Bungoma County | | |
|------|-----------|----------------|--------------|----------------|----------------|--------------|
| Year | Area (ha) | Production (t) | Yield (t/ha) | Area (ha) | Production (t) | Yield (t/ha) |
| 2013 | 117,495 | 1,758,800 | 15.0 | 350 | 2100 | 6.0 |
| 2014 | 131,200 | 1,757,100 | 13.4 | 650 | 9750 | 15.0 |
| 2015 | 149,876 | 1,927,974 | 12.9 | 931 | 13895 | 15.0 |
| 2016 | 169,796 | 2,119,979 | 12.5 | 663 | 10210 | 15.4 |
| 2017 | | | | 1181 | 17715 | 15.0 |
| 2018 | | | | 1739 | 30362 | 17.5 |

Source- Food and industrial crops annual reports and County Horticultural validated Reports.

Figure 4: Comparison of productivity



The table above indicate a fluctuation in productivity for both Kenya and Bungoma County. Productivity for the country reduces as from 2013-2016 whereas in Bungoma it increases attributed to more stakeholder engagement in the potato value chain within the County.

2.2. Ware potato

There has been low Ware potato production which has been attributed to various factors which include; inaccessibility and low use of certified and clean seed potato by Bungoma farmers, pest and diseases prevalence such as bacterial wilt and emerging PCN affect s the quality of potato. There is also declining soil fertility due to poor soil management practices, insufficient mechanized services leading to post-harvest losses, poor agricultural farming practices and inadequate extension and information exchange platforms.

2.3 Mechanization and use of irrigation in potato production

Most smallholder farmers use manual labors hence inadequate use of farm machineries during farming activities such as ploughing, harrowing, planting ridging, and harvesting as offered by Agricultural Mechanization Services (AMS). Some farmers are not aware of the existence of the mechanization services in Bungoma County leaving the farmers with the only option of hiring Laborers which is becoming more expensive, time consuming and in some cases not available when needed leading to season delay/untimely planting. Consequently this has led to low productivity of crop land in the County. Smallholder farmers are usually not able to afford machinery individually and there is also limited machinery for farming since farmers do farming at the same time.

Most farmers rely on rain-fed production for potato farming in the County. The potato growing areas are within Mt Elgon long and short rains experiences hence high potential for irrigation production with proper water harvesting measures. There are also neglected dams and boreholes which require to be rehabilitated. This will enhance extension of potato production to Mt Elgon catchment areas and continuous potato production.

2.4. Seed system

In Kenya, the informal seed system is the main option through which most potato farmers obtain potato seeds. This is because there is an inadequate supply of certified seeds. The informal seed sources include farm-saved, local markets, and neighbors. Self-supply forms the major source of seed for most farmers who select the small tubers as seed from the ware potatoes. Development partners including GIZ, CIP together with KEPHIS and KALRO have stepped up on production of quality seeds in potato producing areas.

In Bungoma County, the informal seed system is still the main source of seeds. Selected and trained seed multipliers are supplied with quality primary seed from KALRO centres at Tigoni, ADC Molo, Embu and Oljoro Orok produce quality seed with advisory inspection support from Kenya Plant Health Inspectorate Service (KEPHIS). There is no registered seed merchant situated in Bungoma County, and this make seed potato expensive to small farmers due to high transport cost.

2.5. Varieties

There are very many varieties, which differ in shape, size, colour, flavour and starch content. They include;Tigoni, Shangi, Kenya karibu, Kenya Mpya, Sherekea, Ambition, Laura, Lady Amarilla, Derby, Markies, Sagitta, Saviola, Musica, Royal, Jelly, Faluka, Purple gold, Challenger, Evora, Panamera, Rodeo, Sifra, Konjo, Carolus, Zafira, Milva and Mayan Gold, among others.

The most common variety planted in Bungoma by the farmers used to be referred to as Alkar. The variety is generally known to be of very low yields with a higher shelf life. New high yielding varieties such as Shangi and Unica, were introduced by NuSePPP project in 2017. More farmers embraced Shangi due to its high yields and early maturing characteristics. Another variety has been adopted by farmers from Uganda called Kabale which has gained more traction by farmers as it is more resistant to blight.

2.6. Major pests and diseases

Table 2: pests and diseases.

| S/No | Pest |
|------|--------------------|
| 1 | Tuber Moth |
| 2 | Root knot nematode |
| 3 | Leaf miner |
| 4 | Aphids |
| 5 | White flies |
| | Disease |
| 1 | Late blight |
| 2 | Fusarium wilt |
| 3 | Bacterial wilt |
| 4 | Potato leaf roll |
| 5 | Early blight |

2.7. Marketing

Majority of the farmers (63%) sell their crop directly off the farm. The remaining 27% is mostly stored for seed and home consumption. Previous data indicate that 80% of the total potato production in Kenya is sold via local markets or traders while farmers use 20% of the production to consume at home. The potato is sold and processed in local towns and market centres into French fries (chips) or potato chips (crisps) by processors.

In Bungoma County, the population provides market with increasing consumption rate amongst the youth in the County. Majority of potato farmers in Bungoma county are smallholders (<2acres) who are unable to invest heavily in production, or organize themselves for markets. Currently, there is no organized store or collection centre for the potato produced. The unstructured marketing system in the potato value chain encourages farmers' exploitation by the middlemen and limits access to market information. Like other counties, Bungoma County has marketing challenges such as; poorly organized farmers, lack of a structured marketing platform, pricing challenges due to the extended bag menace, exploitation from middlemen, seasonality of production and poor adoption of preferred market varieties which impedes access to premium markets.

2.8. Post-harvest

Poor pre- and postharvest management is a major constraint to year-round utilization of potato. Some of the factors the factors that lead to low prices include poor standardization, excess supply of potatoes during peak periods. Improving pre- and postharvest management would extend the marketing window for potato farmers while maintaining product quality, enhancing branding and traceability. Extending the period of availability may further stabilize prices, thus increasing accessibility to potatoes for household consumption and making them more appealing to agro-processors. This can also create opportunities along the value chain. The prices of potatoes can only be consistent if marketing is organized and well structured.

2.9. Consumption Patterns

In Bungoma County, maize is the staple food crop. The bulk of potato produced is sold for family income and little is left for household consumption. There is therefore a need to promote the consumption of the potato in healthier forms. Most potato farmers do not have information on the nutritive value of the potato which most of them believe that it only contains starch and meant for the wealthy families.

2.10. Potato Policy in the County and legal framework

The National Potato strategy is the overall guide for the potato value chains activities and initiatives which give a clear implementation framework for various interventions. The County Integrated Development Plan (CIDP 2018-2022) gives the general agricultural activities at County level. The Acceleration of potato value chain growth however requires crop-specific regulations that will facilitate improvement of production and enhancement of marketing within and between Counties and in the region. There exists a root and tuber crops strategy in draft which is in the final stages of development. Development partners have built capacity of staffs to develop/ formulate policies, however the county government doesn't have adequate financial resources to implement the Policies.

Currently, the regulations being put in place for storage and warehouse receipting systems are mainly

targeting cereals while potato contract farming needs to have a supporting legal framework. The implementation of accreditation/ authorization of seed certifications also not well structured to benefit potato value chain. These shows the need for stakeholders and policy makers to engage at county and national levels to draw/harmonize policies and regulations supportive to the growth of the industry.

2.11. Coordination, partnership and low funding

The budget allocation depends on the activities priorities indicated in the work plans. Agriculture despite being the backbone of Kenyan economy has suffered budget setback which is less than 3% against Malabo commitment of 10% national budget allocation. In Bungoma the allocation is less than 8% with the total county budget. The low investment has been due to lack of work plans and implementation framework for agricultural activities and over-dependence for donations and grants. This has limited the growth for potato value chain and agriculture in general.

Potato value chain and programmes are implemented by various partners who are not effectively coordinated resulting in inefficient use of resources and lack of information and knowledge sharing among the players. This strategy seeks to harmonize the operations of existing and potential players in the potato value chain. It further stipulates code of conduct and legal framework in terms of administrative structures and operational procedures when engaging stakeholders.

2.12. Projected Net Income per Capita per Day

Kenya aspires to be a middle level income and newly industrialized country with high quality of life by the year 2030. As explained in vision 2030, where net income per capita per day should be above ksh200 (\$2). Therefore in Bungoma situation an average household of six should have an income of more than Ksh1200 (\$12) per day to start emerging from poverty farming on an average area of 1.75 acres and Ksh 1,800 to join lower middle income bracket farming on an area of average 2 acres.

Analysis of the projected net income per capita per day for Bungoma county families growing potato give an indication that majority of the farmers are poor and are likely to remain so for a long time. For example at the current production of 70 bags/acre, a farmer will take more than six years to emerge from poverty(Ksh200 per day per person) when (the number of household dependents reduce) and other factors of production held constant. Potato farmers can commercialize through either increasing acreage, improving on productivity or both. The interventions to address productivity includes high quality seed, appropriate fertilizers, proper pests and disease management. Acreage under the crops can be increased through irrigation or leasing of land.

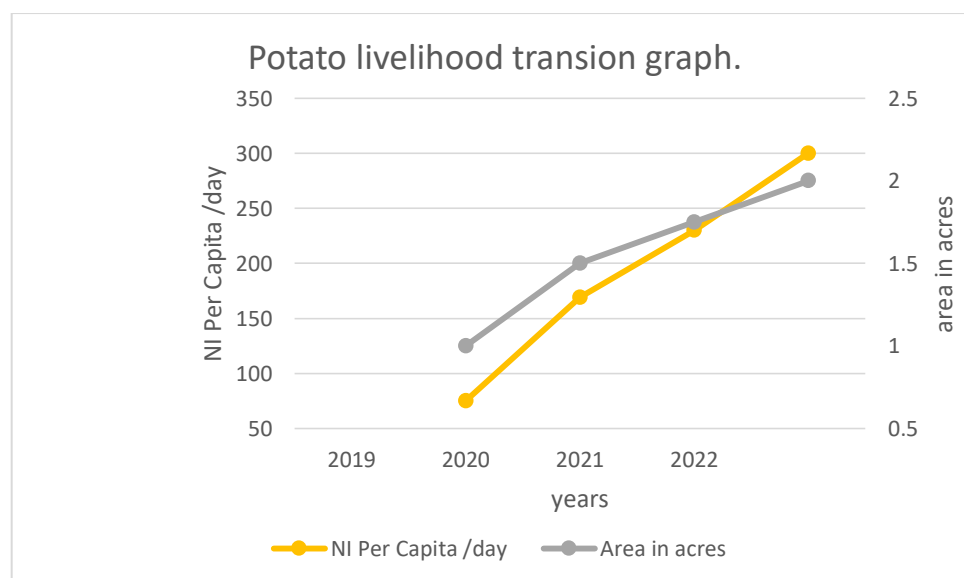
Given that production potential for potato is 140bags/acre in Bungoma, commercialization of sweet potato can be achieved through a combination of productivity level of 140 bags/acre and an acreage of 2acres within one year as shown in the table and graphs below.

Table 3: Livelihood transition table

| NAME OF VALUE CHAIN: Potato | | | | | | LIVELIHOOD TRANSITION LEVELS | | | |
|-----------------------------|--|--|--|--|--|------------------------------|--|--|--|
| Year | | | | | | | | | |

| | Yields in bags/season/acre | Price KES/kg | Production Costs/season/acre | Gross Income/year(2 seasons) | NI per acre/year | HH Size | Area in acres | NI Per Capita/day | Transition Level (P, E, C) |
|------|----------------------------|--------------|------------------------------|------------------------------|------------------|---------|---------------|-------------------|----------------------------|
| 2019 | 70 | 2000 | 115700 | 280000 | 164,300 | 6 | 1 | 75 | Poor |
| 2020 | 105 | 2000 | 173550 | 420000 | 246,450 | 6 | 1.5 | 169 | Poor |
| 2021 | 122.5 | 2000 | 202475 | 490000 | 287,525 | 6 | 1.75 | 230 | Emerging |
| 2022 | 140 | 2000 | 231400 | 560000 | 328,600 | 6 | 2 | 300 | Lower middle income |

Figure 5: Livelihood transition graph



2.13. Rationale of the Bungoma CPS

Agriculture plays a key role in the economy both at national and county level. The Kenya Vision 2030 is the overarching policy document that forms the foundation on which agriculture sector policy documents are derived and investment plans based. The agriculture sector and specifically ASDS form a key element of the economic pillar in Vision 2030. This is further emphasized in Medium term plan II (2013-2017) and medium term plan III (2018-2022). The aspect of nutrition is captured under the sub-sector policy “food and nutrition security policy 2012. Other national policy in support of agriculture include: National Agribusiness Strategy, National Horticultural Policy, June 2012, National Agricultural Research System Policy, July 2012 and The National Seed Policy.

The National potato strategy overall provide the roadmap for the Potato industry activities and initiatives and describe in details the constraints, challenges and opportunity along the potato value chains. Following

the devolvement of agriculture activities in Counties, it is necessary that the national strategy to be domesticated and implementation framework to be developed to facilitate potato value chain growth at County level.

The Kenya constitution 2010, Schedule 4, The County Government Act 2012 and the legal notice No.139 allow county governments to among other responsibilities formulate and review county specific policies and strategies. Some of the policies developed under the county government include the following: Agriculture Farm Input Support Policy, Weights and Measures Policy, Bungoma CIDP 2017 -2022 and Bungoma County Strategic Plan. However commodity specific strategies have not been formulated hence making it difficult to address commodity specific challenges and opportunities. The development of the Bungoma county potato strategy will go a long way in addressing the unique issues in potato value chain.

2.14. The Roles of Partners in the strategy

The County government of Bungoma embraces roles played by partners in implementing programmes under the PPP arrangement. It endeavors to create an enabling environment that provides legal, policy, infrastructural, and other initiatives to supporting implementation of the Bungoma CPS with other actors. Stakeholders landscape incorporates all actor categories including Growers, Input suppliers, Seed merchants, Agro-processing, Business Development Services (Traders, Finance, Transporters, storage), Research& Extension, Lobby & advocacy, Promoters, Regulators, County government, NGOs, Development partners e.t.c. Actors within the sub-sector need to align their potato activities with the Bungoma CPS and the Bungoma agricultural sector platform (BASP).

CHAPTER 3

3.1. Potential, opportunities, challenges and constrains (POCC)

Production of potato crop in Bungoma County has been faced by several challenges including Land fragmentation, high incidences of Pest and diseases, lack of policy and strategy for the crop, inadequate quality planting materials, highly degraded soils and seasonality of production.

For every challenge and constraint in the county, there are opportunities and potentials that can be used to overcome. An analysis of existing potentialities, opportunities, challenges and constraints affecting potato value chain development in the County is presented in table below.

Table 4: POCC analysis

| Potential | Challenges |
|---|--|
| <ul style="list-style-type: none"> ✓ Infrastructure and linkages that opens up the County and cross border market. ✓ Ideal climatic conditions that favour production of tuber crops(rainfall, temperature and soils) ✓ Existence of institutions which offers skill development and research ✓ Existence of organizations promoting Potato value chains in the county. ✓ County's High population which provides labour and market. ✓ Political good will from the County government to support tuber crop production. | <ul style="list-style-type: none"> ✓ Land fragmentation ✓ Labour intensive farming systems since the terrain can't allow mechanization. ✓ High incidences of Pest and diseases such as potato cyst nematodes and bacterial wilt ✓ lack of policy on Potato development in the County ✓ Lack of organized collection centers for aggregation of produce. ✓ Inadequate seed potato materials ✓ Lack of investment incentives- high cost of electricity, water, communication and capital ✓ Negative consumer preference ✓ Highly degraded soils ✓ Exploitative middle men. |

| Opportunities | Constraints |
|--|--|
| <ul style="list-style-type: none"> ✓ Availability of land for buying and leasing ✓ Availability of water for irrigation. ✓ Utilization of credit facilities existing in the county ✓ Increased demand for new varieties and products due to changing trends and urbanization ✓ Potato has high nutritive value making it easily acceptable. ✓ Availability of efficient new technologies in seed potato production ✓ Existing opportunities to expand production to Mt. Elgon catchment areas ✓ Changing eating habits in favor of potato and potato products (salads, bhajia, chips and crisps) | <ul style="list-style-type: none"> ✓ Climate change with unpredictable seasons ✓ Inadequate primary processing facilities and machines ✓ unfavorable credit conditions ✓ Competition from other enterprises ✓ High incidence of new strains of pests and diseases like cysts nematode and Potato wilt. ✓ Unavailability and shortages of quality seed for planting |

CHAPTER 4.

4.0. Strategic goals, strategic issues and strategic interventions

4.1. Strategic Goal

To improve potato production for food and nutrition security, income generation and livelihoods

4.2. Strategic issue 1: Inadequate seed potato production and poor distribution system

Objective 1: Increase seed production and distribution within the County

Specific proposed interventions

- a) Designate and deliberate allocation of public land for seed potato production by the County governments of Bungoma
- b) Train seed producer farmers in the County.
- c) Provide favorable policy environment for private sector investment
- d) In collaboration with other stakeholders' the County agricultural office will support construction of diffuse light stores seed storage

Objective 2: Establish demonstration trial plots of new varieties and seed potato production technologies

Specific interventions

- a) The County agricultural office in partnership with other potato stakeholders and project would set up demonstration trials at sub-county levels for KEPHIS registered varieties with good processing qualities (Chips, Crisps) to create awareness on released varieties and therefore offer farmers new market opportunities that will results to improved incomes
- b) Working with key stakeholders such as CIP, demonstrate the new apical stem cutting aeroponics and hydroponics technologies, for seed potato production to farmers to improve efficiency of seed
- c) Research and evaluate seed potato variety suitable for other agro-ecological zones in Bungoma areas and for marketability

Objective 3: Improve production capacity of high-quality seed potato to farmers

Specific interventions

- a) Capacity build farmers to produce quality and clean seed for their own use to reduce disease and pests spread
- b) Promote mechanization for seed production e.g. ridgers, planters and harvesters
- c) Collective purchase of seed potato to reduce costs.
- d) Support and adopt use of SMs based directory by farmers for seed potato information dissemination

4.3. Strategic issue 2: Low ware potato production

Objective 1: To increase productivity of ware potatoes

Specific proposed interventions

- Improve the research, extension and farmer education information network to encourage adoption of new technologies.
- Capacity builds TOTs and extension service providers on on-farm seed quality maintenance (Positive Selection, small seed plot technique, etc.); to disseminate the same and support farmers to produce quality seed at farm level to improve yields and quality of ware potato
- Distribute customized farmers training manuals and leaflets on basic production tips such as soil sampling and testing, spacing, fertilizer rates and types(after soil analysis), weeding time, diseases and pests control, hilling and dehauling, harvesting at full maturity to reduce post-harvest losses and reach full yield potential etc. Also farmers training on on-farm sanitation, rotation and GAP.
- Provision of subsidy for Soil sampling and testing to potato farmers
- Include potato in County subsidized fertilizer provision scheme based on soil analysis results

Objective 2: Mechanization and use of irrigation in potato production

To use farm machineries and irrigation systems

Specific proposed interventions

- Support both public and private investment in farm machinery for cultivation, planting and harvesting to cater for the demand of services
- Support public awareness on potato production using farm machinery through field demonstrations to increase uptake of mechanized technologies.
- Work with financiers in tailor making of financial products to support the farmers to finance mechanization
- Support Construction and rehabilitation of dams and water-pans for water harvesting and train farmers on proper management of the same

4.4. Strategic issue 3; Limited market access, Low investment in value addition and poor consumption.**Objective 1: Improve potato marketing for increased farmers' income****Specific proposed Interventions**

- Organize smallholder farmers for markets through group approach for capacity building and obtain economies of scale in production and collective marketing
- Boost production of market-preferred potato varieties, promote aggregation, and investment in collection centers
- Profile market outlets to absorb potato volumes produced and establish a functional marketing platform to articulate challenges of marketing in the county
- Create and promote direct market linkages between the farmers and market outlets e.g. through contract farming
- Improve the quality of ware potato via promotion of proper potato packaging bag and labelling to enhance branding and traceability
- Invest in off-season ware potato production to address the challenge of glut, and price

- Establishment of potato cold storage systems to address the challenge of glut, and price fluctuations facilities in the counties by farmer groups and/or the County government.

Objective 2: To improve ware potato value addition

Lack of access to improved potato seed, application of poor agronomic and postharvest practices affected the quality and productivity of ware potato produced by households which in turn became a huge barrier for creating sustainable market linkage to earn adequate income from the production.

Specific proposed interventions

- Promote adoption of marketing technologies to facilitate exchange/sharing of marketing information e.g. Viazzi soko platform, E-Soko etc
- Provide supporting services, incentives and infrastructure for value addition.

Objective 3: To promote consumption and Increase nutrition uptake

Specific proposed interventions

- Sensitization and capacity building of target groups on nutritive and health benefits of the potatoes
- Development of healthy recipes of potato products
- Sensitization on the use of the potato in complementary feeding for children 6- 23 months
- Training and demonstrations on different potato recipes
- Sensitize on post-harvest handling of the potato to prolong the shelf life
- Sensitization on good hygienic practices of the during processing and preparation

4.5. Strategic issue 4: Weak/Lack of Potato Policy in the County and legal framework

Objective 5: To enhance formulation/harmonization, implementation and enforcement of relevant policies and other legal documents.

Specific proposed interventions.

- Bungoma County to Develop its own policy from the national government
- Train farmers and stakeholders on their role in policy development and implementation by holding public-policy engagement workshop
- Strengthen the stakeholders and partners linkages through Bungoma potato platform
- Support review of the County fiscal policy to support the potato production and marketing regulations of maximum 50 kg and pricing by weight
- Enact, enforce and implement at County level policies and regulations that facilitate improvement of potato production and marketing
- Formalize cross border trade and inter-county trade Promotion and harmonize the regulations to support the trade eg. MoUs/agreements

4.6. Strategic issue 5: Weak Coordination, partnership and low funding

Strategic Objective 1. To Increase funding and partnerships

Specific proposed intervention

- Design the potato value chain activities work plan for Bungoma Potato Value chain development
- Involve stakeholders in budget making processes

Objective 2: To enhance sector Coordination and Collaboration *Bureau of County Potato Strategy*

Specific proposed interventions

- Create a potato platform of representatives of stakeholders to harmonize operations within the value chain in the county.
- Develop and implement a Planning Monitoring and Evaluation Framework and knowledge management portal

CHAPTER 5

5.0. Implementation matrix

Table 5: Implementation

| Interventions | Activities | Output | Budget | Timeline | Responsible |
|---|---|--|-----------|------------------------|-------------|
| Strategic issue 1: Inadequate seed potato production and poor distribution system | | | | | |
| Objective 1: Investment in seed production and distribution within the county to increase accessibility and affordability to quality seed by farmers | | | | | |
| Designate and deliberate allocation of available public land for seed potato production by the County government of Bungoma | Identify suitable public land e.g. Mabanga, Sang'alo, Mt Elgon forest land etc. to be done by the county department of agriculture. | Land identified -opinion leaders + public participation meeting Fare=1500x30=4500 | 45,000 | By July 2019 | |
| Provide policy for private public Partnership (PPP) in seed potato production investment | Organize private investors' forum for potato value chain | Number of fora organized 4quarterlyx30x1500=180,000 | 180,000 | 2018/19 financial year | |
| Support construction of diffuse light stores for seed storage | Design and construct the diffuse storage facilities. | Number of stores designed and constructed=10(1 per ward) 500,000x10 | 5,000,000 | 2018/19 | |
| Objective 2: Participatory demonstration trials of new varieties and seed potato production technologies | | | | | |
| Set up demonstration trials at sub-county levels for KEPHIS registered varieties with good processing qualities | Identification of farmer/farmer groups for demonstration trials. | No. of farmers/farmer groups identified for trials in sub counties. 3gps per ward =3x22=66 Target acres=9x60,000 | 540,000 | 2018/2019 FY | |
| | Identification of the source of the new seed varieties. | Source of new seed varieties identified for trials. | 700,000 | | |

| | | | | | |
|---|---|--|----------------------|---|--|
| | Capacity building of farmers on the new varieties | No. of farmers capacity built in sub counties. 30000x18 | 540,000 | | |
| Demonstrate the new apical stem cutting, | Capacities build target farmers on apical stem cutting. | No. of farmers trained on apical stem cutting. 6gpsx20=120 30000x6gps=180,000 cost of materials=400x20x6 No. of structures constructed | 180,000 48000 | 3 rd and 4 th Q of 2018/19 FY | |
| | Design and construct structures for aeroponics and hydroponics | | | | |
| Research and evaluate seed potato variety suitable for other agro-ecological zones in Bungoma areas and for marketability | KARLO, CIP and other research institutions to identify sites for on farm participatory research | No. of varieties researched on and evaluated 3 sitesx200,000 | 600,000 | 2019/2020 | |
| Objective 3: Improvement of production capacity of high-quality seed potato to farmers | | | | | |
| Capacity builds farmers to produce quality declared and clean seed for their own use to reduce disease and pests spread | - CIP, KARLO, research institutions and other partners to train ToTs on high quality seed production. | No. of TOTs trained. 40TOTx6000x4days | 2,400,000 | 4th quarter of 2018/19 | |
| | ToTs to train farmers on high quality seed production. | No. of Farmers trained 60000x22gps | 1,320,000 | | |

| | | | | | |
|--|---|---|------------|--------------------------|--|
| Support and adopt use of SMS based directory by farmers for seed potato information dissemination | The county department of agriculture to generate seed potato producers and farmers register for bulk sms services and WhatsApp. | Farmers and seed potato producers registered 10daysx 2000x22wards= | 440,000 | 4th quarter of 2019/2020 | |
| | The county ICT team to operationalize the system. | SMS platform operationalized | 500,000 | | |
| Strategic issue 2: Low ware potato production | | | | | |
| Objective 1: To increase production and productivity of ware potatoes | | | | | |
| Improve the research, extension and farmer education information network to encourage adoption of new technologies | Establish on farm research demonstration trials on potato production technologies | 2 demos per ward per year total 44 in 22 wards 44x100,000x4yrs | 17,600,000 | 2018-2022 | |
| | -Establish farmer field schools | -60 FFS for 5 years in 22 wards by FEO and 250 being facilitated by lead farmers 108 Learning farms 60x60,000=3,600,000 250 x 30,000=7,500,000 108x 40,000= 4,320,000 | 15,420,000 | 2018-2022 | |
| | Organize mass communication through local media and use mobile services | -Engage 2 local radio stations and 2 TV stations in potato promotion and develop soft ware's for SMS | 300,000 | 2018-2022 | |

| | | | | | |
|--|---|---|------------|-----------|--|
| | Organize farmers into groups for faster dissemination of new technologies | 158 potato groups formed | 3,160,000 | | |
| | -Exchange visits and tours | 10 tours in 5 years @ 300,000 | 3,000,000 | | |
| | -Organizing Field days, Agricultural shows, exhibitions and trade fairs | 15 field days per year total 75 field days in 5 years 75x30,000 | 2,250,000 | | |
| | | | | | |
| Capacity building TOTs and extension service providers on on-farm seed quality maintenance | Capacity building TOT and extension providers trainings | 10 TOTs trainings and 5 extension providers 15x10,000x 8trainings | 1,200,000 | 2018-2022 | |
| Customized and distribute farmers training manuals and leaflets on basic production tips | Development of training manuals, fliers and brochures | 1200 manuals, 10000 brochures and fliers <ul style="list-style-type: none"> • 1200manualsx200/= • 1000brochuresx50 | 290,000 | 2019-2020 | |
| Objective 2: Improve mechanization and use of irrigation in potato production | | | | | |
| Public and private investments of farm machinery for potato farming | Purchase of potato machineries and implements for hire to farmers at subsidized cost. | 3 potato tractor, planters and harvester purchased by county <ul style="list-style-type: none"> • 3x6m | 18,000,000 | 2019-2022 | |
| Public awareness on potato production using farm machinery through field days | Demonstrations of use of potato farm machineries by private investors | 10 demonstrations of mechanized farming and use of machineries <ul style="list-style-type: none"> • 10x100,000 | 1,000,000 | 2019-2022 | |

| | | | | | |
|--|--|--|------------|-----------|--|
| Tailor-make finance product with financier to support farmer's in financing mechanization and potato production | Organize meetings forum with extension service providers Financiers farmers and marketing agents/processors | 5 sensitization meetings between extension providers, financiers, farmers and traders 5x30x1500 | 225,000 | 2018-2021 | |
| | Financial management training to farmers by Financiers | 10 financial management trainings by Financiers 10x30x1500 | 450,000 | 2018-2022 | |
| Support Construction and rehabilitation of dams and water-pans for water harvesting and train farmers on proper management | Purchase of pipes and fittings irrigation equipments including solar pumps, runoff water harvesting, roof water harvesting, survey | Assorted irrigation equipments (1sets per ward) total 22 sets 22x500,000 | 11,000,000 | 2018-2022 | |
| | Design of irrigation systems | 10 irrigation systems designed for potato production 22x50,000 | 1,100,000 | 2018-2022 | |

Strategic issue 3; Limited market access, Low investment in value addition and poor consumption.

Objective 1: To improve potato marketing for increased farmers' income

| | | | | | |
|--|--|--|---------|-----------|--|
| Organize smallholder farmers for markets through group approach for capacity building and obtain economies of scale in production and collective marketing | Organize farmers into commercial producer groups | Aggregation of potatoes for access to better prices, reduce marketing cost, improve bargaining power, increased income. 7s/cx30,000 | 210,000 | 2017-2018 | |
| | Capacity building of the groups | Organized marketing 7s/cx20,000 | 140,000 | | |

Bungoma County Potato Strategy

2018-2022

| | | | | | |
|---|---|---|-----------|-----------|--|
| | Registration of the groups | Price Stability 7x10,000 | 70,000 | | |
| | Linking groups to other service providers eg. financial institutions, market information agency | Improved skills on marketing and group dynamics 7x20,000 | 100,000 | | |
| | Creation of producer SACCOS | Improved accessibility to service providers 7x30,000 | 210,000 | | |
| | Develop an Organizational development manual for the farmer groups. | Improve credit accessibility 7x40,000 | 200,000 | | |
| Boost production of market-preferred potato varieties, promote aggregation, and investment in collection centers | Seed bulking of the preferred varieties | Increased availability of preferred seed varieties for the market 7x200,000 | 1,400,000 | 2018-2019 | |
| | Contracting of farmers to produce specific varieties for specific markets | Increased production of preferred varieties | 900,000 | | |
| | Construction of collection centers and Establishment of cooling facilities. | Availability of collection centers with cooling facilities 2 collection centres x1,000,000 | 2000000 | | |
| Profile market outlets to absorb potato volumes produced and establish a functional marketing platform to articulate challenges | Baseline Market Survey | Active marketing platforms 10x2000x3dys | 60,000 | 2018 | |

Bungoma County Potato Strategy

2018-2022

| | | | | | |
|---|---|--|-----------|-----------|--|
| of marketing in the county | Establish functional marketing platform | Successful articulation of marketing issues 30x1500x2dys | 90,000 | 2018 | |
| | Organize meetings for all players in the marketing segment | Challenges, weaknesses addressed, strengths and opportunities harnessed 5x30x1500 | 225,000 | 2018 | |
| | Carry out a SWOT analysis of potato marketing in the county | | 60,000 | 2018 | |
| Create and promote direct market linkages between the farmers and market outlets e.g. through contract farming | Create market platforms | Farmers engaged in contract farming 5s/c x30,000 | 150,000 | 2018-2020 | |
| | Design MoU for contract farming | Direct market linkages supported and implemented 5 x 30,000 | 150,000 | 2018-2020 | |
| Improve the quality of ware potato via promotion of proper potato packaging bag and labeling to enhance branding and traceability | Training farmers on standard post harvest management practices including, GAP, grading, and other marketing skills. | Improved skills in GAP, grading, and other marketing skills 5 x 30,000 | 150,000 | 2019 | |
| Training farmers on group dynamics to facilitate aggregation of inputs | Farmer group trainings on group dynamics | 200 trainings (2groups per training) 158gpsx10.000 | 1,580,000 | 2018-2022 | |

Bungoma County Potato Strategy

2018-2022

| | | | | | |
|---|---|--|-------------|-----------|--|
| Promote adoption of marketing technologies to facilitate exchange/sharing of marketing information e.g. Viazi soko platform, E-Soko | Sensitization on available marketing technologies for adoption | Increased adoption of marketing technologies. | 100,000 | 2020 | |
| Mapping out of marketing outlets in Bungoma, Kisumu main markets | Registration of market outlets | Increased markets 4 market surveys x100,000 | 400,000 | 2019 | |
| | Organize for exchange visits for information sharing. | 10 visitsx5s/c x2x1500 | 150,000 | 2018-2022 | |
| Establishment of ware potato cold storage systems to address the challenge of glut, and price fluctuations facilities in the counties by farmer groups and/or the county government | Identification and approval of site for cold storage structures | land available for construction of storage facilities | 60,000 | 2020-2022 | |
| | | Public participation barazas 10wards | 300,000 | | |
| | | Community leaders meeting At 4sites | 120,000 | | |
| | Procure and construct cold storage facilities | ware potato stored in the cold room for future marketing 2 cold storage | 100,000,000 | 2020-2022 | |

| | | | | | |
|--|---|---|-----------|-----------|---------------------|
| Invest in off-season ware potato production to address the challenge of glut, and price fluctuations | carry out a feasibility study in potential areas for irrigation farming in potato production. | Feasible potential areas for potato irrigation identified. 4visits x 5s/c x1500x4officers | 120,000 | 2020-2022 | |
| | Sensitization and introduction of irrigation technology in potato production. | Technologies in potato irrigation adopted by farmers 4gps x5s/c x 10,000 | 200,000 | 2019-2021 | |
| | Sourcing of funds and purchase of irrigation equipment | Funds | 3,000,000 | 2019-2022 | |
| | Irrigation equipment installation | Increase in off season potato production Potato availability and price fluctuation minimized | 1,500,000 | 2019-2022 | |
| Objective 2: To improve ware potato value addition | | | | | |
| Provide supporting services, incentives and infrastructure for value addition to attract the youth in agro-processing and also increases farmer margins. | Capacity building on value addition/agro processing business. | Value added products available | 500,000 | 2020 | |
| | Form youth groups for agro processing. | Youth involvement in agro processing. | 1,000,000 | 2020 | |
| | Provide subsidy on equipment for value addition | Increase accessibility of agro processing equipment | 2,000,000 | 2020 | National government |
| Improve the quality of ware potato via promotion of proper potato packaging bag and labelling to enhance branding and traceability | Registration of products through KEBS | -Improved income -Availability of high quality and branded products in market | 50,000 | 2019-2020 | |

| | | | | | |
|---|--|---|---------|--------------|---------|
| | | | 120,000 | 2019 | |
| Objective 3: To improve ware potato utilization and nutrition uptake | | | | | |
| Educate consumers on the nutritional value of potatoes to improve local consumption of potatoes | Promotion of consumption of the potato | Behavior change communication on the potato as a food crop. | 770,000 | (2018-2022) | MOA |
| Sensitization and capacity building on nutritive and health benefits of the potatoes | | Knowledge on the nutritive and health benefits of the potato | | (2018- 2022) | MOA/MOH |
| Development of healthy recipes of potato products | Conduct 3 technical team meeting for recipe development Validate the recipe | Various recipes of the potato and its products adopted 3 workshops 30x 3000 | 270,000 | (2018- 2022) | MOA |
| Sensitization on the use of the potato in complementary feeding for children 6- 23 months | Carry out sensitization workshop for mothers | Reduction in the stunting levels in Bungoma county 22 sensitization meetings x10,000 | 220,000 | (2018- 2022) | MOA/MOH |
| Sensitize the communities on healthy diets | Training and demonstrations on different potato recipes | <ul style="list-style-type: none"> • Increased consumption and income at the households • Healthy community 154x 5000 demos conducted | 770,000 | (2018- 2022) | MOA |

| | | | | | |
|--|--|---|-----------|--------------|---------|
| Sensitize on post-harvest handling of the potato to prolong the shelf life | 2 workshop | Reduction in post-harvest losses | 300,000 | (2018- 2022) | MOA |
| Sensitization on good hygienic practices of the during processing and preparation | Carry of 3 days campaign | Reduction in infections and food poisoning | 450,000 | (2018- 2022) | MOA/MOH |
| Strategic issue 4: Weak/Lack of Potato Policy in the County and legal framework | | | | | |
| Objective 1: To enhance stakeholders involvement in policy formulation/harmonization, implementation and enforcement of policies and other legal documents that support development of potato value chain | | | | | |
| Capacity building of stakeholders, staff and farmers on policy issues | Mobilization and sensitization of farmers and stakeholders on policy issues on potato value chain, policy making process | Farmers and stakeholders mobilized and sensitized 5x50,000 | 250,000 | 2018-2019 | |
| | Train staff and stakeholders on policy formulation | Staff and stakeholders trained on policy formulation 100x8000x2dys | 1,600,000 | 2019 | |
| | Review of the current regulatory and policy environment of potato value chain | Existing policies reviewed 30x2x2000 | 120,000 | 2018-2019 | |
| | Organize consultative workshop on potato fiscal policy making | Consultative workshop held 40x10,000x3 | 1,200,000 | 2019-2021 | |

| | | | | | |
|--|--|---|-----------|-------------------|---------------------------------|
| Develop county policies and regulations to improve potato production and marketing | Organize stakeholder sensitization workshops | Stakeholder holder sensitization workshops organized 40x10,000x3x2 | 2,400,000 | 2019-2020 | |
| | Organize public awareness campaigns on development of potato polices and regulations | public awareness campaigns organized 4x5x10,000x2 | 400,000 | 2018-2020 | |
| | Formation of task force to develop policies and regulations | Task force formed 30x2000 | 60,000 | 2018-2021 | |
| Objective 2 : Increase financial investment in potato value chains | | | | | |
| Sensitize and involve stakeholders on budget making process | Forum to involve farmers and key stakeholders in County budget making | 2 forums per year 40x2000x2 | 160,000 | 2019-2020 | |
| Encourage private investment, | Proposal writing and Public-private partnership mechanism | | 100,000 | | |
| Strategic issue 5: Weak Coordination, partnership and low funding | | | | | |
| Objective 1: To enhance sector Coordination and collaboration | | | | | |
| Establish stakeholders platform | Develop a customized MoU partnership with stakeholder | MoU developed | 150,000 | 2018-2019 June | |
| | Conduct annual stakeholders partnership forum | Partnership created | 1,000,000 | 2018-2022 | County Agriculture office |
| Total Budget | | | | | |

CHAPTER 6

6.0. Monitoring and evaluation

The purpose for Monitoring and Evaluation (M&E) is to ensure that the Strategic Plan implementation is according to schedule and if there is any deviation, appropriate and timely action is taken. Monitoring and Evaluation will be based on the performance indicators specified in the action plan. The M&E process will be undertaken by the department of Agriculture and irrigation.

Monitoring and control systems will include review meetings and progress reports from the partners and collaborators.

The nature and scope of reporting will include:

- Progress made against Plan.
- Causes of deviation from the plan if any.
- Challenges and proposed solutions to issues that adversely affect implementation
- Corrective measures

The control mechanisms will include the following:

- Action plans
- Performance targets
- Management reports
- Budgets
- Implementation Program matrix
- Performance indicators/output