Kingdom of Cambodia
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Royal Government of Cambodia

National Cassava Policy
2020-2025

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Prime Minister of the Kingdom of Cambodia

Forward

In the peaceful era, Cambodia has succeeded in moving from a Least Developing Country to a Low Middle-Income country. The achievement of stably high economic growth for many decades have substantially reduced poverty, downed to 10 percent in 2018 while expanded economic bases. Cambodia has connected with multiple global value chains and has been enhancing its potentials to be a regional centre of diverse products and services which it has competitive advantages and opportunities.

In tandem with the ongoing progress and long-term development visions, especially to be the High Middle-Income Country by 2030 and the High-Income Country by 2050, the policy focuses on economic based diversification which creates new businesses and simultaneously diversify existing vibrant economic activities. Among core economic sectors, agriculture has still played a pivotal role to sustain the economic growth and reinforce local economic development. The majority of households approximately 37 percent of the local labour force has been engaging in this sector and seamlessly worked on farms in accordance with the seasonal calendar including planting, processing, transporting and export.

Having realized the intertwin of agri-business development and rural livelihood improvement, particularly employment and job creation for rural labours, the Royal Government of Cambodia has imposed supporting measures integrating market demands, global value chains, and production system all into the single policy and action plan. From now onwards, cassava, the second crop after rice, shall receive special treatment in order to exploit its maximum benefits and transform it to be a dynamic agent for agro-industrial development in Cambodia which this target 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 among agriculture sub-sectors and with domestic industries.

On behalf of the Royal Government of Cambodia, I would like to congratulate and appreciate Ministry of Commerce; Ministry of Agriculture, Forestry and Fishery; Ministry of Economy and Finance; Ministry of Industry, Science, Technology and Innovation; related ministries; Development Partners, Private Sectors, Farmers, Research Institutes, and all relevant stakeholders for formulating this policy. Contribution such as finance, knowhow, technical assistance, information in respect with responsibility and commitment are priceless assets for this successful start-up phase vis a vis for implementation and monitoring phases.

Standing with successful experiences and lessons learned from the Policy on Promotion of Paddy Rice Production and Export of Milled Rice, I strongly belief that Cambodia will excite the world again with its supplying roles of cassava derived food and industrial inputs. I am optimistic that the achievement of the cassava policy shall bring prosperity to local economies leading to expand national economy and better-off 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 prime 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 this policy implementation.

2020

Hun Sen

Content

1.Introduction

The Royal Government of Cambodia (RGC) 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 to lower-middle-income country, the RGC sets robust commitments to diversify its economic bases, away from traditional sectors. This envisions a pathway to move up currently active and potential new value chains. Transforming from subsistent agricultural production to agro-industrial based development is one of the RGC'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.

Among many priorities, the RGC has realized the potential of cassava as a crop for resource-poor and/or smallholder farmers to improve their livelihoods, and as a source of industrial development. The bright prospects align with the rest of the world, which values cassava as a 21st century crop or the food of the 21st century.

Over decades, the RGC has kept abreast of the cassava evolution as the followings:

Miracle 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. Almost US$300 million has been invested each year to cultivate cassava over a planting area of 0.5 million ha, while export, mainly in the form of fresh roots and dry chips, is worth approximately US$728 million[2]. 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. Five out of ten starch processors are operating, while one new processing plant is underway. Two ethanol distillery plants close to the capital have operated for years.

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 Thailand and Vietnam as 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.

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

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, 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 stable 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[3]. 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[4].

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 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 southeast ASEAN 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[5]. 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 chip 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 shall be increased to reinforce this policy implementation[6].

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,

[3] ITC's trade map, data retrieved in March 2018.
[4] IMARC (2017) *Cassava Starch Market: Global Trends, Share, Size, Growth, Opportunity and Forecast 2017-23*, www.imarcgroup.com
[5] CIAT (2018) *Cassava markets: Value chains and livelihoods in Asia: When certainty is the only certainty*, Cotonou, Benin.
[6] Analysis: 'China's nationwide E10 Ethanol mandate faces hurdle', downloaded from https://www.patts.com/latest-news/agriculture/signapore/analysis-chinas-nationwide-e10-ethanol-mandate-26808971.

reaching a volume of 7.4 million tons by 2022[7]. It is being used in the production of sweeteners, 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 shall 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 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[8]. 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[9]. In Indonesia, research shows that cassava flour-based wet noodles are 80 percent like wheat flour noodles[10]. In Mozambique, cassava has been used to brew beer to replace the importation of barley[11]. 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[12].

Cassava is special due to it being gluten free, having no GMO, and low protein. 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 100 times over 10 years, from 60 metric tons in 2007 to 60,000 metric tons in 2017[13].

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

[7] IMARC (2017) *Cassava Starch Market: Global Trends, Share, Size, Growth, Opportunity and Forecast 2017-22*, www.imarcgroup.com.
[8] 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.
[9] http://www.cassavabiz.org/postharvest/lvstock_1.htm
[10] Akhmad Zainal Abidin (2013) *Development of Wet Noodles Based on Cassava Flour*, Bandung Institute of Technology.
[11] Agence France-Presse (2017) 'Beyond barley: Cassava beer creating a buzz in the market'.
[12] Madhava, Organic Cassava, downloaded from www.madhavasweenteners.com.
[13] Centre for Management Technology, 7th Starch World Asia, 23-25 January 2018, Siem Reap, Cambodia.

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.

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, improving 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. Market-based 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 shall 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 ect.–primarily for energy (calories)–soy bean 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. Waste water 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. Production 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 shall be accompanied by research and development, and development of the local production system. Production issues resulting in economic losses shall be addressed, such as diseases, insects, pests, unsustainable agronomic practices, soil erosion, use of unhealthy planting materials, and the effects of climate change. As labour costs keep increasing and most rural areas face issues of labour deficiency, agricultural mechanization shall be promoted to replace labour-intensive work. Input markets shall 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 shall be innovated towards pro-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 the followings:

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 development the sector in a sustainable manner. Existing bodies/institutions/agencies are assigned to be responsible for relevant duties within their mandates, and resource people are appointed and deemed appropriate and essential to perform tasks.

To implement this policy successfully, mechanisms shall be established as the followings:

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

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

5.1.3. A Product Development and Innovation Centre shall be established to research, trial and develop new products which having high value and meeting market demands.

5.1.4. The capacity of the Cambodia Agriculture Research Development Institute (CARDI) and research stations shall improve to research and breed new cassava varieties having high starch content and good quality, support farmers to adapt climate smart and sustainable agronomic practices. Moreover, MAFF shall create reliable cassava supply chain for processing industries.

5.2. Legal framework

The policy implementation shall comply with the laws and legal frameworks which are available 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

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

5.4. Human resource development

Human resource is a prime asset to achieve the policy vision and successful implementation. Institute of Standard Cambodia (ISC), Trade Trading and Research Institute (TTRI) and CARDI shall conduct training to improve skill and productivity of labours, create product standards as needed, and enable access to new knowledge through study tours, conferences and field works.

5.5. Infrastructure

In tandem with the streamline of international logistic 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. Harmonize and align the Logistic Master Plan and this policy with the focus on port upgrading, effectiveness of logistic services, trade facilitation and storage.

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

5.5.3. Examine the possibility of building public infrastructure directly reinforcing private infrastructure in order to effectively manage wastes and environmental pollution as set in environment laws and regulations. Wastes from processing industries shall process into a wide range of products benefitting to local communities.

5.6. Policy implementation

As cassava development is linked to the whole agricultural sector and trade platform, the policy shall align this sector with national strategies and related sector policies to complement and substitute each other for its 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 Cassava Policy is an exemplified 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 continue to implement its 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 shall enhance the profitability of value chain actors, especially farmers and processors, through raising individual productivity and connecting 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, designs and implements projects which fulfil 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 shall be developed by building profitability on the lowest price recorded in past years. The 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 raise 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 Enhancing the value chain competitiveness for farmers' incomes and growth of processing industries (for three years):

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 be 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 correct and consistent cassava varieties fitting soil quality and processors' product specifications.

A.2. MAFF, through 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 farmer investment.

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. Every year early in the production season, 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. Developing 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 carries out activities to attract investors so that processing capacity increases as needed to achieve export targets. Critical sector information and a cassava investment guideline 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, etc.

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

B.5. Ministry of Mines and Energy (MIME), especially Electricite Du Cambodge (EDC), shall prioritize and accelerate the reduction of electricity costs and secure reliable supply for cassava processing factories. As cassava waste water can generate biogas and be transformed into electricity, MIME 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. Ministry of Environment (MoE) and related ministries shall promote and facilitate the process of social and environmental impact assessment for cassava processing projects. This intents 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.

B.7. MoE and 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, the ecology and biodiversity. MoE shall set a clear procedure and guideline 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, habitat, sanctuary, sensitive and/or protected areas, and are at least 40km from other sites.

B.8. MoC shall organize the private sector, including exporters and processors involved in the cassava business by creating a national business association. A law on the roles, functions and authority of business associations in general shall be developed to promote the active role of the private sector in Cambodian socio-economic development.

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 the 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 get SPS protocols signed and mobilize support to build the capacity of SPS compliance for Cambodian exporters and related stakeholders. SPS services shall be scaled up and expanded based on national and international legal frameworks. MAFF encourage and open for private sectors to provide SPS related services.
B.13. The Institute of Standards Cambodia of MIME 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. 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, Ministry of Water Resources and Meteorology, 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 shall 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 its administrative areas to check, monitor and address abnormalities and complaints, including unfair treatment, immoral practices, cheating, probes, unofficial fees, etc.
C.8. MoE 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 transform 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, 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. MIME, 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 shall be cheaper than gasoline and work well in machines and currently operating vehicles. An ethanol-based cassava policy shall be developed if the findings are economically substantial, viable 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 role 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 simple, 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 spot. 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[14]. As such, soil health and fertility shall be maintained through sustainable land use and smart agricultural practices. Extension service systems shall 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 in the country. The emerging threats shall 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 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 shall be promoted as a strategic crop whose profitability at the farm 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, unprofessional 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 know how and export readiness are the immediate development priorities.

6. Policy monitoring and evaluation

To implement the policy effectively, a monitoring system shall be established to monitor, track and assess on-going progress and results as the following:

- 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

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

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 shall be senior and/or 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 strategy and action plan. The Secretariat shall formulate a M&E plan which define SMART indicators, methodologies, data collection, means of verification, and report which can provide update to the Chairman of the Cassava Working Group and/or line ministries/agencies as per request 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 shall be done at the same time to enhance the competitiveness of cassava grown and processed in Cambodia against substitute crops/products of 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 lift overall sector competitiveness.

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

Glossary

Terminologies using in this national policy are defined as the following:

21st Century crop refers to a multi-beneficial crop which is responsive to the needs of developing countries, global economic trend, and climate change.

Agri-business crop refers to the crops which are grown for commercial purposes

Agriculture ecology refers to the combination of plants, animals, and microorganisms that interact each other in physical and chemical environments which use by human to produce food or raw materials to fulfill their needs.

Agronomy refers to the science of soil management and plantation

Cassava Agriculture Commercialization refers to the process 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 are suitable for cassava production

Cassava refers to a plant storing lot of starch in roots, resistant to climate change, and can survive in less fertile soil. Its starch can process into many products and use as ingredient in food, industry, and bio energy. It has two cultivars (sweet and bitter varieties) originating in American and spread into Asia and Europe.

Cassava starch refers to starch extracting from cassava root. The extraction can use water to take away HCN or be done through grinding 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 a particular 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

Ethanol refers to the liquid, which is transparent, colorless, odorless which is in the alcoholic classification and can be used for fuel, beverage, perfume etc.

Governance framework:

Harmonized system (HS) refers to the classification method of goods used in 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 who receive purchase orders once buyers do not have enough or cannot buy from other sources.

Market based production refers to agriculture production which responds to market needs at quantity, quality, and price in order to averse the imbalance risk between demand and supply. Market needs to analyse 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 shall comply with organic standards required by buyers/markets.

Precision agriculture refers digital technologies used to accurately offer what plants needs in order to get high productivity.

Price taker refers to a company that shall accept 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 which public and private sectors cooperate to solve bottleneck issues within value chains.

Profitability refers to the ability to use existing resources to maximize profit.

Smart agriculture refers to technology revolution which enables agriculture to adopt 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 climate change to increase farmer income and supply market.

Traditional agriculture refers to agriculture which use old techniques, traditional tools and dependence on nature and customs.

Value chain refers to the combination of activities which are carried out by actors since production, processing and export

Annex

Annex 1: Policy measures for building sustainable cassava production for export of cassava-based products

Short-term (1-2 years): Enhancing cassava productivity for increasing farmers' income and growth of processing industries

Sort-term actions	Issues to be addressed	Causes	Policy measures	Responsible Institutions
Enhancing Productivity at farm to increase farmers' income, cope with price volatility, and maintain the down steam competitiveness	Yield decline	Soil fertility is not analysed, monitored and used properly based on scientific principles	Conduct regular soil surveys, track yields, and monitor farmers' land use practices	MAFF
			Define and promote only suitable areas for cassava production in according with sustainable practices and trade competitiveness	MAFF
		Knowledge on cassava agronomic practices are not disseminated	Gather and document successful knowledges available in Cambodia and the region	MAFF
			Experiment agronomic practices and disseminate to farmers through effective extension service systems	MAFF
			Train extension officers and local agents on agronomic practices and soil management related to cassava production	MAFF
			Authorize only professionally trained officers/local agents to deliver extension services to farmers	MAFF
			Map cassava cultivation areas, analyze production cost, and monitor agronomic practices in all cassava planting areas and update from time to time to ensure its correctness and effectiveness	MAFF
		Cassava varieties are not analyzed and promoted	Identify cassava varieties grown in Cambodia and assess their yields and productivity	MAFF

		based on soil, climate, topography, geographical conditions as well as industrial needs	Promote commercial cassava nurseries and private multiplication farms to distribute healthy/clean planting materials	MAFF
			Identify and import right varieties returning much economic gains to farmers and meeting industrial needs from foreign countries	MAFF
			Monitor and control the quality of imported planting materials and the circulation of cassava varieties between Cambodian and neighboring countries	MAFF
		Occurrences of pest and deceases affect the cassava productivity in some areas	Check, trace, monitor, and control pests, deceases and bad factors affecting cassava productivity and their widespread	MAFF
			Set up surveillance and control mechanisms to manage and mitigate risks of bad factors	MAFF
			Update and develop specific legal frameworks and regulations to control and intervene the widespread of bad factors	MAFF
		Quality of input supplies are not reliable	Assess quality of related cassava agricultural inputs and ban those which do not meet quality standards	MAFF
			Train input suppliers to be a secondary agent which can guide farmers the right use of agricultural inputs	MAFF
			Mandate the instruction of input application in Khmer and have local contacts for seeking advices	MAFF
		Climate change affect survival of cassava plants, growth and	Identify areas affected by climate change and analyze root causes and impacts on cassava farms	MAFF, RDB, MoE
			Develop a climate change adaptation plan for cassava farms in affected areas	MAFF, MoE

		productivity as well as creates additional costs	Build infrastructures to minimize negative impacts causing from climate change	MAFF and RDB
		Cassava cultivation depends on sky due to lack of irrigation system	Conduct research on low cost and efficient irrigation system for small scale cassava production	MAFF, RUA
			Pilot micro irrigation schemes suiting to small-scale cassava plantation	MAFF, RUA
			Design and test a loan scheme which farmers can invest in irrigation for year-round cassava production and grow flexibly based on market needs	RDB
	Rising cost of cassava production	Cost of agricultural inputs increases during the peak time (once they need to be used)	Develop an alternative financial support scheme which farmers in group can purchase input supplies in advance	RDB
		Most plots of cassava farms are small which tends to be not cost effective	Create collective land use mechanisms to minimize production costs, and increase effective use of production factors and household labors	MAFF, SNAs
			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	Analyze factors affecting the cost of agricultural services (comparison between individual and commercial services)	MAFF
			Organize agricultural services providers into groups or appropriate associations	MAFF
			Provide capacity building to improve their productivity and enhance service quality	MAFF

			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 so far	Harvest and post-harvest loss causing from human, nature and related factors are not analyzed	Study harvest and post-harvest loss on cassava and update as necessary needed	MAFF, RUA
			Train farmers and related value actors to adopt practical measures to manage losses	MAFF
			Set up facilities/infrastructure which can be used or rented by farmers to manage product losses and address distress sale situations	MEF, RDB
		Farming management skills is not introduced and no systematic supports to train farmers	Train farmers, especially heads of farmer organizations on farming entrepreneurship and financial management	RDB
			Promote saving schemes and credit unions at community levels	NBC, RDB
Enhancing regional value chain cooperation for mutual benefits (Cambodia and neighboring countries)	Exporting chip to neighboring countries is hindered by protectionisms and technical barriers to trade	The quality of chips does not meet product standards	Train farmers on the product quality management	MoC
			Search and create small machines suiting for households and local communities to process chips instead of manual chopping	MoC, MIME
			Design small scale and mobile drying facilities for chip processing (damaging from rains)	MoC, MIME
			Develop and update product standards, and monitor compliance of processors and traders	MoC
		Cross-border trade is not favorable for Cambodian farmers and processors	Have a special support fund to intervene during supply glut, border close due to harvesting time of neighboring countries, and unpredictable events	MEF, RDB

Promoting export of processing products for value creation and market security	Cassava harvesting season is short which last for 4-5 months	Competition for roots is very serious during harvesting season which affects the operation of cassava processing industries (starch, ethanol)	Promote contract farming between farmers and processors to leverage mutual benefits	MAFF, MoC
	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 weak governance system	Develop entrepreneurship and improve business management for access to finance and development impact fund	NBC, MoC
	Processing industries could not create much values from processing line	Because of limited finance, they could not take benefits from advanced technologies to reduce costs and create more values from wastes (residue, waste water)	Create investment stimulation funds to assist local starch processors to improve business resulting in competitiveness	MEF, NBC
			Provide technical supports to local starch processors on access to new technologies and value creation	MoC
	High electricity cost	Electricity is a major cost of cassava processing industries	Provide a special electricity rate for cassava processing industries, comparable to neighboring countries	MIME, EDC
			Have a flexible electricity use plan which can offer cheaper rate to processing industries	MIME, EDC
			Secure reliable supply of electricity without disruption	MIME, EDC
	Limited access to market, research and innovation	Most starch and other processors have limited access to market	Allocate budget for research and development on technology, knowhow and product development for cassava	MEF

		information, and especially know-how on modernizing factories and developing new products	Create networks for local processors to access to technology, mechanics engineering and marketing companies or global related service providers	MoC
	High transportation cost	Distance from processing factories to the country port is far and transport fee is more expensive than neighboring countries so make the cassava price higher	Negotiate with neighboring countries to set up clear procedures and create trade facilitation supports 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 cost and products cost so some taxes shall be removed or decreased	Reduce or exempt taxes to lower the product price as a way to enhance the trade competitiveness and provide more margins to processing industries	MEF
	Informal businesses disrupt and hinder the growth and smooth operation of formal and legal binding businesses	Unfair level playing fields which enjoy some groups, but seriously hurt and hinder formal, moral and legal binding committed businessmen	Inspect and monitor informal business at borders and companies bypassing laws and/or their actions resulting in damage of the Cambodian reputation and the government in global market	MoC, MEF, MoI, SNAs
	Unofficial administrative costs have been collected at	Unofficial fees create additional costs so reducing profit margin	Investigate, inspect and control malpractices which happen throughout the whole value chain	MAFF, MIME, MOC, MoI, MEF, SNAs

	different points along the cassava value chain	of farmers, processors and exporters	Investigate, invest and check immoral practices or issues of distrust between farmers, processors and traders	MoC, MoI, SNAs
	Trade facilitation is not well developed to meet the nature of cassava trading activities	Various supporting export documents are required so creates costs and time consumptions to apply and get those documents from different institutions practices are different from each entity.	Create one single window service offices at key trading and export areas to minimize cost and time consumption for trade documents	Related ministries
			Create a synchronized trade tool which requests can be processed in advanced and assures the reliability of service	MoC
			Identify new markets and negotiate with target countries for smooth trade arrangement and removing unnecessary documents	MoC, MEF

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 of cash during production and/or harvest season. Most of them harvests before time and enters into unfair deals	Design a financial scheme which aligns with cassava crop calendar and bases on smallholder farmers' livelihoods	NBC, RDB
			Train farmers on profitability and financial management on farm investment	NBC, RDB
			Create special financial schemes providing low interest rates to poor farmers or those living in low fertilize soil, climate sensitive and vulnerable areas	NBC, RDB
			Develop a digital financial platform which all aspects of cassava value chains are integrated	MoC

			and aligned to minimize cost and leverage mutual benefits of all actors	
	Supply chain is created to align with the need of processing industries such as quality of raw materials, conformance of quantity and intake schedule	Cassava is grown once the price is seen high in past years, so production is not stable. As such, cassava production system is designed to operate to pro-operation of the processing industries	Create cassava belts for processing industries based on geographic locations, soil quality, environment, logistics	CDC, MoC, MAFF
			Build roads at cassava plantation for year-round access or land use	RDB, SNAs
			Identify cassava varieties which can grow at different seasons as needed	MAFF
			Design and implement projects to support the private sector on fulling gaps/address supply chain issues	MEF, MoC, MAFF
	Profitability of farmers are sustained through updated research and development	Productivity at farm and production cost shall be well managed to provide an acceptable profit margin to farmers	Create research and Development Centers based on the nature of cassava value chain	MAFF
			Improve cassava productivity based on a sustainable land use framework through effective and timely extension services	MAFF
	Productivity of rural labors shall be improved to increase cost efficiency	As labor market in rural areas are changing due to migration, the productivity of household and labors shall be improved to manage cost and raise farming efficiency	Conduct skill need assessment for the cassava sector and develop a labor market strategy for cassava	
			Organize private contracted or household labors into groups to improve their productivity	
			Provide training to labor organizations to improve labor productivity/service quality	
	Supply chain structure is set up by	Gathering farmers into appropriate farmer	Conduct regular survey on households to track income from farm and profitability	MAFF

	organizing farmers into applicable collective mechanisms	organizations are important to enhance their bargaining powers for both sourcing inputs, access to agricultural services, and negotiating with buyers as well as access to low-cost finance.	Organize farmers into organizations or appropriate mechanisms to build and enhance economic power	MAFF
			Provide capacity building or start-up fund for farmer organizers to ensure functioning	MAFF
			Provide technical supports to farmer organization to carry out development initiatives benefiting their members	MAFF
	Issues of trust between farmers and processors/exporters are addressed by functioning intermediary mechanism and enabling environment	Market linkage shall be promoted through contract farming or applicable mechanisms to leverage mutual benefits, minimize risks in production and markets, as well as	Provide technical supports to private sectors and farmer organizations	MAFF, MoC
			Design and test contract farming models and scale up successful ones	MAFF
			Create local mechanisms to support and ensure transparency and accountability of the contract farming parties	MAFF, MoC, MoI, SNAs
			Improve existing conflict resolution mechanisms to promote trust and ensure effectiveness of the contract farming law and regulation	MAFF
Enhancing competitiveness at business to business level	Diversifying markets by diversifying cassava-based products	Once transforming into processed or end products, cassava has no pressures on urgent sale due to perishable natures, and less depending on single market	Develop an industrial development roadmap, especially for cassava	CDC, MIME, MoC
			Develop an investment attraction strategy for cassava processing industries	CDC, MoC
			Create a special support unit for investors looking for cassava related investment in Cambodia	CDC, MoC

			Organize a cassava business and investment forum to attract investors	CDC, MOC
			Design and implement development projects to back-up private investments once their investment plans are approved	MEF, MoC, MAFF
			Support SMEs/communities to grow, process and export organic products for high premium niche markets	MoC
	Cost of production factors of processing factories shall be gradually reduced	Incentivizing private sectors to generate electricity from wastes	Buy or allow processing factories to sell remaining factories to EDC or communities	EDC
			Provide licenses and commercial permissions to processing industries having electricity surplus	EDC
	Building skill labors needed by processing industries	Fee and cost to hire foreign experts or skill labors to address issues at factories are costly and time consuming	Identify skills, professions and expertise required by the sector	
			Develop skill match between academic institutions and industrial sectors	
			Provide on-site training to improve the productivity of unskilled labors	
	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 values for those industries and provide cheap products for rural farmers	Create a strategic link between agro-industries, i.e. rice mill, cassava starch, animal feed, fertilizers, to create local circular economies	CDC, MoC
			Promote and attract secondary industries to process cassava residues with locally available materials into agricultural inputs for local communities	MoC, MIME, MAFF

	Turning wastes into profits while assuring zero effect on communities, environment and eco-system	As cassava processing produce harmful wastes, environment management shall be in place to ensure safety and zero effects	Identify and define suitable sites for cassava processing industries	MoE, MAFF, MoC, MIME, CDC
			Create a guideline for investors to select sites for processing industries	MoE, MoC
			Develop and document responsibilities required by laws, regulations and policies which processing industries shall comply	MoE
			Check, monitor and evaluate environmental management performance of cassava processing industries	MoE
			Reward and support starch processing industries complying laws and capitalizing benefits from environment management, i.e. carbon credit, tax exemption etc.	MoE, MEf
Enhancing the sector competitiveness	Reducing costs of moving cassava-based products from Cambodia to markets	Official fees shall be reduced	Decrease official fees related to export documents	Related ministries
		Unofficial fee shall be eradicated.	Investigate, inspect and control unofficial fees happening throughout the chain process since production, processing and export of cassava	Related ministries
	Logistic costs are reduced by having more infrastructure and leveraging economy of scale through connecting between related sectors/industries	Various factors contribute to high costs, especially cheap alternative transportation means (vessels), inefficient trucks, competition of truck during harvesting season, costs of petroleum, road conditions,	Create freight forwarder facilities at appropriate locations which enable transport of cassava-based products through railways	MPWT
			Improve efficiency of truck companies to lower transport costs	MPWT
			Construct short-cut roads to reduce distances as available	MPWT

		and productivity of transportation services	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 paying for required export documents and waiting time due to late or long process are costs adding in a product price.	Develop a digital platform which trade related documents can be processed and paid online	MoC
			Provide special treatment to cassava-based products for clearance and related services at ports, borders, and critical points, as practices with the rice	MPWT
			Build facilities/amenities needed to support the timely and prompt movement of cassava-based products at ports and logistic points	MPWT
	Barriers to trade shall be addressed and advantages from trade preference treatment shall be capitalized	Export from Cambodia benefit much from none or low tariff rate granted by the trade preferential treatment schemes, so these advantages shall be exploited. Cambodia still benefits from the LDC for years despite of its graduation to a lower-middle income country	Analyze cassava markets and negotiate with target countries for smooth trade arrangement	MoC
			Address trade barriers (SPS) between Cambodia and target countries	MAFF, MoC
			Promote Cambodia's cassava products to international and global markets through effective marketing strategies	MoC
			Develop a transition plan for the country based on trade preferential treatment schemes and support the value chain actors to prepare for new trading environment	MoC
	Trade finance is not yet well developed to support the growth of cassava	Lack of effective and well-designed trade finance hinders processors and exporters to increase values and volume of trade as they	Develop trade finance schemes based on the needs of processing industries	MEF
			Improve regulatory frameworks to enforce trade finance schemes	MEF

	processing and export industries	could not utilize extra finance as working capitals	Provide direct loan to processing industries which have good performance and make positive impacts to farmers	MEF, RDB

Long-term (5-10 years): Cambodia shall focus on processing cassava into end products for domestic markets and export

Priorities	**Description**	**Rational**	**Actions**	**Responsible institutions**
Ethanol policy	Ethanol distilling from cassava can be blended with imported gasoline at an acceptable rate to make gasohol	- Creating jobs for Cambodian farmers - Reduce foreign exchange by reducing the volume of imported gasoline - Create jobs for local labors and reduction of migration - Attract investment in ethanol factories - Reduce emission of CO2 and pollution	- Review global experiences on challenges and successes of ethanal blending policy and - Analyze the competitiveness of Cambodia ethanol-based cassava and cost and benefit analysis for the Cambodian economy - Feasibility of implementing ethanol policies (customer behaviors - Roadmap and strategic development plan	SNEC, CDC, MIME, MoC, MAFF
Establishing a special zone for processing cassava into various end products	A variety of products can be processed from cassava which domestic markets are demanding and can be exported	- Creating jobs for Cambodian farmers -Reduce imports of products which consequently reduces trade deficit - Create jobs for local labors and reduce labor migration	- Review the experience of developing agro-industrial clusters in the world - Conduct market analysis (products/buyers which Cambodia shall produce and target) - Conduct the feasibility of the agro-industrial cluster in Cambodia	SNEC, CDC, MIME, MoC, MAFF

		- Promote the growth of backward and forward industries - Integrate into regional and global supply chains by exporting semi or end products	- Formulate a strategy and masterplan for agro-industrial processing zone/industrial cluster	
Producing animal feed and exporting meat products to international markets	Cambodia shall grow crops which have competitive advantages and import uncompetitive ones to produce cheap animal feeds, promote commercial animal farm, attract global well-known processors, and develop supporting infrastructure for meat export	- Create jobs for farmers - Create cheap animal feeds for local farmers - Reduce import of meats - Create value addition from the export of meat - Create more jobs within meat value chains	- Study the competitiveness of crops grown in Cambodia and identify crops which shall be imported to produce cheap animal feed - Conduct market analysis (demands, product standards, trade barriers, and trade competitiveness) as well as cost and benefit of developing agriculture based on animal feed and meat export - Formulate the strategy and development plan	SNEC, MAFF
Research and Development has capacity to breed cassava varieties suiting to Cambodia	A research and development center breeds cassava varieties suiting to environment, high yield, decease resistant, climate adaptation, as well as meeting need of processing industries.	-Increasing yields and income of farmers -make cassava competitive with substitute and competitive crops -Creating more values for processing industries	- Strategy for setting up a research and development center - Resource mobilizations - Capacity building of staff - Researches contributing to improve farming productivity	MAFF

Market intelligent Unit	Acting as a think tank to analyze market needs, industrial evolution, and trend of grain production. It provides strategic recommendations and supports 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
Product and Development Center	Research and product development which can be put in business by SMEs. It can be put in a business plan which is bankable by finance institutes	- Research on products which are available in markets - New products are developed, tested and transferred to SMEs - Building capacity of private sector	- Develop a roadmap to create a produce and development center - Mobilize resource and human capital to set up and operate the center - Provide effective services to private sectors and agriculture communities	MIME

Annex 2: Statistic tables

Potential Product 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	

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%	na	na	na	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

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	na
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

Global cassava starch market forecast for 2019-2023

Years	Starch production volume (MMT)	Starch production value (Million US$)
2018	6.9	3,138
2019	7.0	3,257
2020	7.1	3,368
2021	7.3	3,470
2022	7.4	3,567
2023	7.5	3,615

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