KINGDOM OF CAMBODIA

NATION RELIGION KING

MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES

POLICY ON
BIODIGESTER DEVELOPMENT IN CAMBODIA
2021-2030

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Preface

The Royal Government of Cambodia (RGC), under the strong and ideal leadership of **Samdech Akka Moha Sena Padei Techo HUN SEN, Prime Minister of the Kingdom of Cambodia,** agriculture sector remains considered one of the priority sectors of RGC. The agricultural sector has been contributing to the national economic growth, ensuring food security, promoting rural economic development, and improving livelihood of Cambodians.

The National Biodigester Program (NBP) has been operating since 2006. The program has been managed by the Ministry of Agriculture, Forestry and Fisheries (MAFF), and executed by the General Directorate of Animal Production and Health (GDAHP). In response to the remarkable development in the biodigester sector, in 2016, the Policy on Biodigester Development 2016-2024 was developed to manage the sector. Since 2016 however, the sector further diversified with investments in large scale biodigesters not only for farms but also agri-businesses such as cassava factories.

Have been seen these developments, MAFF established the technical working group in January 2021 to update the policy on biodigester development in Cambodia. As result, the policy on biodigester development framework for the period, 2021-2030 has been developed and is guided by MAFF policies and strategies with the overall objective to promote the development and effectively and sustainably use of biodigesters and the implementation of sustainable development goals in Cambodia.

In this occasion, I would like to express my appreciation for the efforts of the leaders in the ministry, the technical working group, the GDAHP, and all relevant stakeholders that have supported the policy on biodigester development in Cambodia.

Finally, I would like to encourage all relevant stakeholders to participate in the effective implementation of the policy on biodigester development in Cambodia 2021-2030, in order to enable farmers, rural communities and agribusinesses to improve their livelihoods and business profitability in a good and sustainable environment by increasing their business profitability through the use of biodigesters in efficient, safe and sustainable manner.

Phnom Penh, Date 14 Month October Year 2021

Minister

Ministry of Agriculture, Forestry and Fishery

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BIODIGESTER DEVELOPMENT IN CAMBODIA, 2021-2030

1 Introduction

Cambodia has experienced rapid socio-economic development, thanks to sustained economic growth, peace, and stability over the recent decades. The Royal Government of Cambodia (RGC) has the vision to reach the status of an upper-middle income country by 2030. Agriculture is one of the prioritized sectors in the development trajectory as indicated in the 4th Rectangular Strategy (RS) and the National Strategic Development Plan (NSDP) 2018-2023.

The agricultural sector has grown with a robust 4% per annum in the period 2011-2017[1], albeit that the agricultural GDP contribution declined in the period with 1.8% per annum. In addition, the sector is the main source of local employment (37% of total labor force) and income in rural areas.

The Agriculture Sector Master Plan 2020-2030 envisions to modernize and increase the sector's competitiveness, inclusiveness and resilience to climate change and sustainability with the following objectives: i) promote the growth of the sector's value added to the economy at 3% per year by 2030; and ii) increase the annual agricultural labor productivity from US$ 1,839- to US$4,625/capita by 2030. At the strategic level, the Ministry of Agriculture, Forestry and Fisheries (MAFF) has adopted the Agriculture Sector Strategic Development Plan 2019-2023 targeting an annual sector growth of 1.6%-1.8%. Key strategies to achieve this growth include improving productivity, diversification, and commercialization of agriculture, animal husbandry and aquaculture, in a sustainable manner and thereby conserving and protecting forests and fisheries.

The livestock sector is the 3rd largest contributor to the sector's growth and grew with 11% in the period 2010 to 2019[2]. This sub-sector is governed by Prakas 549 which stipulates the requirements to ensure sustainable supply, both in terms of quality and quantity of animal products, to serve the domestic and export markets. Furthermore, the Prakas stipulates the farm classification, technical regulations, and procedure for livestock production, and particularly the requirements for biotreatment and management of animal manure. The Prakas requires all commercial farms to comply with a set of standards including the ones on the bio-security system, manure waste management, sanitation, and environment safeguards such as preventing odor and noise pollution.

Next to the livestock sector, this biogas policy supports the implementation of the National Cassava Policy and the Industrial Development Policy, in particular related to supporting the agro-processing facilities with adequate treatment of wastewater in biogas plant to recover energy for production processes. This in turn will improve the economic performance of those facilities, increase trade and innovations. At the international level, this policy is also strongly linked to Cambodia's updated Nationally Determined Contributions (NDC) to climate change, both in terms of reducing greenhouse gas (GHG) emissions and improving climate resilience.

This biogas policy ameliorates and replaces the policy on biodigester development 2016-2025 for the period 2021-2030 guided by the rapid developments in the biogas sector, changes in rural

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[1] down from 5.8% per annum during 2004-2010. The sector's share to gross domestic products (GDP) declined from 34.6% in 2011 to around 23.6% in 2017.

[2] Agriculture Sector Strategic Development Plan 2019-2023

economy and to align the policy with the Agriculture Sector Development Plan 2019-2023 and other sectoral policies and plans pertaining to biogas. This policy provides clear goals and objectives to direct and accelerate biodigester uptake at all scales in the livestock and agro-processing sector in Cambodia.

1.1 Status of and prospect of the livestock sub-sector

Table 1 tabulates the head of livestock held by farm type and the changes in the period 2016 to 2020. Evident is that the share of livestock produced by family-based farming remains the dominant suppliers of livestock with the exception of swine. Commercial farms have gradually become the main supplier for swine (pork). The share of swine commercially raised increased to 55% in 2020 (increased from 599,341 heads in 2016 to 1,379,623 heads in 2020). As of 2020, there were a total of551 commercial swine farms, most of which are fattening farms (489) and some are breeding farms (62)[3].

Table 1: Total livestock production (heads) in the period 2016-2020

Animal	Type	2016	2017	2018	2019	2020
	Family	2,897,126	2,951,359	2,917,302	2,769,885	2,835,360
Cattle	Commercial	23,188	20,363	11,232	9,877	13,216
	Family	523,320	508,458	500,778	447,167	423,614
Buffalo	Commercial	194	198	217	218	211
	Family	2,371,283	2,331,512	1,934,917	1,030,494	1,137,056
Swine	Commercial	599,341	742,771	812,934	1,155,431	1,379,623
	Family	28,402,486	28,652,409	28,956,342	27,763,479	30,553,233
Poultry	Commercial	7,331,275	7,592,530	9,210,409	12,631,974	17,508,936
	Family	5,610	5,055	4,207	3,771	2,971
Horse	Commercial	64	82	89	30	-
	Family	400	461	459	648	944
Sheep	Commercial	67	-	-	-	781
	Family	22,719	28,542	25,747	27,740	29,981
Goat	Commercial	6,258	365	700	-	300

Note: "-" no data
Source: GDAHP, 2021

[3] GDAHP 2021

Livestock businesses, despite the growth, face barriers including high production costs (particularly electricity) leading to low competitiveness compared to imported live pigs. In terms of operating costs, swine farms with evaporative cooling system (known as EVAP farms) are more energy intensive, compared to ones without such a EVAP system. Farms that are not connected to the grid rely mainly on generators powered by diesel and biogas is viewed as an effective way to reduce the fuel cost[4].

Domestic meat demand is projected to increase from 290,000 ton in 2019 to 328,000 ton in 2024. In 2020, domestic meat production met 85% of total demand[5]. This rapid increase will promote growth of the livestock industry as foreseen by the Agriculture Sector Master Plan 2030. In addition, government has released several rounds of immediate and long-term measures to support the economy including a special lending programme via the Agricultural and Rural Development Bank in response to the COVID-19 pandemic, aiding the agricultural sector. It is expected that the tourism sector will rebound strongly in the near future aiding to an increased demand for food and meat. Moreover, Cambodia has signed a free bilateral trade with China, and soon with Korea, the livestock production will also serve these markets.

In light of these aspects, Cambodia will continue working on developing and enforcing the legal frameworks that promote competitiveness, good animal husbandry practices, in particularly hygiene standards for animal products and at slaughterhouses, as well as management of manure and wastewater to prevent the transmission of zoonotic diseases, comply with export requirement and reduce production costs.

1.2 Status of the agro-processing industry

Over the last decade, agro-industrial crops have increased noticeably at an average of 13% per annum: from 6.14 in 2010 to 15.13-million-ton agro-products in 2019. Rubber production has increased at the annual rate of 20% during 2010-2019 reaching 287,630 tons. At the same period, export of rubber rose 7 times: from 42,000 tons in 2010 to 282,000 in 2019. Other agro-industrial crops shared the same trends, except in 2018 when the cassava production dropped to 13.5 million tons due to Mosaic disease[6], followed by cashew 0.2 million tons and red corn 0.9 million tons.

Cassava has become the second largest crop in the country after paddy rice, resulting from the rapid expansion of cassava planting areas over the last decade. Currently the cassava sub-sector accounts between 3 to 4% of national GDP[7]. Most of the cassava is exported in the form of fresh roots and dry chips. Increasingly however, cassava is processed to tapioca starch (15 factories) or distilled to ethanol (7 ethanol plants) with focus on export and creation of added value.

To further support the cassava sector, the Government approved National Cassava Policy in 2020 to position Cambodia to the home of cassava processing industries and a reliable supplier of cassava-based products for global markets. As cassava wastewater can generate biogas and be transformed into electricity, the policy stipulates that "*MME shall encourage cassava processors to invest in biogas facilities by supporting legal procedures, granting permits, and complying with requirements, as well as*

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[4] *According to the NBP Market Survey (2019), farms investing biogas system can recover the investment in 2 years (for those with EVAP farms), and up to 18 years for the open farms.*
[5] According to the GDAHP Annual Report 2020 (released 2021),
[6] *The cassava mosaic virus causes leaf mottling and may kill host plants.*
[7] *National Cassava Policy 2020-2025*

buying back remaining electricity at a reasonable rate [to Electricité du Cambodge (EdC)] or allowing its sale directly to nearby households at the same rates as local private and/or state suppliers."

1.3 Agriculture and climate change

The agriculture sector in Cambodia is the second largest source of greenhouse gas (GHG) emissions after the Forest and Other Land Use (FOLU) sector, emitting an estimated 18,398 GgCO2e[8] in 2016 or around 11.2% of total emissions or 56.4% of total emissions excluding the FOLU sector[9]. Therewith, the emissions in the agricultural sector are larger than the Energy, the Industrial Processes and Product use (IPPU), and Waste sector combined. Cambodia's updated Nationally Determined Contributions (NDCs) report projects that GHG emission in the business-as-usual scenario will grow from 21,200 $GgCO_2e$ in 2016 to 27,100 $GgCO_2e$ by 2030, but with the implementation of 17 identified mitigation actions, including biodigesters[10], emissions by 2030 can be reduced with 6.2% to 20,200 GgCO2e.

Climate change is resulting in less predictable and more variable monsoonal rainfall and the temperature in Cambodia would increase by about 0.60 – 2.5 degrees Celsius by 2100[11]. This will have various negative effects on the sector. According to the Intergovernmental Panel on Climate change (IPCC), this will reduce milk production in high producing cows and meat production in ruminants because of a reduction in body size, carcass weight, and fat thickness. New diseases may affect livestock immunity and prolonged high temperature may affect livestock health (e.g., protein and lipid metabolism, liver functionality[12]. The temperature increase will reduce plants digestion rate which leads to reduced nutrients for forage plants. The temperature increase will change heat exchange between animal and the environment particularly heat stress will impact on feed eating, growth, reproductive, body support, and age of animals. Climate change may change the disease outbreak and animal disease distribution through various means. The increased temperature, drought and flood will be influential on viral pathogens, animal immunity, transmitted disease and spreading disease.

1.4 Status of Biodigester Development in Cambodia

Since the promulgation of the first biodigester policy, the sector has contributed to managing animal manure and wastewater with the introduction of small, medium and large scale biodigesters at households, livestock farms and other agribusinesses and with a number of new private sector companies entering the market. In the next sections, the status of domestic, small, medium, and large-scale plants is summarized. In this Policy, the following definitions regarding biodigester plant scale are used:

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[8] *1 Gg = 10^9 gram= 1 kt (1 kiloton). CO2e = Carbon dioxide equivalent which is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP)*

[9] *Cambodia's First Biennial Update Report 2019*

[10] *Biodigesters for latex and rubber industry, biodigester for small, medium, and large farms and to treat the organic fraction of municipal solid waste.*

[11] *Cambodia's Second National Communication under the United Nations Framework Convention on Climate Change (2015)*

[12] *https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf*