Kingdom of Cambodia

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Royal Government of Cambodia

National Cassava Policy 2020-2025

Approved by Council of Ministers

at Its Plenary Meeting on 14 August 2020

Prepared and published by:

Ministry of Commerce

General Directorate of Trade Promotion

Trade Policy Department

Supported by:

United Nation Development Programme (UNDP)

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Samdech Akka Moha Sena Padei Techo Hun Sen
Prime Minister of the Kingdom of Cambodia

Forward

In its peaceful era, Cambodia has succeeded in moving from a least-developed country to a lower-middle-income country. The achievement of high economic growth for many decades has substantially reduced poverty, lowering it to 10 percent in 2018, while expanding economic bases. Cambodia has connected with multiple global value chains and has been enhancing its potential to be a regional centre of diverse products and services for which it has competitive advantages and opportunities.

In tandem with the country's ongoing progress and long-term development visions, especially to
become a high middle-income country by 2030 and a high-income country by 2050, the National Cassava Policy focuses on economic-based diversification which creates new businesses and simultaneously diversifies existing, vibrant economic activities. Among core economic sectors, agriculture still plays a pivotal role in sustaining economic growth and reinforcing local economic development. The majority of households and approximately 37 percent of the local labour force have been engaged in this sector and worked on farms in accordance with the seasonal calendar, as part of planting, processing, transport, and export.

Having realized the key linkage between agri-business development and rural livelihood improvement, particularly employment and job creation for rural labor, the Royal Government of Cambodia has imposed supporting measures integrating market demands, global value chains, and the production system into a single policy and action plan. From now onwards, cassava, the second priority crop after rice, will receive special treatment in order to realize its maximum benefits and transform it into a dynamic agent for agro-industrial development in Cambodia, a target which is aligned with the Industrial Development Policy 2015-2025. Increasing capacity to process high-end products for global markets returns international currencies and boosts circular economies by connecting agriculture subsectors within domestic industries.

On behalf of the Royal Government of Cambodia, I would like to congratulate and appreciate the Ministry of Commerce, Ministry of Agriculture, Forestry and Fisheries, Ministry of Economy and Finance, Ministry of Industry, Science, Technology and Innovation, related ministries,

development partners, the private sector, farmers, research institutes, and all relevant stakeholders for formulating this policy. Contributions such as finance, knowhow, technical assistance, and information, alongside responsibility and commitment are priceless assets for this successful start-up phase vis a vis implementation and monitoring phases.

Based on the successful experiences and lessons learned from the Policy on Promotion of Paddy Rice Production and Export of Milled Rice, I strongly believe that Cambodia will impress the world again with its supply of cassava-derived food and industrial inputs. I am optimistic that the achievements of the National Cassava Policy will bring prosperity to local economies, leading to expansion of the national economy and improved livelihoods to people through the establishment of sustainable cassava production and the emergence of diverse processing industries in Cambodia. Since this policy is also a key element of the Rectangular Strategy IV and the National Strategic Development Plan (2019-2023), I would like to encourage and appeal all stakeholders to support and effectively join in implementation of this policy.

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Phnom Penh, 05 September, 2020

Hun Sen

Table of Contents

1.Introduction

The policy has achieved strong economic growth for many years, contributing to Cambodia's reputation as Asia's new tiger economy[1]. This constant growth has resulted in remarkable poverty reduction and has improved the welfare of many Cambodians. The economic successes originate from the Government's ability to maintain peace, stability, and social cohesion, which are the cornerstones of the foundations of timely administrative reforms and the implementation of effective policies for attracting investment, as well as smooth integration into the global economy and trade liberalization. The policies have driven the development of various sectors, such as tourism, garments, construction, and the export of milled rice.

To maintain economic growth, achieve the Sustainable Development Goals, and accommodate graduation from least-developed country status to lower-middle-income country status, this policy sets robust commitments to diversify Cambodia's economic bases away from traditional sectors. This envisions a pathway to move up currently active and potential new value chains. Transforming from subsistence agricultural production to agro-industrial-based development is one of the Royal Government of Cambodia's top priorities to create new and better jobs and develop skills. This consequently raises the incomes of Cambodians and links cross-cutting sectors to enlarge the country's economies of scale.

The policy has capitalized on the potential of cassava as a crop for resource-poor and/or smallholder farmers to improve their livelihoods, and as a contributor towards industrial development. The bright prospects of the crop for Cambodia align with the rest of the world, which values cassava as a 21st century crop and the food of the 21st century[2].

Over decades, the policy has kept abreast of the cassava evolution as follows:

Growth of cassava production: The fast expansion of cassava planting areas over the last decade means it is the second largest crop in the country. It is estimated to contribute between 3 percent and 4 percent of the GDP[3]. Almost US$300 million has been invested each year to cultivate cassava over a planting area of 600,000 ha, while export, mainly in the form of fresh roots and dry chips, is worth approximately US$728 million[4]. The sector has involved more than 90,000 rural households in 13 provinces in cassava cultivation and created many seasonal jobs for local labourers. There are 550 collection centres concentrated in the five largest provinces. These have direct routes to nearby ports in neighbouring countries. 14 out of 17 starch processors are operating, while one new processing plant is underway. Seven ethanol distillery plants close to the capital have operated for years.

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[1] ADB (2016) Here Comes Cambodia: Asia's New Tiger Economy, 10 May 2016, https://www.adb.org/news/features/here-comes-cambodia-asia-s-new-tiger-economy.

[2] FAO 2013, Save and Grow: Cassava- A Guide to Sustainable Production Intensification downloaded through https://reliefweb.int/report/world/save-and-grow-cassava-guide-sustainable-production-intensification

[3] UNDP 2016, Cassava Value Chain In Cambodia

Emergence of cassava production in Cambodia: The growing demand for dry chips for ethanol and starch in China creates a dynamic trade system between East and Southeast Asia. Put simply, the system sees China as a monopsony, and neighbouring countries as the two main regional suppliers, while Cambodia acts as a producer. The two countries could not expand their planting areas due to competition with other cash crops (value added and higher prices) and government policies that allow only less fertile and non-irrigated land to be used for cassava cultivation. Acting as reliable suppliers to China and the world, Thailand and Vietnam create cassava markets for Cambodia and an indirect support system where agricultural inputs are sold and agronomic practices are shared informally to farmers. As a result, cassava has been grown mostly along borders, and over time, spread into areas where land is available, such as cashew nut and rubber plantations and/or idle or newly deforested plots.

Regional value chain structure: The cassava market in Asia creates a regional value chain where Cambodia grows, harvests and chops, while neighbouring countries, having market dominance and trade competitiveness, carry out the roles of processing, storage and export. Despite the size of production, which is ranked fourth in the region and eighth in the world[5], Cambodia has not been well known in the global market, rather it has fulfilled demand silently in the name of a marginal supplier and price taker.

Cassava is a commercial crop and is not a staple food for Cambodians, as opposed to Indonesians, Indians, Africans, and some Latin Americans. It is grown for export and a small amount is used for food and feed in the country. Over decades, it has been exported as fresh roots, which are later processed into starch and ethanol-grade chips to neighbouring countries. Adding to their own cassava outputs, the two neighbouring countries have re-exported those products to China. Direct export from Cambodia to China is minimal and is worth US$15.5 million or 81,497 metric tons of chips, and US$10.5 million or 30,937 tons of starch in 2016[6]. So far, the export volume has not increased remarkably.

Market outlook: Cassava is grown in more than 90 countries in Africa, Latin America and Asia. It is the most important staple crop after rice, maize, and wheat, and feeds 770 million people. Its global production increased 2.5 percent during 2009-2016 and reached 280 million tons in 2016[7].

Over the past two years, the global cassava trade has been sluggish, with price drops in other starchy crops, mainly corn and wheat. The processing cost between cassava-based products and alternatives has narrowed, so the competitiveness of cassava has decreased. Downstream industries in many countries have reacted by shifting to cheaper substitute materials. Changes in Chinese agricultural policies have had adverse consequences for the cassava price. Removing subsidies on

[4] Cassava Industry Analysis Report (2017) ASCS-Radius for its client, Green Leader Co. Ltd.

[5] FAO's statistic downloaded on 30 October 2018 through http://www.fao.org/faostat/en

[6] ITC's trade map, data retrieved in March 2018.

corn production and the release of corn stock in China in the growing season 2016/2017 caused the corn price to plummet, from US$360 to US$200 per ton. This pushed the cassava price in the south-east Asian region down significantly (US$160 per ton for dry chip and US$320 per ton for starch). From 2017 to 2018, the cassava price increased from its lowest in 2016/2017 to high levels not seen since the mealybug crisis in 2010. The shortage of supply is a prime factor driving the price up, due to a reduction in planting areas, flooding, and diseases in neighbouring countries and Cambodia[8] . The price will tend to level off from now until a new harvesting season in 2018/2019.

Looking at global cassava markets, China is still, and will continue to be, a giant buyer of cassava chips and starch from the southeast Asian region, accounting for 77 percent of the global market in 2016. Although China has reached a self-sufficient capacity of corn production, it expects to depend on global grain markets to secure its supply (as corn production is sensitive to climate) and to ensure that its large population is well fed. Remarkably, the recent announcement of mandating E10 in the whole of China is a signal that materials and distillery capacity will be increased to reinforce this policy implementation[9].

Cassava starch accounts for 8 percent of total global starch production. The market reached a volume of 6 million tons, registering a Compound Annual Growth Rate (CAGR) of 2.2 percent from 2009 to 2016. Global demand for cassava starch is expected to grow at a CAGR of 1.9 percent between 2017 and 2022, reaching a volume of 7.4 million tons by 2022[10]. It is being used in the production of sweeteners, as a thickening agent and food additive, as well as an active ingredient in many food items. Cassava starch also has a wide range of applications in other industries, such as pharmaceuticals, paper, textiles, processed food, and beverages.

Starch residues offer many opportunities to create other by-products and derivatives. These include ingredients in animal feed (primarily pelletized cassava residues), fertilizers, or biofuel including pellets or biogas. As starch production capacity increases in Cambodia, the volume and value of residues will increase and there will be opportunities to develop by-products both for the domestic market and export.

Ethanol has been seen as a potential product for Cambodia if there is serious consideration from relevant stakeholders.

To be sustainable, cassava will be transformed into end products whose markets are diverse and prices are dependent on each value chain. Focusing on domestic markets is one option to explore, as the cost of products can compete with foreign products, which are expensive to import into

[7] IMARC (2017) Cassava Starch Market: Global Trends, Share, Size, Growth, Opportunity and Forecast 2017-23, www.imarcgroup.com

[8] CIAT (2018) Cassava markets: Value chains and livelihoods in Asia: When certainty is the only certainty, Cotonou, Benin.

[9] Analysis: 'China's nationwide E10 Ethanol mandate faces hurdle', downloaded from https://www.patts.com/latest-news/agriculture/singapore/analysis-chinas-nationwide-e10-ethanol-mandate-26808971.

[10] IMARC (2017) Cassava Starch Market: Global Trends, Share, Size, Growth, Opportunity and Forecast 2017-22, www.imarcgroup.com.

Cambodia. For example, in Nigeria, cassava flour is mandated to be blended at least 10 percent with wheat to reduce the importation of expensive wheat costing the country millions of dollars[11] . Cassava dry chips and leaves in a ratio of 4 to 1 are found to replace maize in poultry feed and reduce feed costs without jeopardizing weight gain or egg production[12] . In Indonesia, research shows that cassava flour-based wet noodles are 80 percent like wheat flour noodles[13] . In Mozambique, cassava has been used to brew beer to replace the importation of barley[14] . A US company produces sweetener from cassava as an alternative to cane sugar. It is healthier due to it being fructose free, gluten free and lower in calories[15] .

Cassava is special due to its gluten free, no GMO, and low protein properties. This creates niche markets for cassava-based products, so there is no competition with substitute crops such as corn, wheat, rice and potato. There are buyers willing to pay a reasonable premium for organic cassava-based products (starch and flour), however the competition is fierce for these markets, and building a cassava organic compliance system is a costly and time-consuming process for communities or small and medium enterprises. For organic cassava starch alone, the demand has increased 1000 times over 10 years, from 60 metric tons in 2007 to 60,000 metric tons in 2017[16] .

The prospects for the cassava trade are favourable, as cassava still competes with corn and other substitute crops as a source of starch. In China and the Asian region there is a carbohydrate shortage, which is alleviated by a well-functioning cassava regional supply chain. The removal of price subsidies has reduced the price of Chinese corn and depressed the price of imported cassava in past years, but the effect will subside in the future. In the EU, potato starch has benefited from considerable institutional support, and it has a loyal customer base among paper and food producers, so they are highly protected. The future of cassava therefore depends on its ability to maintain its competitiveness with corn and other substitute starchy crops grown in different areas in the world, in terms of starch quality, cost, special properties and reliable supply.

2. Vision

The policy aims to build sustainable cassava production for processing quality products and for competitive access to markets.

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[11] Elijah Ige Ohimain (2014) The prospects and challenges of cassava inclusion in wheat bread policy in Nigeria, Industrial and Food Policy Research Unit, Department of Biological Sciences, Faculty of Science, Niger Delta University.

[12] http://www.cassavabiz.org/postharvest/lvstock_1.htm

[13] Akhmad Zainal Abidin (2013) Development of Wet Noodles Based on Cassava Flour, Bandung Institute of Technology.

[14] Agence France-Presse (2017) 'Beyond barley: Cassava beer creating a buzz in the market'.

[15] Madhava, Organic Cassava, downloaded from www.madhavasweenteners.com.

[16] Centre for Management Technology, 7th Starch World Asia, 23-25 January 2018, Siem Reap, Cambodia.

3. Goals and objectives

This policy aims to position Cambodia to be a home of cassava processing industries and a reliable supplier of cassava-based products for global markets.

To achieve this goal, this policy defines three main objectives:

- To transform from subsistence to commercial cassava production, where the profitability of farmers is enhanced to generate incomes in the context of price volatility, sustainable land use and climate-smart agriculture
- To support active processors and attract investment to produce value added cassava-based products to supply diverse markets
- To enhance trade competitiveness by turning from market access to market presence, im proving trade facilitation and reducing trade-related costs.

4. Strategies to achieve objectives

The policy adopts a three-pronged approach, where all streams of the cassava value chain are developed simultaneously within a single-sector platform:

4.1. Production strategy: Markets are identified first and then the supply chain is organized accordingly. The primary actors such as farmers and processors are brokered to work together through contract farming, outgrowing schemes and applicable supply chain mechanisms. Value chain development strategies are developed, and investment plans are aligned between value chain actors within their areas to optimize chain efficiency. Targets are set, for example, crop calendar, yield improvement, cost reduction, and quality assurance. Public investment (the government and development partners) target development where the private sector has made investments and farmers cultivate cassava.

4.2. Processing strategy: Upgrading existing processors and attracting investment at the right economic scale is a starting point to transform the sector and move up cassava value chains. Cassava processing industries shall have the same or almost equal capacity as foreign processors to produce products at a competitive cost, extract all value in cassava roots, and utilize technologies to manage pollution.

Cassava processing industries will link with related sectors to activate the development of circular economies that mutually benefit the private sector and local communities. Cassava residues can mix with other crops including corn, broken rice – primarily for energy (calories) – soybean meal, fish meal – for protein – as well as a variety of other ingredients to produce animal feed for local livestock as an additional opportunity for import substitution. Based on statistics from the International Trade Centre (ITC), Cambodia imported approximately US$63 million worth of animal feed in 2016, primarily from Thailand and Vietnam. Residues can also be transformed into fertilizers to supply agricultural input markets or sell

directly to farmers at a lower cost than imported fertilizers. Wastewater can be converted into organic liquid fertilizers to irrigate nearby farms, and biogas can be converted into heat to dry cassava starch and electricity to run factories. In Thailand, unused water and the remaining electricity of starch or ethanol factories is given or sold to communities at a cheap price as incentives to supply back their cassava. On the other hand, as cassava contains high hydrogen cyanide (HCN), contamination shall be managed and controlled at all processing stages to protect agricultural ecology, biodiversity and the welfare of communities.

4.3. Export strategy: Cassava is a sensitive crop, and farmers shift to grow other crops when the profit outlook is not attractive, and the market is not promising. Enhancing farmers' profitability, particularly for those living in suitable cassava production areas, is a priority to sustain their livelihoods and support the long-term business plan of processing industries.

Cassava commercialization will be accompanied by research and development, and development of the local production system. Production issues resulting in economic losses will be addressed, such as diseases, insects, pests, unsustainable agronomic practices, soil erosion, use of unhealthy planting materials, and the effects of climate change. As labor costs keep increasing and most rural areas face issues of labor deficiency, agricultural mechanization will be promoted to replace labour-intensive work. Input markets will be upgraded by raising awareness and setting responsibilities for input suppliers to source and supply quality products and instruct their clients on the right use or application of products for safety and effectiveness. Financial schemes will be innovated towards livelihoods of smallholder farmers by aligning them with the calendar of cassava production, safeguarding them to avoid distress sale situations, and promoting productive use of loans.

5. Activity plan

To achieve the policy vision, goal, and objectives, actions shall be taken as follows:

5.1. Establishment of implementing mechanisms

To effectively implement this policy, the sector governance structure is required to run, facilitate and manage diverse and complex interactions among stakeholders to address shortcomings and develop the sector in a sustainable manner. Existing bodies/institutions/agencies are assigned to be responsible for relevant duties within their mandates, and human resources are appointed as deemed appropriate and essential to perform tasks. To implement this policy successfully, mechanisms shall be established as follows:

5.1.1. The Cassava Working Group established by the Ministry of Commerce (MoC) through a Prakas dated 16 November 2017 will transform into a formal Working Group of the G-PSF. The Working Group will have a Secretariat residing at MoC.

5.1.2. A think tank housing market intelligence, data collection, and value chain/trade competitiveness analysis will be created.

5.1.3. A Product Development and Innovation Centre will be established to research, trial and develop new products which have high value and meet market demands.

5.1.4. The capacity of the Cambodia Agriculture Research Development Institute (CARDI) and research stations will improve to allow for the research and breeding of new cassava varieties with high starch content and high quality, and support farmers to adopt climate smart and sustainable agronomic practices. Moreover, the Ministry of Agriculture, Forestry and Fisheries will create reliable cassava supply chains for processing industries.

5.2. Legal framework

The policy implementation shall comply with the laws and legal frameworks which are available and in place. Ministries/agencies of the Royal Government of Cambodia can create new laws and regulations for cassava as deemed necessary and needed.

5.3. Finance

The Ministry of Economy and Finance (MEF) and National Bank of Cambodia shall be responsible for addressing issues related to financing according to the vision of this policy document. Simultaneously, finance also can mobilize from development partners, private sector, and other legal sources.

5.4. Human resource development

Human resources are a key asset to achieve the policy vision and its successful implementation. The Institute of Standards of Cambodia (ISC), Trade Training and Research Institute (TTRI) and Cambodian Agricultural Research and Development Institute (CARDI) will conduct training to improve the skills and productivity of laborers, create product standards as needed, and enable access to new knowledge through study tours, conferences, and field work.

5.5. Infrastructure

In tandem with the streamlining of international logistics and Cambodia's integration into regional and global economies vis a vis in response to actual needs of the cassava sector, infrastructure related to cassava shall put into high consideration:

5.5.1. Harmonizing and aligning the Logistic Master Plan and this policy with a focus on port upgrading, effectiveness of logistics services, trade facilitation and storage.

5.5.2. Examining the possibility of building strategic short-cut roads to decrease the distance from processing industries to ports/export routes and/or connecting to national transport routes (in-land, railways and waterways).

5.5.3. Examining the possibility of building public infrastructure directly reinforcing private infrastructure in order to effectively manage waste and environmental pollution as outlined in environmental laws and regulations. Waste from processing industries will be transformed into a wide range of products benefitting local communities.

5.6. Policy implementation

As cassava development is linked to the whole agricultural sector and trade platform, the policy will align this sector with national strategies and related sectoral policies to complement each other for development effectiveness. Cross-cutting areas such as transportation, logistics, finance, electricity costs, trade facilitation, trade support facilities and skilled labour are addressed in an integrated development framework. The National Cassava Policy is an exemplary case which is consistent and harmonized with policies and strategies such as the new Rectangular Strategy, National Strategic Development Plan, Industrial Development Policy, Cambodia's Diagnostic Trade Integration Strategy, Logistical Master Plan, Agriculture and Water Strategy, and Rice Export Policy.

Related ministries/agencies will continue to implement trade-related reforms to remove unnecessary costs, maintain key advantages, and create additional value to enhance sector competitiveness, resulting in turning market access into market presence. At the same time, the adoption and implementation of policy measures will enhance the profitability of value chain actors, especially farmers and processors, through raising individual productivity and connecting them with related forward and backward sectors to optimize the efficiency of selected cassava value chains. Therefore, the price of cassava-based products is in line with international prices, while quality requirements are met at a cost where value chain actors can make a profit.

To promote sector development at a desirable speed, responsible ministries, in cooperation with development partners, will design and implement projects which fill gaps in private sector and farmers' investments. The cooperation shall be done using the model of Producer Private Public Partnership so that resources are used strategically, and functions are performed accordingly to achieve common and individual goals.

As the cassava price is volatile, the value chain will be developed by building profitability on the lowest price recorded in previous years. Profitability is achieved by enhancing individual actors' productivity, promoting vertical and horizontal links to address value chain inefficiencies, and building an effective system to synchronize this sector with cross-cutting sectors to heighten mutual benefit.

5.6.1. Five-year action plan

A. ***Productivity of cassava production in Cambodia is increased by yield improvement and cost reduction without putting the agricultural ecosystem at risk (for two years) and the value chain competitiveness is enhanced to support farmers' incomes and growth of processing industries (for three years)***[17]:

A.1. MAFF conducts surveys on cassava planting areas regularly to record production size, identify areas, track soil fertility and monitor production costs. Based on these surveys, a cassava belt shall be developed to encourage farmers to use only suitable land for cassava cultivation, to make the belt viable, and to achieve substantial environmental and socio-economic benefits. The cassava belt is regarded as a zoning tool to promote and manage sustainable cultivation of appropriate cassava varieties that match soil quality and fit processors' product specifications.

A.2. MAFF, through the Provincial Departments of Agriculture, keeps track of the circulation of cassava planting materials imported from foreign countries. It checks quality and assesses health and cleanliness to protect and prevent the spread of disease in the country, and to mitigate possible economic losses for the sector. Detected threats shall be addressed with strict sanitary and phytosanitary (SPS) measures and through existing control mechanisms.

A.3. MAFF shall negotiate with governments in the region, international research centres and/or institutes, to import high yield, disease resistant, drought tolerant cassava varieties to test in Cambodia, and then distribute to farmers if they fit Cambodia's climate and soil conditions.

A.4. MAFF promotes commercial cassava nurseries and privately-owned multiplication centres to produce and distribute healthy planting materials with correct varieties that align with farmers' land.

A.5. MAFF shall check, monitor and assess the quality of agricultural inputs (fertilizers, etc.) being applied to cassava to ensure their effect on yield improvement and their compatibility with soil conditions, so that it is worth farmers' investments.

A.6. MAFF shall track, monitor and inspect pests, diseases, weeds and other adverse factors affecting cassava production. Identified threats and risks shall be managed and mitigated through proactive measures to avoid economic losses. Communication and outreach through media shall be created to disseminate information to farmers, processors and related stakeholders.

A.7. MAFF shall provide extension services whereby cassava-smart climate change adaptation and good agriculture practices are mainstreamed to farmers. New technologies and techniques, which are cost effective and suitable for farmers to raise their productivity, shall be explored, experimented and disseminated.

A.8. MAFF promotes effective land use and soil management for cassava production through crop rotation, alternative crops, and cover crops.

A.9. MAFF shall improve private agriculture services by organizing those owning agricultural machinery or equipment into groups (formal or informal) to raise their productivity and improve service quality. MAFF shall train them on soft and technical on-farm related skills so that their work complies with sustainable agronomic practices, resulting in yield increases at a manageable cost.

A.10. MAFF shall organize cassava farmers into producer groups, clusters or cooperatives, and integrate these formal and informal groups into a collective structure in accordance with their geographical areas, socio-economic context and willingness, as a point of channelling extension services, disseminating market information and linking with private processors through contract farming.

A.11. Early in the production season of each year, MAFF shall organize a "Cassava Day" to identify and award champion farmers who display entrepreneurship and act as role models to inspire others, and to disseminate updated agronomic practices, new techniques and technologies to farmers.

B. Develop a proactive private sector by assisting them to reach economies of scale and reducing business costs so that they can compete for market penetration:

B.1. MoC shall analyse and update the cassava value chain regularly by looking at market trends, regional competition, and cost structures in Cambodia. The studies provide evidence-based inputs for policy discussion so policy measures can be modified or added by related ministries or institutions to promote smooth sector development.

B.2. MAFF and The Committee on Economic and Financial Policies of MEF shall formulate a cassava investment strategy and carry out activities to attract investors so that processing capacity increases as needed to achieve export targets. Critical sector information and cassava investment guidelines shall be made ready and accessible through convenient and effective media.

B.3. The Ministry of Economy and Finance (MEF) shall provide incentives to processors and exporters exporting cassava-based products formally, and whose businesses provide direct benefits to farmers through tax exemptions or reductions, such as income tax and value added taxes.

B.4. MEF and the Agriculture and Rural Development Bank of Cambodia shall create a special budget package to intervene on overharvesting/supply glut, temporary closure of border check points with neighbouring countries, international market disruption, natural disasters, and other unprecedented events to lessen the deprivation of farmers and processors.

B.5. The Ministry of Mines and Energy (MME), especially Electricite du Cambodge (EDC), shall prioritize and accelerate the reduction of electricity costs and securing reliable supply for cassava processing factories. As cassava wastewater can generate biogas and be transformed into electricity, MME shall encourage cassava processors to invest in biogas facilities by supporting legal procedures, granting permits, and complying with requirements, as well as buying back remaining electricity at a reasonable rate or allowing its sale directly to nearby households at the same rates as local private and/or state suppliers.

B.6. The Ministry of Environment (MoE) and related ministries shall promote and facilitate the process of social and environmental impact assessments for cassava processing projects. This intends to ensure that suggested measures in the report respond to the challenge of waste and pollution management and impacts on health and welfare of people residing in processing sites or downstream areas.

B.7. MoE and the Ministry of Industry, Science, Technology and Innovation shall assist cassava-processing factories to adopt technologies to manage pollution from processing and create value from waste to ensure the minimum effect on communities, ecology and biodiversity. MoE shall set a clear procedure and guidelines for selecting processing sites in line with the cassava investment strategy of the Council for the Development of Cambodia to ensure that sites are not located in residential areas, sanctuaries, sensitive and/or protected areas, and are at least 40km from other sites.

[17] For detailed activities of the short and medium terms, please refers to Annex 1

B.8. MoC shall organize the private sector, including exporters and processors involved in cassava businesses, by creating a national business association and guide this association to register with MoI as per legal requirement.

B.9. Every two years, MoC shall organize a cassava conference/business forum to promote Cambodia's cassava-based products and connect the private sector to international business networks.

B.10. MoC shall create a business-to-business online platform to connect the Cambodian private sector with foreign buyers, and as a sector portal to share cassava information. This can be handed over to the cassava business association to manage and run.

B.11. MoC shall negotiate with the governments of targeted export countries on tax exemptions and reductions and trade facilitation to ensure a smooth export process from Cambodia. MoC shall also facilitate trade deals if a government-to-government arrangement is required or preferred.

B.12. MAFF shall negotiate with the governments of targeted export countries to remove SPS barriers and where necessary SPS get protocols signed and mobilize support to build the capacity of SPS compliance for Cambodian exporters and related stakeholders. SPS services will be scaled up and expanded based on national and international legal frameworks. MAFF will open opportunities and encourage the private sector to provide SPS related services.

B.13. The Institute of Standards of Cambodia of MME shall create, and update product standards as needed to promote Cambodian cassava-based products and support cassava processors to get SPS and/or quality certificates required by markets/buyers.

B.14. The National Bank of Cambodia shall review current financial schemes (loans) that micro finance institutions (MFIs) or commercial banks are lending to farmers and the private sector. This is to identify shortcomings and to innovate new schemes that are aligned to the livelihoods of cassava farmers, while at the same time promote the productive use of loans.

C. Infrastructures are built to enable the cassava value chain system to function in accordance with market-based production frameworks and link with related sectors where additional values are created and distributed in rural economies:

C.1. The Ministry of Rural Development and Sub-National Administrations (SNAs) with cassava production in their administrative areas shall include cassava in their strategic development and investment plans, and cooperate with local communities to match funds to build and improve roads for year-round access to farms.

C.2. MEF shall encourage and cooperate with the private sector to build critical facilities to reduce and/or retain economic losses during harvest and post-harvest, i.e. small-scale silos, collective storage, cassava banks or multiple purpose centres at strategic production and processing sites.

C.3. MAFF, the Ministry of Water Resources and Meteorology, the Ministry of Rural Development, the Ministry of Environment, and SNAs shall develop small-scale infrastructures to assist farmers to adapt to climate change in affected and sensitive areas and build their resilience. These include water reservoirs, small-scale irrigation, drip systems, etc.

C.4. The Ministry of Public Works and Transport (MPWT), MAFF and MoC will negotiate and cooperate with the governments of neighbouring countries to define/set a clear procedure for smooth and predictable trans-shipment of Cambodia's products, especially for cassava, through their ports.

C.5. MPWT shall accelerate the completion of the construction of railroads and link them to key cassava processing areas, so that cassava-based products can be transported by this means. MPWT shall set a supporting price which significantly contributes to reducing the cost of transporting cassava-based products.

C.6. MPWT, related ministries and SNAs (competent authorities at ports or border check points) shall set a procedure to offer special treatment to cassava-based products, as with rice, when they arrive at ports, such as, but not limited to, fee reductions for all related services, prompt clearance, warehousing, and lift-on lift-off facilities.

C.7. The Ministry of Interior, MoC, related ministries and SNAs shall create a working group within their administrative areas to check, monitor and address abnormalities and complaints, including unfair treatment, immoral practices, cheating, probes, unofficial fees, etc.

C.8. MoE, the Ministry of Industry, Science, Technology and Innovation and sub-national administrations shall monitor closely the performance of all processing centres and factories on environmental management and risk mitigation.

C.9. MAFF shall raise the productivity of rural labourers through on-farm and off-farm training to improve their performance, service quality and effective application of agricultural techniques.

5.6.2. Ten-year action plan

Sector competitiveness is driven by effective producer private public partnerships to trans form the sector into deep processing industries

D.1. MoC, in cooperation with the private sector, shall create a market intelligence unit to track markets and provide strategic inputs to the steering committee, line ministries, and value chain actors to create a long-term sector development roadmap.

D.2. MAFF and related ministries shall cooperate with development partners and countries in the region to set up a research and development centre to improve and ensure sustainable cassava production, particularly to breed new cassava varieties that suit Cambodian agricultural ecological contexts and target markets, and develop innovations to lower cassava production costs and raise farming productivity.

D.3. MoC and the Ministry of Industry, Science, Technology and Innovation in cooperation with the private sector, shall set up a product development and innovation centre to research and develop new products which give cassava a competitive advantage and which are marketable; and transfer knowhow to the private sector in accordance with intellectual property laws and existing legal frameworks.

D.4. MPWT, MRD, and SNAs shall build strategic roads to decrease the distance from processing sites to the country's ports as a way to reduce transportation costs.

D.5. MPWT, MEF, and private sector shall cooperate to modernize logistic services and examine the possibility to enlarge the scope and capacity of existing ports and build additional ports/ open export routes in order to shorten time and reduce transport costs.

D.6. MME, the Supreme National Economic Council (SNEC) and related ministries shall conduct an impact assessment on economic returns from blending cassava-based ethanol into gasoline. This assumes that the importation of gasoline can be reduced to an extent by the replacement of locally processed ethanol. Learning from global experience to gain support from consumers, gasohol will be cheaper than gasoline and work well in machines and currently operating vehicles. An ethanol-based cassava policy will be developed if the findings are economically substantial, viable for implementation by the private sector, and new fuel products are accepted and supported by market agents and consumers.

D.7. SNEC, MoC, CDC and related ministries shall study the economic returns of creating a special cassava processing zone as a model which can be replicated for other crops. The concept is to set up a zone surrounded by a cassava plantation/belt for processing cassava into a range of products within one place. The process is simplified by getting fresh roots from farmers to process into native starch, then into modified starch, and finally into end products. Creating this processing zone shall create substantial economic value for rural economies and manage pollution at a single location. This is cost effective, as energy generated from waste can be used for all processing industries. The production line is short, and this can save backward and forward costs of moving materials to be processed in different places.

D.8. MAFF shall consider developing a sector that focuses on animal meat and processed meat products for export. The whole agriculture value chain within Cambodia shall be integrated, starting from producing key commodity ingredients of animal feed (cassava, corn, rice or even soy), then producing animal feed, developing animal farms, and finally exporting slaughtered meat or even exporting meat products processed in Cambodia.

5.7. Risk management

Cassava has been labelled mythically as a crop of soil erosion. Like other starchy crops, cassava absorbs a large amount of nutrients to produce high yield, so soil erosion can be caused from mono-cropping and improper agronomic practices over years[18] . As such, soil health and fertility will be maintained through sustainable land use and smart agricultural practices. Extension service systems will be developed and improved to reach, train and support cassava farmers to use their soil efficiently and sustainably.

Cambodia and the rest of Asia no longer enjoy a disease - and pest - free environment. Over the last few years, several pests and diseases, such as cassava mosaic disease, witches broom, cassava bacterial blight, cassava mealybug, green spider mite, and others have been identified in some areas of the country. The emerging threats will be managed diligently and mitigated proactively to avoid present and future economic losses, and especially a large-scale spread which is consequently uncontrollable and unstoppable at later stages. Cambodia shall cooperate with countries in the region and global research institutes to mitigate these risks.

The lack of knowledge on proper use of agricultural inputs and chemical fertilizers, and environmental protection measures can potentially affect biodiversity, soil environment, and water. Therefore, there shall be effective protection measures in place and put attentions on these matters. Responsible institutions shall furnish comprehensive information to enterprises, companies, and farmers about the proper application of agricultural inputs and chemical fertilizers and have a concrete environmental management plan to mitigate negative impacts on human, animal and environment.

The cassava price is highly volatile on international markets and unpredictable in Cambodia. It is influenced directly by demand and supply, substitution of alternative carbohydrate crops and the policies of importing countries. Cassava production in Cambodia is not manageable and is sensitive to price, as farmers shift to grow higher-priced speculative crops. As such, cassava will be promoted as a strategic crop whose profitability at the farm level is enhanced and where the market is secured through contract farming.

Promoting the direct export of cassava-based products from Cambodia faces serious competition from neighbouring countries that have dominated local cassava production and global markets for a long time. Having highly competitive trade, countries can speculate the price or set a price that makes export from a country's trade routes unviable. Enhancing trade competitiveness requires effective producer private public partnerships where available resources are used effectively and there is direct support from the government.

On the other hand, products from Cambodia shall be the same price and quality, while trade conditions shall be attractive. These conditions challenge the Cambodian private sector, as most are informal, family-owned and small, nonprofessional businesses that are not efficient, have limited working capital, have no product quality assurance, and use out-of-date technologies and equipment. In addition to enhanced trade competitiveness, upgrading small and medium enterprises to reach international business standards and attracting large-scale investment with business knowhow and export readiness are the immediate development priorities.

Cassava processing can contaminate environment, especially water pollution causing from the release of million cubic meters of liquid waste per day vis a vis bad odour from wastewater, pulp and peel. In case that private and public environmental management infrastructure at cassava processing sites does not exist, responsible institutions shall ensure that environmental management facilities and processing factories shall be completed at the same time. Processing factories can collocate within a special zone to minimize investment cost on infrastructure by sharing the use of the same facilities. Responsible agencies shall encourage and support factories to process wastes into valuable products or energy which can benefit agricultural communities, factories themselves, and symbiotic industries etc.

[18] UNDP, MoC and CIAT 2017, Cassava: Facts and Fictions, downloaded from http://www.kh.undp.org/content/dam/cambodia/docs/UpgradingValueChain/Fatsheet_V3.pdf

6. Policy monitoring and evaluation

To implement the policy effectively, a monitoring system will be established to monitor, track and assess ongoing progress and results as follows:

- Policy goal and objectives
- Indicators against the action plan
- Policy progress reports
- Report against development outcomes (baseline/end line targets)
- Policy mid-term review
- Policy evaluation

The Committee on Economic and Financial Policies of MEF shall be responsible for monitoring, evaluation and coordination at the policy level to ensure the consistency and alignment of this policy with other policies and strategies.

Monitoring officers of the Secretariat of the Cassava Working Group will be senior and/or monitoring and evaluation (M&E) experts of each responsible ministry/agency or those who can participate in all activities, have expertise, and can provide critically constructive comments/insight as well as inputs to the strategy and action plan. The Secretariat shall formulate a M&E plan which defines SMART indicators, methodologies, data collection, means of verification, and report which can provide updates to the Chairman of the Cassava Working Group and/or line ministries/agencies as requested or deemed necessary. The Secretariat is able to recruit M&E consultants/experts to craft a M&E plan and facilitate monitoring activities.

7. Conclusion

The successful implementation of this policy can transform cassava into a profitable crop for smallholder farmers and a source of industrial development in Cambodia. To start the transformation process, commercialization of cassava production and agri-business development will be done at the same time to enhance the competitiveness of cassava grown and processed in Cambodia against substitute crops/products from other areas of the world. The competitiveness builds in the profitability of value chain actors in the context of price volatility.

Realizing the competitiveness of the cassava sector, the policy sets a vision and lays out measures to support active farmers, processors, exporters and operators. Therefore, upgrading existing processors and attracting investment to build advanced state-of-the-art factories, addressing cassava production issues, and improving business enabling environments could raise overall sector competitiveness.

The effective implementation of the above policy measures will lead to the achievement of the aforementioned goals. This will consequently bring substantial economic gains to Cambodia, in line with its transition towards middle-income country status in the future.

Abbreviation

ARDB	Agricultural and Rural Development Bank
CDC	The Council the Development of Cambodia
ITC	International Trade Center
MAFF	Ministry of Agriculture Forestry and Fisheries
MEF	Ministry of Economy and Finance
MISTI	Ministry of Industry Science Technology and Innovation
MLVI	Ministry of Labour and Vocational Training
MME	Ministry of Mines and Energy
MoC	Ministry of Commerce
MoE	Ministry of Environment
MoI	Ministry of Interior
MoINFO	Ministry of Information
MPWT	Ministry of Public Works and Transport
NBC	National Bank of Cambodia
RUA	Royal University of Agriculture
SNAs	Sub-national Administration Human Resource Statute
SNEC	Supreme National Economic Council
TTRI	Institute Trade Training and Research

Glossary

Terminologies used in this national policy are defined as follows:

21st century crop	refers to a multi-beneficial crop which is responsive to the needs of developing countries, global economic trends, and climate change.
Agri-business crop	refers to the crops which are grown for commercial purposes.
Agriculture ecosystem	refers to the combination of plants, animals, and microorganisms that interact with each other in physical and chemical environments used by humans to produce food or raw materials to fulfil their needs.
Agronomy	refers to the science of soil management and plantation.
Cassava Agriculture Commercialization	refers to the process by which agriculture interacts with other sectors within an economy and its success depends on the conditions of those sectors.
Cassava belt	refers to a geographic location which is suitable for cassava production.

Cassava	refers to a plant storing a lot of starch in its roots that is resistant to climate change and can survive in less fertile soil. Its starch can be processed into many products and used as an ingredient in food, industry, and bioenergy. It has two cultivars (sweet and bitter varieties) originating in America and having spread into Asia and Europe.
Cassava starch	refers to starch extracted from cassava root. The extraction can use water to take away HCN or be achieved through the grinding of dry chips.
Commercial production	refers to production which can result in high income.
Competitive advantage	refers the ability of an individual or group to carry out an economic activity (such as making a specific product) more efficiently than another activity.
Compound annual growth rate	refers to the rate of return that would be required for an investment to grow from its beginning balance to its ending balance.
Dry chip	refers to a peeled chip or unpeeled chip made from cassava tubers.
Ethanol	refers to the liquid, which is transparent, colorless and odorless, and which is in the alcoholic classification and can be used for fuel, beverages, perfumes, etc.
Governance framework	refers to the structure of a government and reflect the interrelated relationships, factors, and other influences upon the institution
Harmonized system (HS)	refers to the classification method of goods used in the international trade system created by the Global Custom Organization.
Hydrogen Cyanide (HCN)	refers to a chemical substance which is colorless and odorless but poisonous and inflammable.
Marginal supplier	refers to the supplier that receives purchase orders once buyers do not have enough supply or cannot buy from other sources.
Market based production	refers to agricultural production which responds to market needs at quantity, quality, and price in order to offset the imbalance risk between demand and supply. The market needs to be analysed in advance to develop a production and harvesting plan.

Organic cassava starch	refers to the extraction of starch from organic cassava roots. To get organic starch, cassava production needs to comply with organic standards required by buyers/markets.
Precision agriculture	refers to digital technologies used to accurately offer what plants needs in order to reach high productivity.
Price taker	refers to a company that accepts the prevailing prices in the market of its products. Generally, they have no bargaining power or no influence in the market.
Producer Public Private Partnership	refers to a mechanism by which the public and private sector cooperate to solve bottleneck issues within value chains.
Profitability	refers to the ability to use existing resources to maximize profit.
Smart agriculture	refers to the technology revolution which enables agriculture to adapt with climate change in order to ensure food security and environment sustainability.
Smart cassava production	refers to the use of technologies to achieve high cassava yield by adapting to climate change to increase farmer income and supply markets.
Traditional agriculture	refers to agriculture that uses old techniques, traditional tools and dependence on nature and customs.
Value chain	refers to the combination of activities which are carried out by actors throughout production, processing and export.

Annex 1: Detailed Activities of the National Cassava Policy

Stage 1- Short-term (1-2 years): ***Productivity of cassava production in Cambodia is increased by yield improvement and cost reduction without putting the agricultural ecosystem at risk***

Sort-term actions	**Issues to be addressed**	**Causes**	**Policy measures**	**Responsible Institutions**
Enhancing productivity at farm level to increase farmers' income, cope with price volatility, and maintain downstream competitiveness	Yield decline	Soil fertility is not analysed, monitored and used properly based on scientific principles	1.1.1. Conduct regular soil surveys, track yields, and monitor farmers' land use practices	MAFF
			1.1.2. Define and promote only suitable areas for cassava production in accordance with sustainable practices and trade competitiveness	MAFF
		Knowledge products on cassava agronomic practices are not disseminated	1.1.3. Gather and document successful practices available in Cambodia and the region	MAFF
			1.1.4. Experiment with agronomic practices and disseminate to farmers through effective extension service systems	MAFF, MoInfo
			1.1.5. Train extension officers and local agents on agronomic practices and soil management related to cassava production	MAFF
			1.1.6. Authorize only professionally trained officers/local agents to deliver extension services to farmers	MAFF
			1.1.7. Map cassava cultivation areas, analyze production cost, and monitor agronomic practices in all cassava planting areas and update from time to time to ensure accuracy and effectiveness	MAFF

		Cassava varieties are not analyzed and promoted based on soil, climate, topography, geographical conditions or industrial needs	1.1.8. Identify cassava varieties grown in Cambodia and assess their yields and productivity	MAFF
			1.1.9. Promote commercial cassava nurseries and private multiplication farms to distribute healthy/clean planting materials	MAFF, Universities
			1.1.10. Identify and import the varieties returning high economic gains to farmers and meeting industrial.	MAFF
			1.1.11. Monitor and control the quality of imported planting materials and the circulation of cassava varieties between Cambodia and neighboring countries	MAFF
		Occurrences of pest and diseases affect the cassava productivity in some areas	1.1.12. Check, trace, monitor, and control pests, diseases and other factors affecting cassava productivity and their widespread	MAFF
			1.1.13. Set up surveillance and control mechanisms to manage and mitigate risks of factors affecting productivity	MAFF
			1.1.14. Update and develop specific legal frameworks and regulations to control and intervene on the wide spread of factors affecting productivity	MAFF
		Quality of input supplies are not reliable	1.1.15. Assess quality of related cassava agricultural inputs and ban those which do not meet quality standards	MAFF
			1.1.16. Train input suppliers to be secondary agents which can guide farmers to the right use of agricultural inputs	MAFF

			1.1.17. Mandate the instruction of input application in Khmer and have local contacts for seeking advice	MAFF
		Climate change affects the survival of cassava plants, growth and productivity, in addition to creating additional costs	1.1.18. Identify areas affected by climate change and analyze root causes and impacts on cassava farms	MAFF
			1.1.19. Develop a climate change adaptation plan for cassava farms in affected areas	MAFF, MoE
			1.1.20. Build infrastructures to minimize negative impacts resulting from climate change	MAFF
		Cassava cultivation depends on rainfall due to lack of irrigation system	1.1.21. Conduct research on low cost and efficient irrigation system for small scale cassava production	MAFF
			1.1.22. Pilot micro irrigation schemes suitable to small-scale cassava plantation	MAFF
			1.1.23. Design and test a loan scheme by which farmers can invest in irrigation for year-round cassava production and grow flexibly based on market needs	ARDB
	Rising cost of cassava production	Cost of agricultural inputs increases during the peak time (once they need to be used)	1.1.24. Develop an alternative financial support scheme which farmers in a group can purchase input supplies in advance	ARDB
		Most plots of cassava farms are small which tends not to be cost effective	1.1.25. Create collective land use mechanisms to minimize production costs, and increase effective use of production factors and household labor	MAFF, SNAs
			1.1.26. Assist committed farmers to expand their planting areas through securable land rent schemes (land issues)	MAFF

		Fees of agricultural services are not analyzed and managed	1.1.27. Analyze factors affecting the cost of agricultural services (comparison between individual and commercial services)	MAFF
			1.1.28. Organize agricultural service providers into groups or appropriate associations	MAFF
			1.1.29. Provide capacity building to improve their productivity and enhance service quality	MAFF
			1.1.30. Create online applications which farmers and service providers can agree and plan cassava production	MAFF, Private Sector
	Harvest and post-harvest loss are issues which have not been considered to date	Harvest and post-harvest loss caused by humans, nature and related factors are not analyzed	1.1.31. Study harvest and post-harvest loss on cassava and update as necessary/needed	MAFF, RUA
			1.1.32. Train farmers and related value actors to adopt practical measures to manage losses	MAFF
			1.1.33. Set up facilities/infrastructure which can be used or rented by farmers to manage product losses and address distress sale situations	MEF, ARDB
		Farming management skills is not introduced and no systematic support to train farmers	1.1.34. Train farmers, especially heads of farmer organizations, on farming entrepreneurship and financial management	ARDB
			1.1.35. Promote saving schemes and credit unions at community levels	NBC, ARDB
Enhancing regional value chain cooperation for mutual benefit (Cambodia and neighboring countries)	Exporting chips to neighboring countries is hindered by protectionism and technical barriers to trade	The quality of chips does not meet product standards	1.1.36. Train farmers on product quality management	MoC
			1.1.37. Search and create small machines suitable for households and local communities to process chips instead of manual chopping	MISTI, MoC

			1.1.38. Design small scale and mobile drying facilities for chip processing (to prevent rain damage)	MISTI, MoC
			1.1.39. Develop and update product standards, and monitor compliance of processors and traders	MISTI, MoC
		Cross-border trade is not favorable for Cambodian farmers and processors	1.1.40. Have a special support fund to intervene during supply glut, border closure due to harvesting time of neighboring countries, and unpredictable events	MEF, ARDB
Promoting export of processing products for value creation and market security	Cassava harvesting season is short, lasting for 4-5 months	Competition for roots is very serious during harvesting season which affects the operation of cassava processing industries (starch, ethanol)	1.1.41. Promote contract farming between farmers and processors to leverage mutual benefits	MAFF
	Processing industries is not well set up and developed to reach a competitive scale	Limited access to finance as they do not have adequate collaterals and there is a weak governance system	1.1.42. Develop entrepreneurship and improve business management for access to finance and development impact fund	NBC, MoC, ARDB
	Processing industries cannot create much value from the processing line	Because of limited finance, they could not receive benefits from advanced technologies to reduce costs and create more value from waste (residue, wastewater)	1.1.43. Create investment stimulation funds to assist local starch processors to improve their business, resulting in increased competitiveness	MEF, NBC, MISTI
			1.1.44. Provide technical support to local starch processors on access to new technologies and value creation	MISTI, MoC

	High electricity cost	Electricity is a major cost of cassava processing industries	1.1.45. Implement a strategic plan to provide a special electricity rate for all processors from 2019-2020, including cassava processing industries	MME
			1.1.46. Scale up and secure the supply of electricity to all processors, including cassava processing industries	MME
			1.1.47. Inform timely to all processors about repair, installment and maintenance works etc.	MME
	Limited access to market, research and innovation	Most starch and other processors have limited access to market information, and especially knowhow on modernizing factories and developing new products	1.1.48. Allocate budget for research and development on technology, knowhow and product development for cassava	MEF
			1.1.49. Create networks for local processors to access technology, mechanics engineering, and marketing companies or related global service providers	MoC
	High transportation cost	Distance from processing factories to the country port is far and the transport fee is more expensive than neighboring countries, making the cassava price higher	1.1.50. Negotiate with neighboring countries to set up clear procedures and create trade facilitation support to assure smooth transshipments of Cambodian products through their ports	MPWT
	Business related costs drive up the product price	Various taxes can drive up business and product costs, therefore some taxes will be removed or decreased	1.1.51. Reduce taxes or create exemptions to lower the product price as a way to enhance trade competitiveness and provide higher margins to processing industries	MEF

	Informal businesses disrupt and hinder the growth and smooth operation of formal and legally binding businesses	Unfair playing fields which benefit some groups, while seriously hurting and hindering those which are formal, moral and legally binding	1.1.52. Inspect and monitor informal business at borders and companies bypassing laws and/or whose actions result in damage to the Cambodian reputation and the government in the global market	MoC, MEF, MoI, SNAs
	Unofficial administrative costs have been collected at different points along the cassava value chain	Unofficial fees create additional costs and reduce profit margin of farmers, processors and exporters	1.1.53. Investigate, inspect and control malpractices which happen throughout the value chain	MAFF, MISTI, MOC, MoI, MEF, SNAs
	Trade facilitation is not well developed to meet the nature of cassava trading activities	Various supporting export documents are required which creates additional costs and consumes time for application and retrieval of the required documents from different institutions that have different practices	1.1.54. Create single window service offices at key trading and export areas to minimize cost and time to receive trade documents	Related ministries, SNAs
			1.1.55. Create a synchronized trade tool through which requests can be processed in advance and the reliability of service can be assured	MoC
			1.1.56. Identify new markets and negotiate with target countries for smooth trade arrangement and removal of unnecessary documents	MoC

Stage 2- Medium-term (3-5 years): ***Enhancing the value chain competitiveness for farmers' incomes and growth of processing industries***

Medium-term	**Priorities**	**Causes**	**Policy measures**	**Institutions**
Enhancing farmers' profitability by improving cassava production system and market linkage	Household debt and distress sale issues are addressed by access to special support schemes	Financial schemes are not designed based on the cassava crop calendar and most farmers run short on cash during production and/or harvest season. Most of them harvest before time and enter into unfair deals	1.2.1. Design a financial scheme which aligns with the cassava crop calendar and is based on smallholder farmers' livelihoods	NBC, ARDB
			1.2.2. Train farmers on profitability and financial management for farm investment	NBC, ARDB
			1.2.3. Create special financial schemes providing low interest rates to poor farmers or those living in areas with low soil fertility or that are climate sensitive and vulnerable	NBC, ARDB
			1.2.4. Develop a digital financial platform by which all aspects of cassava value chains are integrated and aligned to minimize cost and leverage mutual benefits for all actors	NBC, ARDB
	Supply chain is created to align with the needs of processing industries such as quality of raw materials, conformance of quantity and intake schedule	Cassava is grown once the price is viewed to be high in past years, so production is not stable. As such, the cassava production system is designed to operate to pro-operation of the processing industries	1.2.5. Create cassava belts for processing industries based on geographic locations, soil quality, environment, and logistics	MoC, MAFF, MISTI, SNAs
			1.2.6. Build roads at cassava plantations for year-round access or land use	MRD, SNAs
			1.2.7. Identify cassava varieties which can grow during different seasons as needed	MAFF
			1.2.8. Design and implement projects to support the private sector to fill gaps/address supply chain issues	MEF, MoC, MAFF

	Profitability of farmers is sustained through updated research and development	Productivity at farm level and production costs will be well managed to provide an acceptable profit margin for farmers	1.2.9. Create Research and Development Centers based on the nature of the cassava value chain	MAFF
			1.2.10. Improve cassava productivity based on a sustainable land use framework through effective and timely extension services	MAFF
	Productivity of rural labor will be improved to increase cost efficiency	As the labor market in rural areas are changing due to migration, the productivity of households and laborers will be improved to manage cost and raise farming efficiency	1.2.11. Conduct a skills needs assessment for the cassava sector and develop a labor market strategy for cassava	MAFF
			1.2.12. Organize private contracted or household labor into groups to improve productivity	MAFF
			1.2.13. Provide training to labor organizations to improve labor productivity/service quality	MAFF
	Supply chain structure is set up by organizing farmers into applicable collective mechanisms	Gathering farmers into appropriate farmer organizations is important to enhance their bargaining power for sourcing inputs, accessing agricultural services, and negotiating with buyers, as well as accessing low-cost finance	1.2.14. Conduct regular surveys on households to track income from farm and profitability	SNAs
			1.2.15. Organize farmers into organizations or appropriate mechanisms to build and enhance economic power	MAFF
			1.2.16. Provide capacity building or a start-up fund for farmer organizers to ensure operationalization	MAFF
			1.2.17. Provide technical support to farmer organizations to carry out development initiatives benefiting their members	MAFF

	Issues of trust between farmers and processors/exporters are addressed by a functioning intermediary mechanism and enabling environment	Market linkage will be promoted through contract farming or applicable mechanisms to leverage mutual benefits, minimize risks in production and markets, as well as	1.2.18. Provide technical support to private sector and farmer organizations	MAFF, MoC
			1.2.19. Design and test contract farming models and scale up successful ones	MAFF
			1.2.20. Create local mechanisms to support and ensure transparency and accountability of the contract farming parties	MAFF, MoC, MoI, SNAs
			1.2.21. Improve existing conflict resolution mechanisms to promote trust and ensure effectiveness of the contract farming laws and regulations	MAFF
Enhancing competitiveness at business to business level	Diversifying markets by diversifying cassava-based products	Once transformed into processed or end products, cassava has no pressure for urgent sale due to nonperishable nature, and less dependence on a single market	1.2.22. Develop an industrial development roadmap, especially for cassava	MISTI, MoC, MAFF
			1.2.23. Develop an investment attraction strategy for cassava processing industries	CDC
			1.2.24. Create a special support unit for investors looking for cassava related investment in Cambodia	MoC, MISTI, CDC
			1.2.25. Organize a cassava business and investment forum to attract investors	MOC, CDC
			1.2.26. Design and implement development projects to back-up private investments once their investment plans are approved	MEF, MoC, MAFF

			1.2.27. Support SMEs/communities to grow, process and export organic products for high premium, niche markets	MoC, MISTI, MAFF
	Cost of production factors of processing factories will be gradually reduced		1.2.28. Buy or allow processing factories to sell remaining factories to EDC or communities	MME
		Incentivizing private sector to generate electricity from waste	1.2.29. Provide licenses and commercial permissions to processing industries with electricity surplus	MME, EDC
	Building skilled labor needed by processing industries	Fees and costs to hire foreign experts or skilled labor to address issues at factories are costly and time consuming	1.2.30. Identify skills, professions and expertise required by the sector	MISTI, MLVT, MAFF
			1.2.31. Develop skill match between academic institutions and industrial sectors	MISTI
	Dynamic circular economies are promoted by linking related sectors within production and processing line	Cassava residues can mix with other agricultural residues to make high quality fertilizer and animal feed. Linking among agro-industries can create more value for those industries and provide cheap products to rural farmers	1.2.32. Create a strategic link between agro-industries, i.e. rice mill, cassava starch, animal feed, fertilizers, to create local circular economies	MoC, MAFF, MISTI
			1.2.33. Promote and attract secondary industries to process cassava residues with locally available materials into agricultural inputs for local communities	MoC, MAFF, MISTI
	Turning waste into profits while assuring there is no effect on communities, the environment and the ecosystem	As cassava processing produces harmful waste, environmental management will be put in place to ensure safety and zero negative effects	1.2.34. Identify and define suitable sites for cassava processing industries	MoE, MAFF, MoC, MISTI
			1.2.35. Create a guideline for investors to select sites for processing industries	MoE, MoC, CDC, MISTI

			1.2.36. Develop and document responsibilities required by laws, regulations and policies which processing industries will need to comply with	MoE
			1.2.37. Check, monitor and evaluate environmental management performance of cassava processing industries	MoE, MISTI, MoC, SNAs
			1.2.38. Reward and support starch processing industries complying with laws and capitalizing on benefits from environmental management, i.e. carbon credit, tax exemption, etc.	MoE, MEF, MISTI, MoC
Enhancing the sector competitiveness	Reducing costs of moving cassava-based products from Cambodia to other markets	Unofficial fees shall be eradicated	1.2.39. Investigate, inspect and control unofficial fees being collected throughout the chain process from production to processing and export of cassava	Related ministries, MISTI, MoC
	Logistical costs are reduced by having more infrastructure and leveraging economies of scale by connecting related sectors/ industries	Various factors contribute to high costs, especially cheap alternative transportation means (vessels), inefficient trucks, competition of trucks during harvesting season, costs of petroleum, road conditions, and productivity of transportation services	1.2.40. Create freight forwarder facilities at appropriate locations which enable transport of cassava-based products through railways	MPWT, MISTI, SNAs
			1.2.41. Improve efficiency of truck companies to lower transport costs	MPWT
			1.2.42. Construct short-cut roads to reduce distances, as available	MPWT
			1.2.43. Identify innovative transport means which are more cost efficient, i.e. inland water way, etc.	MPWT

	Trade facilitation is improved to reduce time and cost, and ensure reliability and predictability of service providers	Costs paid for required export documents and waiting time due to late or long processing are costs that add to product price	1.2.44. Develop a digital platform through which trade related documents can be processed and paid online	MoC, Related ministries
			1.2.45. Provide special treatment to cassava-based products for clearance and related services at ports, borders, and critical points, as practiced with rice	MPWT, Related ministries, Port, Authorities of border, MISTI, MoC,
			1.2.46. Build facilities/amenities needed to support the timely and prompt movement of cassava-based products at ports and logistics points	MPWT
	Barriers to trade will be addressed and advantages from trade preference treatment will be capitalized on	Export from Cambodia benefits from the no or low tariff rates granted by trade preferential treatment schemes, and these advantages will be capitalized on. Cambodia still benefits from the LDC despite its graduation to a lower-middle income country	1.2.47. Analyze cassava markets and negotiate with target countries for smooth trade arrangements	MoC
			1.2.48. Address trade barriers (SPS) between Cambodia and target countries	MAFF, MoC
			1.2.49. Promote Cambodia's cassava products to international and global markets through effective marketing strategies	MoC
	Trade finance is not yet well developed to support the growth of cassava processing and export industries	Lack of effective and well-designed trade finance hinders processors and exporters from increasing values and volume of trade as they cannot utilize extra finance as working capital	1.2.50. Develop trade finance schemes based on the needs of processing industries	NBC, ARDB
			1.2.51. Improve regulatory frameworks to enforce trade finance schemes	NBC, ARDB
			1.2.52. Provide direct loans to processing industries that have good performance records and a positive impact on farmers	NBC, ARDB

Long-term (5-10 years): ***Sector competitiveness is driven by effective producer private public partnerships to transform the sector into deep processing industries***

Priorities	Description	Rational	Actions	Responsible institutions
1.3.1. Ethanol policy	Ethanol distilling from cassava can be blended with imported gasoline at an acceptable rate to make gasohol	- Create jobs for Cambodian farmers - Reduce foreign exchange by reducing the volume of imported gasoline - Create jobs for local labor and reduce migration - Attract investment in ethanol factories - Reduce emission of CO2 and pollution - Create jobs for Cambodian farmers -Reduce imports of products, which consequently reduces trade deficit - Create jobs for local labor and reduce labor migration - Promote the growth of backward and forward industries - Integrate into regional and global supply chains by exporting semi or end products - Create jobs for farmers - Create cheap animal feed for local farmers - Reduce import of meats - Create value additions from the export of meat - Create more jobs within meat value chains	- Review global experiences on challenges and successes of ethanol blending policy - Analyze the competitiveness of Cambodian ethanol-based cassava and cost and benefit analysis for the Cambodian economy - Assess feasibility of implementing ethanol policies (customer behaviors - Develop roadmap and strategic development plan	SNEC, MME, MISTI

1.3.2. Establishing a special zone for processing cassava into various end products	A variety of products can be processed from cassava that are both in demand by domestic markets and can be exported	- Create jobs for Cambodian farmers -Reduce imports of products, which consequently reduces trade deficit - Create jobs for local labor and reduce labor migration - Promote the growth of backward and forward industries - Integrate into regional and global supply chains by exporting semi or end products	- Review the experience of developing agro-industrial clusters around the world - Conduct market analysis (including products/buyers Cambodia will produce/target) - Assess the feasibility of an agro-industrial cluster in Cambodia - Formulate a strategy and masterplan for an agro-industrial processing zone/industrial cluster	SNEC, MISTI, MoC, MAFF, CDC
1.3.3.Producing animal feed and exporting meat products to international markets	Cambodia will grow crops that have competitive advantages and import uncompetitive ones to produce cheap animal feed, promote commercial animal farms, attract global well-known processors, and develop supporting infrastructure for meat export	- Create jobs for farmers - Create cheap animal feed for local farmers - Reduce import of meats - Create value additions from the export of meat - Create more jobs within meat value chains	- Study the competitiveness of crops grown in Cambodia and identify crops that should be imported to produce cheap animal feed - Conduct market analysis (demands, product standards, trade barriers, and trade competitiveness) as well as the costs and benefits of developing agriculture based on animal feed and meat export - Formulate strategy and development plan	SNEC, MAFF

1.3.4. Research and Development has capacity to breed cassava varieties suited to Cambodia	A Research and Development Center breeds cassava varieties suited to the environment, that produce a high yield, are disease resistant, climate adaptable, and meet the needs of processing industries	- Increase yields and income of farmers - Make cassava competitive with substitute and competing crops -Create more value for processing industries	- Develop strategy for setting up a research and development center - Mobilize resources - Build capacity of staff - Research contributes to improving farming productivity	MAFF, Battambong University
1.3.5. Market Intelligence Unit	The Unit will act as a think-tank to analyze market needs, industrial evolution, and trend of grain production. It provides strategic recommendations and support on value chain development	- Market analysis and guidance to private sectors and strategic direction to the government	- Regular update of market trends - Strategic advice to the government and private sector	TTRI, private research institutes and experts
1.3.6. Product and Development Center	Research and product development can be operationalized by SMEs. It can be put in a business plan which is bankable by finance institutes	- Research products available in markets - New products are developed, tested and transferred to SMEs - Build capacity of private sector	- Develop a roadmap to create a product and development center - Mobilize resources and human capital to set up and operate the center - Provide effective services to private sector and agriculture communities	MISTI

Annex 2: Statistic tables

Table 1: Potential Products and Country Destination Markets for Cambodia Cassava Derivatives

Derivatives	World Imports in 2016	Key Importing Countries
Native Cassava Starch	$1.5/$2 billion	1.China 2.ASEAN: Indonesia, Malaysia, Philippines 3.India, Bangladesh 4.Selected EU countries
Modified Starch (all sources including cassava)	$3.0/$3.3 billion	1.China 2.US 3.EU 4.Other Asia: Japan, Korea, Indonesia 5.India
Starch Residues (all sources including cassava)	$1.6 billion	1.ASEAN: Indonesia 2.Other countries with demand for cassava residue for animal feed
Fresh Tubers/Roots and Dried Chips	$2.6 billion	1.Viet Nam 2.Thailand 3.China 4.Other ASEAN and other markets for chips used in Animal Feed in Animal Feed
Animal Feed	$14 billion	1.ASEAN: Thailand, Indonesia, Viet Nam 2.India 3.EU countries
Bioethanol	$2 billion	1.China 2.India 3.Korea 4.Viet Nam
Undenatured Ethyl Alcohol	$5 billion	
Tapioca Flakes, Grains, Siftings	$80 million	

Table 2: World Imports of Cassava "Native" Starch HS-110814

Top 10 Largest Importers of Cassava Starch HS-110814 Ranked by 2015 Value, US$ thousands							
Rank	Importers	Imported value in 2015	Share of 2015 world imports	Imported Value in 2016	2016 Quantities MT	2016 Unit Value $/MT	Average tariff in %
	World	$1,587,992	100.00%	$1,495,673	4,016,020	$372	
1	China	$781,261	49.20%	$729,075	2,073,084	$352	12.1
2	Indonesia	$256,425	16.15%	$226,637	630,127	$360	9.5
3	Taipei	$137,969	8.69%	$118,060	327,441	$361	8.6
4	Malaysia	$74,524	4.69%	$101,490	290,225	$350	0
5	USA	$69,772	4.39%	$62,919	96,060	$655	0.2
6	Japan	$57,893	3.65%	$48,095	130,833	$368	233.8
7	Philippines	$34,962	2.20%	$44,974	115,920	$388	19.4
8	Singapore	$27,038	1.70%	$23,947	61,150	$392	0
9	Bangladesh	$11,910	0.75%	N/A	N/A	N/A	10.3
10	Korea	$11,281	0.71%	$10,625	29,651	$358	438.1

Source: UNDP-Cambodia 2017, Cambodia's Cassava Export Market Strategy

Table 3: World Imports of "Modified" Starch HS-350510

Top 20 Largest Importers of Modified Starch HS-350510 In US$ thousands								
Rank	Importers	Imported Value in 2012	Imported Value in 2016	Quantity Imported in 2016 MT	Unit value $/MT	% Annual Growth in Quantity 2012-2016	% Share of World Imports	Average Tariff Applied by Country in %
	World	$ 3,570,386	$ 3,275,404	3,495,007	937	0	100	
1	China	$ 280,177	$ 375,574	363,499	1033	6	11.5	13.4
2	Japan	$ 444,088	$ 323,219	440,654	733	-5	9.9	6.7
3	Germany	$ 364,005	$ 305,412	330,382	924	-1	9.3	3.7
4	USA	$ 120,581	$ 168,305	95,872	1756	6	5.1	0.1
5	United Kingdom	$ 138,472	$ 126,113	132,506	952	1	3.9	3.7
6	France	$ 135,632	$ 119,257	117,318	1017	2	3.6	3.7
7	Korea, Republic of	$ 102,099	$ 95,109	108,309	878	-2	2.9	N/A
8	Indonesia	$ 124,458	$ 93,852	109,729	855	-9	2.9	4.8
9	Canada	$ 89,482	$ 93,291	92,728	1006	0	2.8	2
10	Russian Federation	$ 88,090	$ 88,386	87,126	1014	0	2.7	3.2
11	Netherlands	$ 102,810	$ 85,527	73,514	1163	-6	2.6	3.7
12	Finland	$ 128,287	$ 84,861	135,534	626	-5	2.6	3.7
13	Sweden	$ 112,765	$ 74,655	106,775	699	-5	2.3	3.7
14	Italy	$ 98,946	$ 73,516	78,875	932	-4	2.2	3.7
15	Turkey	$ 94,048	$ 71,386	106,478	670	-2	2.2	6.7
16	Spain	$ 67,157	$ 69,778	66,624	1047	6	2.1	3.7
17	Mexico	$ 63,533	$ 66,397	58,114	1143	2	2	4.2
18	Belgium	$ 64,849	$ 65,354	70,767	924	6	2	3.7
19	Poland	$ 75,706	$ 51,324	64,639	794	-5	1.6	3.7
20	Taipei	$ 54,299	$ 44,803	59,097	758	-2	1.4	10

Source: UNDP-Cambodia 2017, Cambodia's Cassava Export Market Strategy

Table 4: Global cassava starch market forecast for 2020-2025

Years	**Starch production volume (MMT)**	**Starch production value (Million US$)**
2020	7.1	3,368
2021	7.3	3,470
2022	7.4	3,567
2023	7.5	3,615
2024	7.7	3,650
2025	7.8	3,697

Source: IMARC Estimate, Report on Cassava Starch Market: Global Industry Trend, Share, Size, Growth and Opportunity

Annex 2: Statistic tables

Outcome	**Indicators**	**Baseline**	**Target**	**Means of verification**
Development outcome: the policy brings inclusive economic growth to Cambodia in the lower-middle-income country context and reinforces the Government's plan to become a high-middle-income country at a later stage	Contribution to national economic growth	Between 3-4 percent of GDP and approximately 900 million USD	USD 100 million is added to economy per annum	1). Baseline study 2). Mid-term review 3). End line survey or policy evaluation
	Contribution to poverty reduction	Poverty rate at 10 percent in 2018	1 percent of poverty reduction by 2023	
	Farmer household income (per hectare)	USD700 per hectare	Increase by 30 percent	
	Job creation (factories)	67 percent of people involve in agriculture	2000 jobs are created (for five years)	
Vision: the policy aims to position Cambodia to be a home of processing industries and a reliable supplier of cassava-based products for global markets	Private investment in cassava processing industries (million USD)	Current private investment is about $150 million (as of 2018)	Additional private investment for $200 million (for five years)	
	Public investments to support cassava production, processing and export of cassava	Public investment in cassava is estimated to be $200 million	Additional public investment for cassava is 220 (for five years)	
The policy aims to build sustainable cassava production for the processing of quality products and competitive access to markets	Value of cassava starch export from Cambodia	$25 million in 2017	$105 million in 2023	
	Quantity of cassava starch exports from Cambodia	70,000 metric tons in 2017	300,000 metric tons in 2023	

No.	Indicator	Baseline	Target	Number of beneficiaries					Total beneficiaries
				Year 1	Year 2	Year 3	Year 4	Year 5	
Objective 1: To transform from subsistence to commercial cassava production, where the profitability of farmers is enhanced to generate incomes in the context of price volatility, sustainable land use and climate-smart agriculture									
1.	Cassava yield increase while soil quality is maintained	20 tons per hectare	Yield increase by 30 percent	5%	10%	15%	20%	20%	70%
2.	Return from additional investment to improve cassava production is at a high rate	$ 600-800 per hectare (production cost)	Net profit increases between 20-30 percent						
3.	Retaining profit loss through effective harvest and post-harvest loss management	Profit loss is between 20-30 percent	Profit loss is reduced between 10-15 percent						
4.	Cassava production is set up for year-round harvesting	Current harvesting is between 5-6 months	Harvesting period should be 10 months	1,000 hectares	5,000 hectares	10,000 hectares	30,000 hectares	30,000 hectares	76,000 hectares
5.	Farmers are grouped into effective collective mechanisms	Number of agriculture cooperatives	Around 100	100	100	100	100	100	500
6.	Set up of agricultural machinery cooperatives	Number of cooperatives	None	20	20	20	20	20	100
7.	Quality of agriculture input supplies	Experiment and quality assurance of input supplies	Not yet systematic and realistic quality assurance plan	2 times per year	2 times per year	2 times per year	2 times per year	2 times per year	10 times

No.	Indicator	Baseline	Target	Number of beneficiaries					Total beneficiaries
				Year 1	Year 2	Year 3	Year 4	Year 5	
8.	Agronomic knowledge is transmitted to farmers	Traditional techniques transferred by informal networks	New techniques are transferred	5%	10%	15%	20%	20%	70%
9.	Innovation to adopt with climate change	Rain dependent production	Small scale irrigation	4 projects	4 projects	4 projects	4 projects	4 projects	20 projects
10.	Loan is granted based on the cassava seasonal calendar	Loan is not based on seasonal calendar	Loan based on seasonal calendar	4 banks	4 banks	4 banks	4 banks	4 banks	20 banks
11.	Linkage between farmers and processors (contract farming)	A few contract farming projects for cassava	Cassava contract farming projects	Two projects	Two projects	Two projects	Two projects	Two projects	10 projects (based on needs of processing factories)
12.	Available skilled workers	No formal training for agricultural laborers	Number of laborers trained	1,000	1,000	1,000	1,000	1,000	5,000
13.	Commercial agriculture land use initiatives	Informal land rental system is available	Formal land rental system which supports farmers to increase production	Two projects	Two projects	Two projects	Two projects	Two projects	Ten projects
14.	Agri tech/digital platforms are established and operated to connect stakeholders and improve coordination with cassava value chains	No specific platform for cassava (having block rice and agri-tech)	At least one agri-tech platform for cassava	1,000 users	2,000 users	6,000 users	10,000 users	14,000 users	23,000 users

No.	Indicator	Baseline	Target	Number of beneficiaries					Total beneficiaries
				Year 1	Year 2	Year 3	Year 4	Year 5	
Objective 2: To support active processors and attract investment to produce value added cassava-based products to supply diverse markets									
15.	Capacity improvement of existing processing factories, especially SMEs	Family-based and informal business (550 businesses)	Professional and standardized business companies	50	50	100	100	100	400
16.	Building more cassava-based processing factories	7 operating factories	17 factories (need 10 more factories)	1 factory	2 factories	2 factories	3 factories	2 factories	10 factories
17.	Cost of cassava-based products is competitive in the market	Production related cost is reduced (electricity, water, transportation, logistics, services at port, tax/VAT, interest rate, informal cost etc.)	Production cost is reduced	2%	2%	2%	4%	4%	14%
18.	Internal control mechanisms to manage the leakage of raw materials (cassava)	Purchase/import of neighboring countries influence the flow of cassava and consequently affect the production line of local factories	Supporting mechanisms are created to support private sector to manage supply chain	2 projects	5 projects	5 projects	3 projects	2 projects	17 projects
19.	Product quality infrastructure is improved and responsive to the needs of private sector	Relevant institutions have limited focus on the quality of cassava-based products	Capacity building and improvement of responsible institutions in charge of product quality control/assurance	Two projects (focusing on product standards, testing, calibration, certification, assessment/accreditation, as well as supporting private sector to improve their own quality control based on safety standards)					Two projects

No.	Indicator	Baseline	Target	Number of beneficiaries					Total beneficiaries
				Year 1	Year 2	Year 3	Year 4	Year 5	
20.	The Cassava Working Group under G-PSF is established. It can play roles such as market analysis, business matching, policy advocacy, and raising challenges to the government	An inter-ministerial working group is created by MoC's Prakas	A working group which is represented by the high level of related ministries to steer, implement and facilitate the policy implementation	One working group					One working group
21.	A National Cassava Business Association should be established to bring together the private sector for market development and capacity building	12 local cassava associations are created	National business association	1 Association					1 Association
22.	Initiatives to promote circular economies by linking related factories which can complement each other	There is a linkage between factories to process cassava residues but at a small scale	Circular economy projects are designed and implemented	2 projects (cassava residue processing and complementary projects)					2 projects
23.	Regular business promotion and investment attraction activities (all companies working in the cassava value chain)	One event, business and investment forum, organized in 2017	Business and investment forum		1 time		1 time		2 times

No.	Indicator	Baseline	Target	Number of beneficiaries					Total beneficiaries
				Year 1	Year 2	Year 3	Year 4	Year 5	
24.	Market access (connecting private sector and international markets)	Limited market information	Trade missions to target markets		1 time	1 time	1 time	1 time	4 times
25.	Cassava Production Research and Development Center	No specialized cassava center, only cassava production focused projects	An initiative to establish a cassava center or related projects	Two projects (can be centers or other activities which lead to improve cassava production in eastern and western regions)					Two projects
26.	Product development and innovation (cassava)	No specialized product development center	One project	One project to establish a specialized center					1 project
27.	Market information for agriculture products or an app is created via cooperation with consulting companies or experts	Individual access to market information and gathering	A focal market information app is created	1 application					1 project