



# NYANDARUA COUNTY POTATO STRATEGY



Five Year Master Plan (2017-2021)

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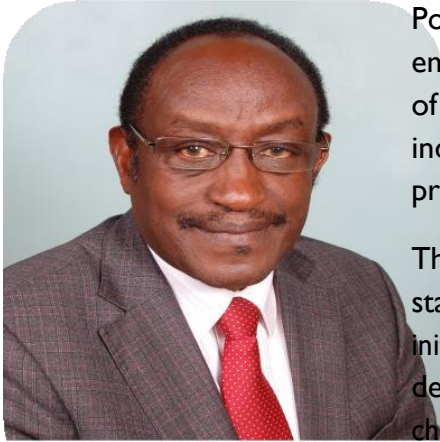
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**List of Acronyms**

AFA	Agriculture and Food Authority
AGRA	African Green Revolution in Agriculture
AMS	Agriculture Mechanization Services
ATC	Agriculture Training Centre
ASDSP	Agriculture Sector Development Support Programme
CBO	Community Based Organization
CIP	International Potato Center
CPS	County Potato Strategy
CV	Commercial Village
DLS	Diffuse Light Store
GAP	Good Agronomic Practices
GIZ	Germany International Development Agency (Deutsche Gesellschaft für Internationale Zusammenarbeit)
IFDC	International Fertilizer Development Centre IPM- Integrated Pest Management
KAPAP	Kenya Agriculture Productivity and Agribusiness Project
KALRO	Kenya Agriculture and Livestock Research Organization
KENAFF	Kenya National Farmers Federation
KEPHIS	Kenya Plant Health Inspectorate Services
KIBT	Kenya Institute of Business Training
KIRDI	Kenya Industrial Research Training Development Institute
MOALF	Ministry Of Agriculture, Livestock and Fisheries
NPCK	National Potato Council of Kenya NYS- National Youth Service
NYS	National Youth Service

RBM	Result Based Management
SACCO	Savings and Credit Cooperative Society
SNV	Norwegian Development Agency
SDA	State Department of Agriculture
TOT	Training of Trainers

**Foreword**

HIS EXCELLENCY HON. DANIEL WAIHAKA MWANGI  
GOVERNOR OF NYANDARUA COUNTY

Potato is an important crop in Nyandarua County for food security, employment and income generation. Nyandarua County contributes 33% of ware potatoes produced in Kenya. The potato value chain directly and indirectly supports 131,697 farm families in the County. The potatoes produced in the County have a net worth over Ksh 7.0 billion.

The Nyandarua 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. This will create synergy in tackling challenges in potato value chains for the benefits of all value chain players.

The strategy has an overarching goal of increasing potato yields in the county by at least 40% and income of potato farmers by at least 20% by December 2021 through participatory evaluation of potato breeding lines, variety demonstrations, improvement of production, 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 potato strategy will guide various stakeholders' initiatives to ensure there is no duplication of activities by various stakeholders and development partners. This will lead to proper utilization of resources by all in the implementation of activities and interventions in the 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 endeavor. Let me take this opportunity to welcome private sector investors to invest in potato value chain in the County.

It is also my hope that this strategy will harmonize the initiatives of various actors and players in potato value chain

H.E DANIEL WAIHAKA MWANGI  
GOVERNOR  
NYANDARUA COUNTY

**Acknowledgement**

Potato is a key enterprise in the County and contributes enormously to food security, income generation and employment in the county. The Nyandarua County Potato Strategy (Nyandarua CPS) is crucial in guiding the development of the potato value chain in the County. It has been developed by the County Government working closely with farmers, potato stakeholders and development partners. The Strategy is aligned with the National Potato strategy and vision 2030.

Special thanks to the Governor Hon Waithaika Mwangi, the Deputy Governor Hon Mwangi Kirika, the Senator, Hon Muriuki Karue, the Woman Representative, Hon Wanjiku Muhia and the other members of Parliament for their tremendous efforts they made towards the success of the strategy.

I am thankful for the role played by Honorable members of the county Assembly led by the Speaker Hon. Ndegwa Wahome and the chairman Agriculture, Livestock and Fisheries Committee Hon. Kimani Njiraini.

Special thanks go to the Officer staff Ministry of Agriculture, Livestock and Fisheries led by the Chief officer Dr. Gikaara, County Director of Agriculture Margret Kambo , potato value chain officer Joseph K. Mutuma and S.K. Kariuki of ATC Njabini for their roles in Coordination of the consultative process and writing of this document.

The role of the various stakeholders from civil society, potato producer groups, processors, Non-Governmental organizations, Community based organizations, Development partners and private sector in potato value chain is highly appreciated. I extend my appreciation to Elly Ouma of International Potato Center for editing the document. Special thanks also go to Mr. Wachira Kaguongo of National potato Council of Kenya, Dr. Elmar Schulte-Geldermann of International potato center and Dr Joseph Maina of the State Department of Agriculture for their roles in stakeholder forums and working teams involved in development of this potato strategy.

Finally, let me express my gratitude to institutions and programmes working in Nyandarua County that have continuously supported activities in the potato value chain. In this regard, we want to thank CIP, SNV, GIZ, NPCK, ASDSP and KAPAP.

It is my sincere hope that this Potato Strategy will guide the stakeholders in addressing the challenges facing the value chain in the County.

**HON. AGATHA W. THUO**  
**COUNTY EXECUTIVE MEMBER**  
**MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES**  
**NYANDARUA COUNTY**



## I.0 Introduction

### I.1 Background



Figure 1 : key partners in governor's office

Nyandarua County contributes about 33% of the total potato produced in Kenya. However, the crop, which is second to dairy in the county, is faced with a myriad of challenges along its value chain which have led to low average yields of about 8 to 10 Tonnes/ Ha which is way below the achievable levels of 20-40 Tonnes/Ha. The following are the main challenges:

- Minimally functional seed potato systems, which limit **the supply of high-quality seed potato**
- Poor production practices for both seed and ware potato
- Pest and diseases
- Declining availability of labour coupled with Low levels of mechanization
- Inadequate infrastructure development with poor or lack of grading sheds, collection centres, rural access roads, markets and storage facilities
- Inadequate policy and low levels of implementation of rules and regulations in the value chain especially those that deal with production and marketing.

To address these challenges the three key stakeholders: Nyandarua County, National Potato Council of Kenya (NPCK) and International Potato Center (CIP) created a partnership to develop Nyandarua County Potato Strategy (Nyandarua CPS). The Strategy is aimed at guiding the development partners and stakeholders in aligning development initiatives and interventions in order to achieve accelerated growth and development of the industry. This will create synergy in tackling of these challenges for the benefit of all actors in the value chains including smallholder farmers who form the majority of potato producers in the County.

A stakeholder workshop was held in Nyahururu, Nyandarua County where 97 stakeholders from the private and public sector and development partners were brought together to articulate the value chain issues and map out the development strategy. The workshop was jointly funded by the County Government and CIP while NPCK provided organizational leadership and linkages. All contributions were documented and a taskforce was formed to effect the contributions of the stakeholders and finalize on the strategy.

The County Potato Strategy has overarching goal of increasing potato yields in Nyandarua by at least 40% and increase incomes of potato farmers by at least 20% by December 2021 through the following key objectives: (1) Participatory evaluation of breeding lines and variety demonstrations (2) Improvement of production capacity of high-quality seed potato, (3) Increased productivity through improved farming practices. (4) Mechanization and use of irrigation in potato production. (5) Improved pre- and post- harvest management and market access by linking value chain players. (6) Support, implement and enforce policy and regulations that enhance development of potato value chain.

Map of Nyandarua County showing administrative wards (replace with an updated map)



Figure 2: Map of Nyandarua County

## **I.2 Role played by Key Stakeholders**

### **Nyandarua County Government**

The County being the main beneficiary through development and growth of the potato value chain and increased incomes to the farmers and other value chain actors will provide necessary political, institutional and financial support. The County will work with key stakeholders and development partners to develop and implement Nyandarua CPS. The County Government, working with development partners, will endeavor to provide necessary facilities, infrastructure and policy environment for the implementation of Nyandarua CPS. The County Government will also work with NPCK and other relevant stakeholders to influence and/ or facilitate formulation and implementation of supportive national policy and regulations for development of potato value chain.

### **NPCK**

NPCK will provide coordination, linkages between stakeholders, planning and identifying interventions for development of potato value chain. It will also provide entry point for stakeholders and development partners by providing requisite information and linkages in dissemination of innovations, technologies, extension and training. The NPCK will also support and inform implementation of potato policy, regulation and standards.

### **CIP**

The International Potato Center (CIP) under the result based management (RBM) potato flagship is supporting the development and implementation of the potato strategy in close collaboration with, NPCK, County authorities and other stakeholders.

## 2.0. Development of Nyandarua County Potato Strategy

Development of Nyandarua CPS followed the five steps below:

1. Consultative meeting between the four key partners
2. Development of thematic areas of the strategy
3. Potato Value chain Stakeholders' meeting
4. Taskforce formation and mandate
5. Launch of the strategy

### 2.1 Consultative meeting between the three Key stakeholders

A consultative meeting between MoALF of Nyandarua County, CIP, GIZ and NPCK was held in Olkalou, Nyandarua County, to discuss how the potato value chain in Nyandarua County could be developed. It was agreed that the four institutions would work in partnership to develop potato strategy that would help achieve specific goal of improving incomes of the potato farmers in the county. The initiatives would involve other players and actors from the county and relevant stakeholders from outside the county. The Strategy would provide road map for value chain growth and would indicate the role of each stakeholder in the development. The key partners were tasked with the responsibility of developing the zero draft and framework of the strategy which would be discussed during the stakeholders' meeting, organizing for the stakeholders meeting and overseeing the implementation of the strategy.

### 2.2 Development of thematic areas of the strategy

The five thematic areas were developed during a Potato **Round table meeting** held in Nyandura County. Strategic objectives were developed for each thematic area and several interventions formulated for each objective. The following are thematic areas and strategic objectives identified:

1. Seed system and variety development
  - a. Participatory evaluation of breeding lines and demonstration of new varieties
  - b. Improvement of production capacity of high-quality seed potato
6. Ware potato production
  - a. Increase productivity through improved farming practices
  - b. Mechanization and use of irrigation in potato production
7. Potato marketing and processing
  - a. Improve pre- and postharvest management and market access by linking value chain players
8. Policy, legal and regulatory framework
  - a. Support, implement and enforce policies and regulations that enhance development of potato value chain
5. Coordination and collaboration

This thematic area was added to ensure implementation of the strategy is achieved.

## 2.3 Stakeholders workshop

A stakeholder workshop was held with the following objectives:

- i. To identify all the potato stakeholders in Nyandarua County whose support, input and participation would be required for successful implementation of the Nyandarua CPS.
- ii. To introduce the draft of Nyandarua CPS to the relevant stakeholders to ensure that they fully understand its goals and objectives.
- iii. To obtain input and buy-in/commitment from stakeholders for successful implementation and in order to achieve the overarching goal of the strategy by December 2021.
- iv. To bring together the main potato value chain stakeholders from all over the Country to start interacting and networking.
- v. To form a taskforce that would finalize Nyandarua CPS and come up with the implementation plan as well as spearhead implementation of the strategy.

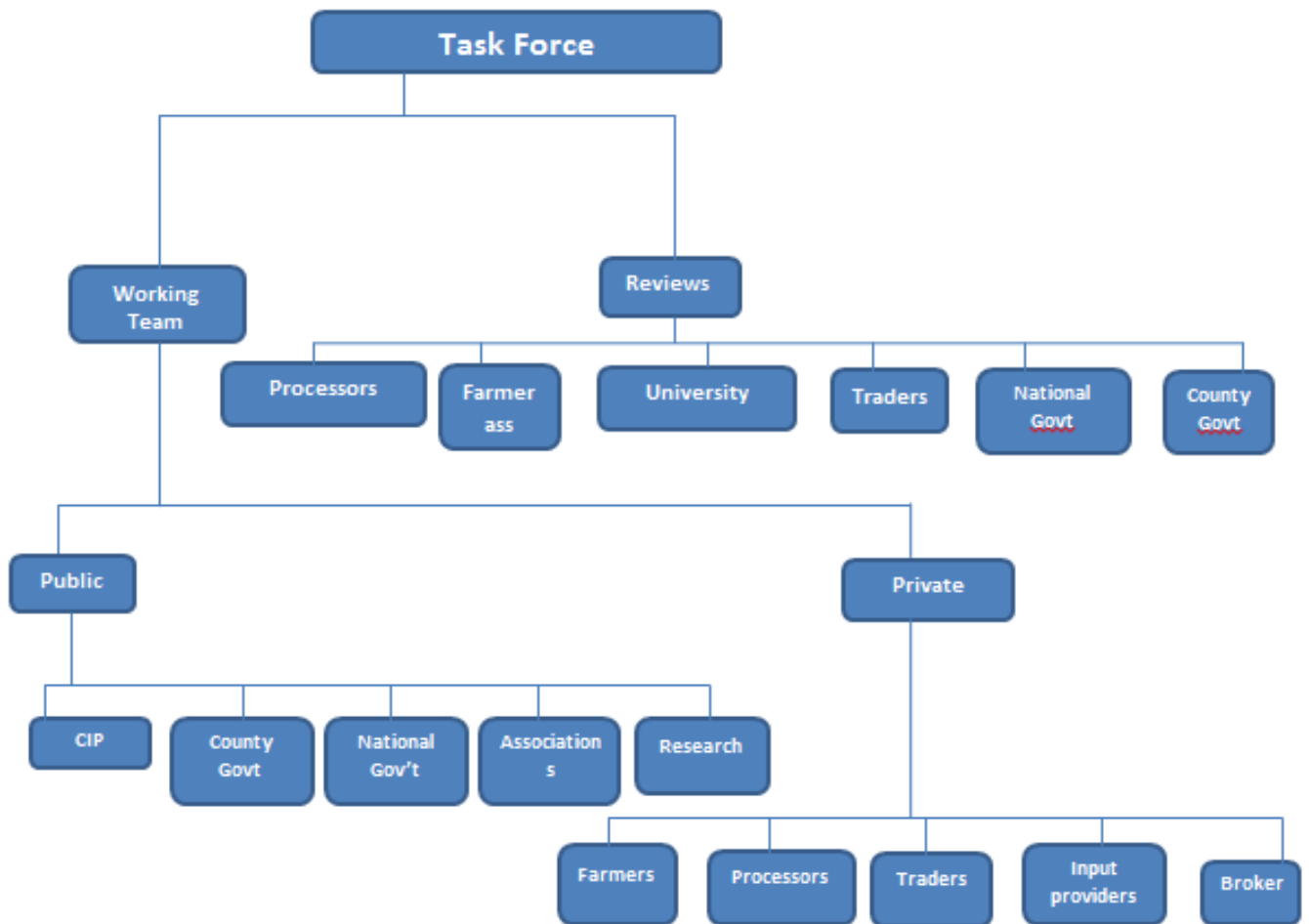
### 2.3.1 Participants of the workshop

The workshop brought together different stakeholders who represented actors and players along the potato value chain. Participants included Ware potato farmers, Seed potato producers, Traders, Processors, Development partners, extensionists, Academia, Researchers, Financial institutions, Input and service providers and NGOs as listed in **Annex I**. During the meeting the overall goal and objectives of the strategy were discussed and agreed while realistic and achievable action plans were developed and interventions identified.

## 2.4 Taskforce formation and mandate

A taskforce was formed comprising representatives of various stakeholders in the potato value chain and tasked with finalizing the County Potato strategy. The taskforce is divided into two teams; the working team and the review team. The working team was tasked with going through the proposed draft and adding input, incorporating feedback from the stakeholders workshop and coming up with a draft which would be passed on to the review team for final review.

Below is the structure and composition of the Taskforce (working team and Review team) in terms of representation of the different stakeholders in the Nyandarua County potato value chain.



**Figure 3: Composition of a taskforce**

### 2.4.1 Roles and composition of the taskforces

The role of the Taskforce was defined as: 1) To capture inputs and changes proposed to the Nyandarua County potato draft strategy during the stakeholders' workshop,

2) To rationalize all specific inputs and translate all proposed interventions into SMART (Sensible, measurable, accurate, realistic and time bound) action plans; and

3) Develop a final strategy which includes timelines and expected outputs.

The working team was mandated to carry out the task of assimilating and concretizing the proposed draft together with stakeholders input (from workshop) developing a near final draft. The Review Team's role was defined as that of reading through the draft document presented by the working team to ensure its accuracy and completeness and in terms of technical content and scope. Taskforce members were elected by the delegates present in the stakeholders meeting through nomination and confirmed through acclamation.

## **2.4.2 Terms of reference of the taskforce**

The main function of the working team is to develop the draft strategy through the structured process agreed.

The main function of the review team is to review the draft and provide their inputs and comments for consideration by the core partners.

Details of the full terms of references for the working and review teams was agreed by the core partners and communicated to the members.

## 3.0 Nyandarua County Potato Value chain Strategy

### 3.1 Strategic Goal

The strategy has the overarching goal to increase potato yields in Nyandarua by at least 40% and increase incomes of potato farmers by at least 20% by December 2021.

### 3.2 Objectives

The strategic goal will be achieved through the following objectives and interventions:

#### 3.2.1 Objective 1: Participatory evaluation of breeding lines and demonstration of new varieties

##### 3.2.1.1 Situation and challenge:

Shangi is the dominant variety because of its early maturity and short dormancy. Farmers are able to grow potatoes 3 times a year and practice staggered planting and harvesting throughout the year. *Other varieties also grown by farmers include Asante, Kenya Mpya, sherekea, Kenya Karibu, Dutch robjyn etc.* To widen the diversity and provide different options for variety choice, the strategy will consider a participatory evaluation of new breeding lines and newly registered varieties.

##### 3.2.1.2 Specific project interventions

- The County Agricultural office, GIZ, CIP and other stakeholders would set up demonstration trials for newly registered varieties with good processing qualities (Chips, Crisps) and therefore offer farmers new market opportunities and create employment; **County Agricultural office, GIZ, CIP.**
- CIP in partnership with KALRO will set up some demonstration trials with advanced breeding lines with the purpose of identification of promising farmers and market demanded varieties; **County Agricultural office, KALRO, GIZ, CIP.**
- Continuous evaluation and trials of released varieties; County Agricultural office, **SNV, IFDC/ AGRICO/MURPHIS, SYNGENTA, NPCK, FARMERS, Agrochemical companies BAYER CROP SCIENCE.**
- Due to the effect of climatic change, the yields have been reducing hence need for varieties adapted to these changes. Varieties with some level of drought tolerance will be tested; **County Agricultural office, KALRO, CIP.**

#### 3.2.2 Objective 2: Improvement of production capacity of high-quality seed potato

##### 3.2.2.1 Situation and challenge:

Limited amounts of high-quality, early generation seed remain a serious bottleneck in the seed supply chain. Current seed production satisfies very little of the demand in Nyandarua. ATC Njabini and some out growers are the only seed Multipliers of the preferred variety, Shangi, which, only recently, has been cleaned by KALRO–Tigoni and provides the basic material to ATC Njabini.



However, the amount of clean seed for Shangi (150 tonnes) produced from ATC Njabini per year is too low compared to the demand. There are some seed of newly released varieties that are being multiplied by Suera Farms Ltd in the County.

### 3.2.2.2 Specific proposed interventions

- Facilitate existing specialized seed multipliers (private and public sector) to increase production of quality seed; **County Agricultural Office, NYS, ATC's and others supported by NPCK and KALRO, farmer groups and cooperatives, private investors**
- Identify and build technical capacity of new specialized private seed producers by; **County Agricultural Office NPCK, KALRO, ADC, KEPHIS, ASDSP, KEPHIS, SNV, CIP**
- Identify and develop technical and entrepreneurial capacity of decentralized seed potato producers (individuals, groups, cooperatives) and link them to specialized public and private seed producers; **County Agricultural Office, ASDSP, SNV, NPCK, KEPHIS, KALRO and CIP**
- Support business model development for seed production, marketing and distribution; **GIZ County Agricultural Office, KEPHIS, SNV, NPCK, KIBT and CIP**
- Intensify efforts to raise awareness of benefits associated with the use of quality seed (advertising, demonstrations) among all stakeholders (traders, ware growers, policy makers); **County Agricultural Office, ASDSP, SNV, NPCK,**
- Support development of Online and SMS-based seed directory; **County Agricultural Office, ASDSP, SNV NPCK.**
- Support construction of appropriate seed storage facilities (diffuse light stores); **County Agricultural Office, KALRO, NPCK and CIP**
- Implement appropriate locally adapted seed quality control, traceability schemes and branding with decentralized seed producers. **County Agricultural Office, ASDSP, SNV, KEPHIS, KALRO, NPCK and CIP**
- Train community-based and/or seed growers groups/ cooperative-based inspectors to pilot Quality declared planting material (QDPM), and improve easy-to-use and low-cost disease detection methods; **County Agricultural Office KEPHIS, KALRO, NPCK, CIP, Agrochemicals**
- Develop a system of quality pest and disease management (QPDM) committees and capacity building; **County Agricultural Office, KALRO, NPCK, CIP and Agrochemicals**
- Advocate for the institutionalization of the QDPM concept at county, regional and national levels; **County Agricultural Office, KEPHIS, KALRO, NPCK.**
- Pilot low-cost, easy-to-use disease diagnostic tools (e.g., pocket diagnostics, bioassays) **County Agricultural Office, KEPHIS, KALRO, NPCK, CIP**
- Promote adoption of rapid seed multiplication technologies (aeroponics, hydroponics, seed plot, cuttings) and off-season seed production (irrigation systems): **County Agricultural Office, KEPHIS, KALRO, NPCK, CIP**

### 3.2.3 Objective 3: Increase productivity through improved farming practices.

#### 3.2.3.1 Situation and challenge:

Potato crop performance relies on the skills and capacities of farmers to utilize the benefits of high quality seed by applying adequate agronomic measures. Increasing productivity requires quality seed and good agricultural practices (GAP), such as Integrated Pest Management (IPM), to manage pests and diseases cost-effectively and in an environmentally sound manner. Disease and pests is not only a principal obstacle to seed quality, but also significantly impacts on ware potato production. Bacterial wilt is the most devastating disease leading to massive potato losses among the small holder farmers.

Interventions should target improvement of the ability to select quality seed, best production practices, and postharvest handling and storage. Training materials are already available that help facilitators train farmers to maintain seed quality and improve yields through on-farm sanitation, rotation and GAP. The strategy is focusing on extension interventions - to support farmers to maintain quality seed *at the farm level* and improve yields of ware potato.

Diseases and pests are major challenges facing potato producers in the county.

#### 3.2.3.2 Specific proposed interventions

- Train TOTs and extension service providers to train farmers in on-farm seed quality maintenance (Positive Selection, small seed plot technique, etc.); **County agric office, KALRO, SNV, CIP, ASDSP, GIZ, AGRA, NPCK**
- Improving smallholder farmers' capacity to apply basic production practices such as spacing, fertilizer rates and types (after soil analysis), weeding time, diseases and pests control, hilling and dehaulming, harvesting at full maturity to reduce post-harvest losses and reach full yield potential etc. Capacity of farmers should be built to maintain seed quality and improve yields through on-farm sanitation, rotation and GAP. Farmers should be supported to produce quality seed at the farm level to improve yields and quality of ware potato; **County Agric Extension Service, KALRO, ATC's, CIP, GIZ, AGRA, NPCK**
- Adapt and tailor existing manuals and leaflets describing best agricultural practices for potato production and distribute to extension service providers; **County Agric. Extension Service, ASDP, KALRO, GIZ, CIP, NPCK**
- Research on fertilizer blends suitable for potato farming will be developed within a CIP led project in cooperation **with County extension service, fertilizer manufacturers, Universities, KALRO**
- Promising control options derived from research of the Universities and CIP will be evaluated at farmer's field and if shown to be successful at an affordable cost, will be promoted. **County Agric Extension Service, KALRO, GiZ, CIP, Universities, NPCK.**

### 3.2.4 Objective 4: Mechanization and use of irrigation in potato production

#### 3.2.4.1 Mechanization of potato production

##### 3.2.4.1.1 Situation and challenge:

In potato production there is inadequate use of farm machineries for potato farming in the county. Labor is becoming more expensive and in many cases is not even available when needed. This leads to low productivity of crop land in the county. Smallholder farmers are usually not able to afford machinery individually nor are they aware of specific machineries for potato farming. For Nyandarua County, Agricultural Mechanization Services (AMS) and ATC Njabini are currently offering limited mechanization services such as ploughing, harrowing, planting, ridging and harvesting.

##### 3.2.4.1.2 Specific proposed interventions

- The strategy involves introduction of farm machinery for cultivation, planting, harvesting and grading. **County Agricultural Extension Service, AMS Nyahururu, NYS Tumaini, GIZ and private sector companies.**
- Availing information and creating awareness of the potato production using farm machinery; **County Agricultural Extension Service, AMS Nyahururu, NYS Tumaini, KALRO, CIP, GIZ, NPCK**

#### 3.2.4.2 Irrigation in Potato Production

##### 3.2.4.2.1 Situation and Challenge

There is overreliance on rain-fed production of potatoes in the County. The county has high potential for irrigation production which has not been harnessed. The county is endowed with permanent rivers and suitable sites for dam and water-pan construction. Due to climate change, the county has been experiencing erratic rainfall which cannot sustain production.

##### 3.2.4.2.1 Specific proposed Interventions

- Construction and rehabilitation of dams and water-pans,
- Promotion of conservation agriculture technology,
- Promotion of irrigation to avoid crop failures and the overreliance on rain fed production
- Research on agronomic practices suitable for irrigated potato production, documentation, packaging and dissemination of information.

**County Agricultural Extension service, GIZ, NPCK, KALRO, CIP, Private Sector**

### 3.2.5 Objective 5: Improve pre- and postharvest management and market access by linking value chain players

#### 3.2.5.1 Situation and challenge:

There is no well-defined marketing strategy for potato in the County which makes farmers more vulnerable to exploitation by traders. Potatoes in Nyandarua are sold at the farm gate prices with most of the times prices are determined by the traders. Potatoes being a perishable crop, farmers are forced to sell it as quickly as possible to avoid losses, in particular with some varieties which start sprouting a few weeks after harvest compromising on its quality. There is little value addition done to potatoes in the county. Some groups have started venturing in potato processing on a village level basis but they need support to form cooperatives large enough to benefit from economies of scale. However, the potato varieties grown in the County are not good for processing.

Insufficient pre- and postharvest management is one of the major constraints to increased year-round utilization of potato. Surplus supply of potatoes during peak harvest periods leads to postharvest losses, very low prices (discouraging farmers) at times of abundance, and very high prices (discouraging consumers) at times of scarcity. As urbanization proceeds apace, reduced postharvest losses and extending periods of availability will be key for potato to continue playing a major role in food security and being a good source of farm income. Improving pre- and postharvest management would extend the marketing window for potato farmers, while maintaining product quality. 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, with the feedback loop to further increase market demand and opportunities for farmers. Additionally, by creating opportunities along the value chain the county aims at making potato farming a more attractive venture that can lure back the youths into farming.

Lack of standardization in potato marketing is one of the major bottlenecks in the county that lead to low prices, wastage and losses, lack of and/ or poor data and poor health of the handlers.

#### 3.2.5.2 Specific proposed interventions

- Create linkages in the value chain between farmers, traders, transporters, processors and consumers; **County Agricultural Extension Service, ASDSP, NPCK, GIZ, AGRA**
- Form farmer- groups, associations and cooperatives empowering them to have a stronger position when approaching input and output markets to enjoy economies of scale. This can lead to an establishment of collection centers, processing, input purchase, access to credit seed and ware potato storage, regular extension advice, and coordinated transport arrangements and marketing; **County Agricultural Extension Service, ASDSP, NPCK, CIP, AGRA**
- Improve and commercialize potato processing leading to added benefits in terms of increased demand of diverse potato products, increased income, and improved access to assured markets and often higher market prices. Processing will reduce postharvest losses; **County Agricultural Extension Service, NPCK, KIBT, KIRDI, AGRA**
- Promote adoption of processing varieties. **County Agriculture Office, KALRO, CIP,**

**GIZ, AGRA, NPCK.**

- Improve post-harvest handling to maintain quality and reduce post-harvest losses by at least 40%; **County Agricultural Office, GIZ, AGRA, NPCK**
- Develop /Link with ICT platforms to provide market and sales information to farmers to enable them to track their potatoes in the market and confirm their sale price, and access seed repository to receive information on variety and seed quantity information by seed supplier. **County Agricultural Extension Service, NPCK, GIZ, CIP, AGRA, Private Sector.**
- Train farmer groups and cooperatives in proper harvest and postharvest handling and treatments to reduce tuber damage and rots from disease and insect pests; **County Agricultural extension Service, NPCK, CIP, AGRA, KALRO**
- Promote and disseminate improved postharvest technologies such as ambient cold store and diffuse light systems for ware and seed potato, respectively; **County Agricultural extension Service, NPCK, AGRA, CIP, KALRO**
- Improve quality of marketed potatoes through proper packaging and labeling to enhance branding and traceability. **County Agricultural Extension Service, ASDSP, AGRA, NPCK, KEPHIS.**
- Increase potato storage facilities to at least one per sub-county as well as exploring the possibility of introducing lower cost ambient cold stores. This can lead to an establishment of collective storage centers which can allow collective initiatives such as processing, input purchase, access to credit, seed and ware potato storage, regular extension advice, and coordinated transport arrangements and marketing; **County government, development partners and KALRO.**

### **3.2.6 Objective 6: Support, implement and enforce policy and regulations that enhance development of potato value chain**

#### **3.2.6.1 Situation and challenge:**

The potato value chain has inadequate specific policies, legal and regulatory framework that could help develop the industry. Acceleration of the value chain growth requires regulations that will facilitate improvement of production and enhancement of marketing within and between Counties and in the region. There is need to harmonize potato production and marketing standards to encourage free trade in the region. Policies on inputs, such as fertilizer, have not adequately targeted potatoes for decades and have failed to put into account the agronomic differences and nutritional requirements of potatoes.

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 are just but a few areas that show the need for experts and policy makers to engage at county and national levels to draw policies and regulations supportive to the growth of the industry

### 3.2.6.2 Specific proposed interventions

- Support development and implementation of policies, regulations and strategies on potato production, processing and marketing through engaging Council of Governors, Senate, Parliament and County Assembly; **County government, State department of agriculture (SDA), NPCK, CIP, KALRO, GIZ, KEPHIS.**
- Enact, *enforce* and implement at County level policies and regulations that facilitate improvement of potato production and marketing; **County government and County Assembly**
- Spearhead eradication of extended bag in potato marketing and implementation of AFA regulations on packaging by supporting formulation and implementation of relevant bills, regulations and partnership at national and County levels. Create awareness of packaging regulations to farmers, traders, law enforcers, judiciary and other relevant actors and players. Work with partners and other relevant bodies to ensure appropriate packaging bags are available; **County government(SDA), County government, ASDSP, NPCK, CIP, KALRO, GIZ**

### 3.2.7 Objective 7: Coordination, collaboration and funding

#### 3.2.7.1 Situation and challenge:

The potato value chain for many years has benefited from many initiatives by government, development partners and other stakeholders at the County and grassroots levels. However, these initiatives have lacked central planning, leveraging and coordination. There is need for stakeholders to work together in order to achieve guided and sustainable development of the value chain.

#### 3.2.7.2 Specific proposed interventions

- Implementation of Potato strategy and coming together of stakeholders under leadership of County government in partnership with **NPCK, CIP, GIZ, and Grow Africa** is expected to lead to organized interventions that will lead to a robust and competitive potato value chain in the County.
- A select implementation committee appointed from core partners and members of the taskforce will guide and oversee the implementation of the strategy; **County Agricultural office, NPCK, CIP, GIZ, Grow Africa.**



**Figure 4: A section of participant of the Stakeholders meeting in Nyandarua County**

### **3.2 Action plans and time lines**

The following table summarizes the current status, target status, action plans and timelines. For each objective there are identified interventions that are aimed at achieving the targeted status and the timeline.



### 3.3.1 Objective 1: Participatory evaluation of breeding line and variety demonstrations

Current status	Targeted status	Activity	Targets	Resources (Kshs)	Responsible	Time line
Overreliance on Shangi which is the dominant variety due to its market preference, early maturity, short dormancy. Farmers are able to grow potatoes 3 times a year and practice staggered planting and harvesting throughout	Wide diversity with different options for variety choice and market opportunities	Demonstration trials with the newly registered varieties with market demanded attributes (25 demos in the county) -Capture and analysis of data	At least 3 varieties recommended for adoption in the county	375,000	County Agricultural office, GIZ, KALRO, SNV, IFDC/ Agrico, Murphis, Syngenta, Bayer, CIP, KEPHIS, NPCK, Farmers, Cooperatives, AGRA-Grow Africa	2017-2021
		Evaluation of drought tolerant varieties under low rainfall conditions	At least 2 drought Tolerant varieties introduced	187,500	County Agricultural office, KALRO, GIZ, CIP, GTIL, KEPHIS, NPCK, Farmers, Cooperatives,	2017-2021

### 3.3.2 Objective 2: Improvement of production capacity of high-quality seed potato

Current status	Targeted status	Activity	Targets	Resources (Kshs)	Responsible	Time line
-Limited supply of high-quality seed.  -High seed prices (Kshs 2500- 3,000/ 50kg bag)	High quality seed of farmer and market preferred varieties are available and accessible in enough quantity (6,600 tonnes) and prices reduced by at least 25%	Facilitate existing certified seed producers (private and Public sector) to increase Production (include revolving fund for 2 ATCs)	Produce 6,600 tonnes of certified seed, from at least 300 ha under seed production	6,000,000	NYS, ATC's and others supported by CIP, NPCK and KALRO, farmer groups and cooperatives, private investors, More seed Multipliers, Farmers group with capabilities of doing irrigation	2017-2021
			Establish at	3,500,000	NYS Tumaini and	2017-2021

			least 3 aeroponics/ hydroponic plants for mini-tuber production		Private sector supported by CIP, NPCK, KALRO and county Government	
			Establish one Tissue labs	10,000,000	County government, KALRO, KEPHIS, CIP, NPCK	2017-2021
		Identify and build technical capacity of new certified seed producers.	Train 10 certified seed individual producers (2 Per sub county)	250,000	NPCK,ASDSP,SNV, KALRO, ATC, AGRA-Grow Africa, KEPHIS, County Agricultural Office, CIP, producers.	2017-2021
		Identify and develop technical and entrepreneurial capacity of seed potato out growers (Farmers groups, cooperatives) and link them to basic seed producers	Train 50 seed producers (10 per sub county)	1,000,000	NPCK,ASDSP,SNV, KALRO, ATC, AGRA-Grow Africa, KEPHIS, County Agricultural Office, CIP, producers.	2017-2021
			Link 50 seed Producers to the markets	100,000	County Agricultural Office, GIZ, ASDSP, SNV,AGRA-Grow Africa NPCK, KIBT and CIP.	2017-2021
		Intensify efforts to raise awareness of benefits associated with the use of Quality seed (advertising, demonstrations) among all stakeholders (traders, ware growers, policy makers)	Hold 5 seed potato field days annually (one per sub-county)	5,000,000	County Agricultural Office, GIZ, ASDSP, SNV, AGRA-Grow Africa NPCK, KIBT and CIP.	2017-2021
			Hold 4 annual seed fairs		County Agricultural Office, NPCK, ASDSP,SNV,KAP AP, Private sector,	2017-2021

					CIP, KALRO, SNV, NGOs,	
		Support development of online and SMS- based platform and seed directory	Establish data base of seed producers and seed distribution system	200,000	County Agricultural Office, GIZ, ASDSP, SNV, AGRA-Grow Africa NPCK, KIBT and CIP.	2017-2018
			Support annual publication of seed catalogue	1,500,000	County Agricultural Office, NPCK	2017-2021
		Support construction of appropriate seed storage facilities (diffuse light stores)	Construct 50 DLS	25,000,000	County Agricultural Office, KALRO, NPCK, CIP and seed producer	2017-2021
		Implement appropriate seed Quality control, traceability schemes and branding with trained seed producers	Facilitate registration of 5 cooperatives as seed producers	500,000	County Agricultural Office, KEPHIS, KALRO, NPCK, CIP and seed producers	2017-2019
		Train inspectors to pilot QDPM, and improve easy-to- use and low-cost disease detection methods.	Train 10 seed inspectors (2 per Sub County)	1,000,000	County Agricultural Office, SNV, KEPHIS, KALRO, NPCK, CIP, AGRA, GIZ	2017-2019
		Pilot low-cost, easy-to-use disease diagnostic tools (e.g., pocket diagnostics, bioassays)	Procure assorted diagnostic tools to be used by inspectors	1,000,000	County Agricultural, Office, KEPHIS, KALRO, NPCK, CIP	2017-2019

**Objective 3: Increase productivity through improved farming practices**

Current status	Targeted status	Activity	Targets	Resources	Responsible	Time line
Poor production practices for both seed and ware potato	Improved production productivity through use of good agronomic practices	Train TOTs and extension service providers to train farmers in on-farm seed quality maintenance (Positive Selection, Seed plot technique, QDPM, Pest and disease management etc)	Train 50 extension service providers and 3 TOT per producer group/ cooperatives	1,000,000	County Agric office, ASDSP, KALRO, CIP, GIZ, AGRA-Grow Africa, NPCK, SNV, MOALF-SDA	2017-2021
		Improving smallholder farmers' capacity to apply basic production practices such as spacing, fertilizer rates and types (after soil analysis), weeding time, disease control, hilling and	Train at least 10,000 farmers on GAP	1,000,000	County agric extension service, KAPAP, KALRO, ATC's, SNV, BAYER, SYNGENTA, CIP, GFP- PIA, NPCK.	2017-2021
		dehauling, harvesting at full maturity to reduce post-harvest losses and reach full yield potential etc. The need for capacity building of farmers is thus key for their				

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		Adapt and tailor existing manuals and leaflets describing best agricultural practices for potato production and distribute to extension service providers	Production and publication of training manuals, brochures and leaflets	1,000,000	County agric extension service, KALRO, CIP, NPCK, GIZ, MOALF-SDA	2017-2018
		Research and promote on fertilizer blends suitable for potato farming will be developed within a <b>CIP</b> led project	Conduct at least 5 on-farm fertilizer trials and hold result demos	100,000	CIP, County extension service, fertilizer manufacturers, Universities, KALRO, NPCK, AGRA-Grow Africa	2017-2021
		Set up pest and disease management demos	Five demos on pest and disease management established	100,000	County agric extension service, KALRO, GIZ CIP, Universities, AGRA-Grow Africa	2017-2021
		Mobilize formation of cooperatives to empower them on production and marketing	At least 5 cooperative s formed	100,000	County Agricultural Extension Service, NPCK, KENAFF, Department of cooperatives	2017-2018
			Construction of at least 5 collection centers	3,000,000	County government and development partners,	2017-2018
			Operationalizing the existing markets	300,000	County Agric office, Financial institutions, department of trade, cooperatives	2017-2018

### 3.3.3 Objective 4: Mechanization and use of irrigation in potato production

Current status	Targeted	Activity	Targets	Resources	Responsible	Timeline
Inadequate use of farm machineries for potato production and high harvesting losses	Mechanization is increased to reduce over reliance on human labour –Reduced harvesting losses	Promotion of farm machinery for cultivation, planting, harvesting and grading operations	planters, Harvesters, boom sprayers, tractors	1,000,000	County Agricultural Extension Service, AMS Nyahururu, NYS Tumaini, cooperatives, Farmer groups and cooperatives, GIZ and private sector companies, development partners	2017-2021
Expensive manual labor which is not readily available when needed.	Reduced cost of production	Training of plant operators,	70 demonstrations	210,000	County Agricultural Extension Service, AMS Nyahururu, NYS Tumaini, cooperatives, Farmer groups, GIZ and private sector companies, development partners	2017-2020
		Publicity of farm machinery	Hold 5 mechanization on farm machinery	5,000,000	County Agricultural Extension Service, AMS Nyahururu, NYS Tumaini, cooperatives, Farmer groups, GIZ, AGRA-Grow Africa, NPCK and private sector companies, development partners	2017-2021
Inadequate and erratic rainfall in some areas of the county	Adequate water is available for potato production	Construction and rehabilitation of dams and water-pans.	Construct 25 water pans/dams of at least 20000cubic	25,000,000	County Government, County Agricultural Extension service, GIZ, Private Sector, AMS Nyahururu, NYS Tumaini.	2017-2020
		Initiate irrigation project	Atleast 2 mega irrigation project	50,000,000	County Government, County Agricultural Extension service, department of irrigation, NPCK, Private Sector, AMS Nyahururu.	2017-2020

<b>Current status</b>	<b>Targeted</b>	<b>Activity</b>	<b>Targets</b>	<b>Resources</b>	<b>Responsible</b>	<b>Timeline</b>
		Promotion of conservation agriculture technology.	Conduct 50 demos on CA	100,000	County Agricultural Extension service, GIZ, AGRA-Grow-Africa, KALRO, CIP, NPCK Private Sector, AMS Nyahururu, NYS Tumaini.	2017-2021
		Attract youth in through mechanized potato production and operation of machinery	Train atleast 5 youth groups	200,000	County Agricultural Extension service, GIZ, AGRA-Grow-Africa, KALRO, CIP, NPCK Private Sector, AMS Nyahururu, NYS Tumaini.	2017-2020

### 3.3.4 Objective 5: Improve pre- and postharvest management and market access by linking value chain players

Current status	Targeted status	Activity	Targets	Resources	Responsible	Timeline
Poor marketing system.	Period per year of availability of good quality potatoes of different varieties is extended and prices are stabilized	Create and enhance market linkages in the value chain between farmers, traders, transporters, processors and consumers.	Hold 12 annual stakeholder Fora/platforms at County and sub county levels.	3,000,000	County Agricultural Extension Service, NPCK, GIZ, AGRA-Grow Africa Farmer cooperatives	2017-2021
		Undertake market surveys to provide market intelligence	At least two market survey per year	1,000,000	County Agricultural Extension Service, SNV, NPCK, AGRA-Grow Africa, County dept of Cooperative and Trade, Cooperatives/ SACCOS	2017-2021
		Strengthen cooperatives and farmers union	Hold 2 capacity building trainings for officials	500,000	County dept of Cooperative and Trade, County Agric extension, NPCK, AGRA-Grow Africa	2017-2020
		Link cooperatives farmer groups to market outlets	At least 5 business contracts signed	500,000	County Agricultural Extension Service, NPCK, County dept of Cooperative and Trade, Cooperatives/ SACCOS	2017-2021



Current status	Targeted status	Activity	Targets	Resources	Responsible	Timeline
		Training of individual/groups and cooperatives on processing technologies and certification	At least 5 Individuals/groups/cooperatives trained	200,000	County government, County agric office, County dept of Cooperative and Trade, KIBT, KIRDI, GIZ, AGRA-Grow Africa	2017-2021
		Train farmers on pre-and post-harvest management	At least 50 farmer groups/ cooperatives trained per year	1,000,000	County Agricultural Office, GIZ, Farm concern International, KENAFF, SNV, Department of cooperative	2017-2021
		Develop /Link with ICT platforms to provide market and sales information to farmers to enable them to track their potatoes in the market and confirm their sale price, and access seed repository to receive information on variety and seed quantity information by seed supplier	Enroll 20,000 potato producer on e-extension platforms	200,000	County Agricultural Extension Service, GIZ, AGRA-Grow Africa NPCK, Private Sector.	2017-2021
		Improve quality of marketed potatoes through proper packaging and labeling to enhance branding and traceability.	Customize the potato standard in the county.	100,000	County Agricultural Extension Service, NPCK, Cooperatives /Farmer groups	2017-2021
		Increase potato storage facilities to at least one per sub-county as well as exploring the possibility of introducing lower cost ambient cold stores	Construct 7 storage facilities	15,000,000	County government, GIZ, AGRA-Grow Africa, NPCK, Cooperatives, SNV, IFDC, other development partners and KALRO.	2017-2021

### 3.3.5 Objective 6. Support, implement and enforce policy and regulations that enhance development of potato value chain

Current status	Targeted status	Activity	Targets	Resources	Responsible	Timeline
The potato value has inadequate specific policies, legal and regulatory framework that could help develop the industry	<p>Policies and regulations that accelerate Improvement of Production and Enhancement of marketing within and between counties and in the region are in Place .</p> <p>(Areas to be addressed by policies and regulations include warehouse receipting system, contract farming, marketing standards, traceability, production and use of Suitable fertilizer, Accreditation/ Authorization of certification services, QDPM, funding and interest rate for agricultural loans)</p>	<p>Support development and implementation of policies and regulations on potato production, processing and marketing.</p> <p>-Engagement of Council of Governors, Senate, parliament, State department of Agriculture and County assembly to enact potato policies, acts and regulations</p> <p>-Awareness creation and enforcement of potato produce and marketing regulations and standard</p> <p>-Partner with other Potato producing Counties, NPCK, SDAs and relevant players in implementing laws and regulations.</p>	<p>-Develop, review and implement policies and regulations that are supportive to potato value chain</p> <p>-Organize forums with Key County and National policy makers</p> <p>Media advertisement</p>	2,000,000	County government, State department of agriculture (SDA), NPCK, CIP, KALRO, GIZ, AFA, AGRA-Grow-Africa KEPHIS,	2017-2021

**3.3.6 Objective 7: Coordination, collaboration and funding of the strategy**

Current status	Targeted status	Activity	Targets	Resources	Responsible	Timeline
Limited central planning, leveraging and coordination of potato value chain activities	A well thought and practical potato strategy with well coordinated activities and collaboration in the potato value chain	Core partners (County government, NPCK, CIP and GFP) offer leadership in development of the potato strategy	Implement five years Potato Strategy for Nyandarua County	500,000	Nyandarua County, NPCK, CIP	2017-2021
		Formation of implementation committee ,Partnership building and linkages	Form one implementation committee -Partnerships and collaborations established and agreement/letter of understanding signed(MoU)		Nyandarua County, NPCK, CIP, GIZ, AGRA-Grow Africa other development partners and key players	2017-2021

## Annex I

## List of participating organizations and their activities

Organization/institution	Activities
Acumen	Financing
ADC -Molo	Service provider- Seed production
AMS- Nyahururu	Agricultural Machinery Provider
ASDSP	Service provider- Value chain development and promotion
ATC Oljoro-orok and Njambini	Service provider- Extension services
Bayer E. A	Service provider- crop protection
CDA- Nyandarua	Extension services
CIP	Technical adviser and financial assistance
EAFF	Farmer Federation
Equity Bank- Olkalou	Financing
Family Bank- Olkalou	Financing
Farm concern	Service provider
Farmer- Groups	Farmer
Huhoini CBO	Farmer
IFDC	Development partner
Kanyagia CV	Farmer
KAPAP	Service provider-Value chain development and promotion
KALRO	Service provider- Research
Ken Wide	Service provider in capacity building in KAPAP.
KENAFF	Famer Federation
KENAPOFA	Civil society
KEPHIS Nakuru	Quality assurance
KIBT	Capacity building(Business trainings)
KIPOSPAH cooperative	Potato Marketing
KIRDI	Agro processing.
Kisima- Farm	Seed production
Local Processor-OljoroOrok, Ndaragwa, Kinangop, Olkalou	Potato processing
Ministry of Agriculture Livestock and Fisheries	Capacity building trainings on GAP, processing and marketing.
Murphy Chemicals	Service provider- crop protection
National Potato Council of Kenya	Coordination, planning and linkages
NYS- Tumaini	Seed Multiplication
PASIMU CBO	Farmer
SHOMAP	Development programme/ partner
SNV- Kenya	Service provider
Sub-County Agricultural Officers	Service provider- Extension services fromNdaragwa, Olkalou, OljoroOrok, Kinangop, Kipipiri, Miragine
SUERA Farm	Service provider- Seed multiplication.
SYNGENTA Co. LTD	Development partner, input company
Traders	marketing
WakulimaPamoja CBO- Njabini	Potato Marketing