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PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

CREATING AN ENABLING ENVIRONMENT AND INCENTIVES TO BOOST SUSTAINABLE AGRO-PROCESSING INDUSTRY

INCLUDING HIGH GROWTH POTENTIAL SMEs

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PAGE supports nations and regions in reframing economic policies and practices around sustainability to foster economic growth, create income and jobs, reduce poverty and inequality, and strengthen the ecological foundations of their economies. The partnership offers a comprehensive and coordinated package of technical assistance and capacity building services. Thanks to this integrated approach and support of a wide range of partners, PAGE is increasingly recognised as a model to deliver coordinated support to countries to achieve their Sustainable Development Goals (SDGs) and Paris Agreement targets.

As a partner country since 2014, Mauritius has received support from PAGE towards the achievement of the country's Nationally Determined Contributions (NDCs) and several SDGs. Mauritius has also directly recognised PAGE as attributing to their achievements in the Voluntary National Review (VNR) of its SDGs during the High-Level Political Forum (HLPF).

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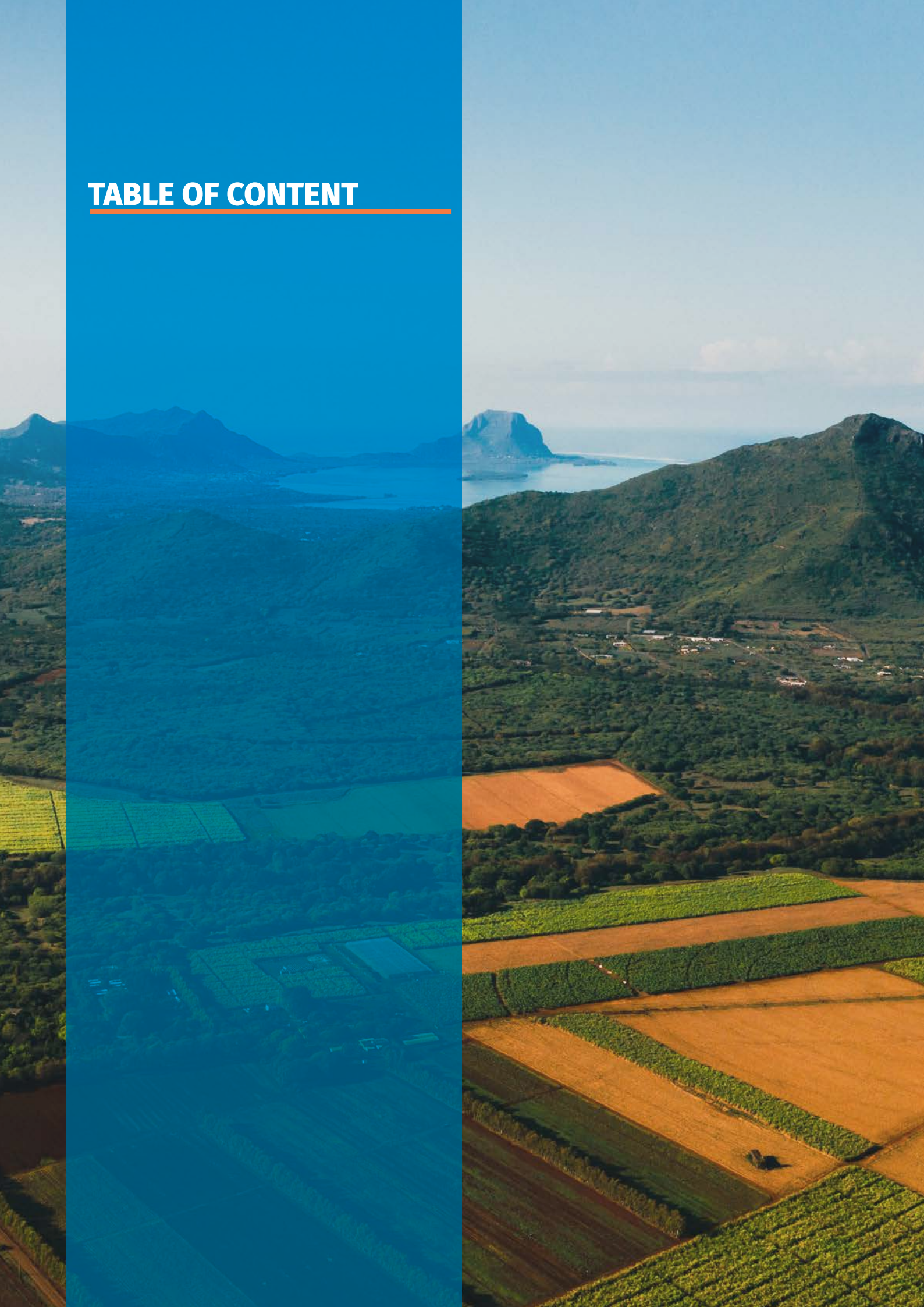

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ABBREVIATIONS

AFD	African Development Bank
AI	Artificial Intelligence
AMB	Agricultural Marketing Board
ASL	Agricultural State Lands
DBM	Development Bank of Mauritius
EDB	Economic Development Board
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross domestic product
HACCP	Hazard Analysis Critical Control Point
HII	High Impact Initiatives
ILO	International Labour Organization
ISP	Investment Support Programme
KA	Key actions
LUD	Land Use Division
MCA	Mauritius Chamber of Agriculture
MCCI	Mauritius Chamber of Commerce and Industry
MCIA	Mauritius Cane Industry Authority
MSMEs	Micro Small and Medium Enterprises
MOAIFS	Ministry of Agro-Industry and Food Security
NAPRO	National Agricultural Products Regulatory Office
PAGE	Partnership for Action on Green Economy
R&D	Research and Development
SAG	Switch Africa Green
SIFB	Sugar Insurance Fund Board
SMEs	Small and Medium Enterprises
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization
UoM	University of Mauritius
WHO	World Health Organization

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EXECUTIVE SUMMARY

Due to the COVID-19 pandemic and the current Russia-Ukraine conflict the Mauritian consumers have experienced a reduction in their purchasing power. The price of food commodities soared, and the government thrived through an observed social discomfort. The local farmers observed marked losses through the pandemic and had to go through high production costs due to an increase in freight charges, fertilizer, and feed prices as well as equipment and fuel costs.

Most of the local vegetable, meat, poultry, and milk producers operate as small and medium enterprises (SMEs). Though most of them are registered as agricultural practitioners with governmental agencies, most of them are not registered as SMEs. A fear of taxation and over disclosing their incomes have often discouraged them from this registration, and consequently prevented them benefitting from schemes proposed by SME Mauritius. This statuary body provides support as well as financial assistance to improve management, profitability and expand the market of the registered SMEs.

A 10 Year SME Master Plan was developed by the Ministry of Business, Enterprise, and Cooperatives in 2017 with the following set of objectives:

1. to improve SME competitiveness,

2. to foster high growth potential SMEs,

3. to upgrade skills and job opportunities ,

4. to improve value addition and

5. to increase market share.

It proposed several strategies for the SME sector, however, these were mostly generic and not targeted to its specificity. The sector, like others, must thrive through an increased cost of labour despite the implementation of a minimum salary basis. With the new international configuration, it is high time to re-think the strategies for the SME sector.

Small agricultural enterprises are different. Their goods are perishable, production is highly influenced by climate and the price is non-regulated. Over the years, the government has provided continuous technical assistance, and proposed measures to support operators in this sector. The poultry sector is a success story, while the dairy sector is an outcry. Vegetable producers are ageing, and face continuous increases in labour, fuel, fertilizer, and agro chemical costs. With a proposal to create an enabling environment for these producers to become agro processors, it seems evident that the production systems must be reviewed to provide a continuous supply and quality. The will of local producers to turn to agro-processing is real.

This project has two main objectives:

1. Review the current policies and schemes for SMEs in the agriculture sector.

2. Assess the impact of COVID-19 on these SMEs and propose measures to mitigate these impacts.

The surveys revealed that though several schemes have been proposed by the government, adoption of some schemes were low. Major reasons that discourage applying for these schemes were the burden of paperwork, the high qualification criteria and even a lack of awareness of the proposed schemes.

Vegetable producers are asking for a regulated pricing mechanism of their produce and are waiting for a digitalised wholesale platform, while climate change and an unpredictable international atmosphere add to pessimism in the sustainability of their operations.

The cattle farmers and dairy producers emphasised the high productions costs and the severe competition of imported dairy products on local shelves. They also expressed a certain dismay on the veterinary services with respect to artificial insemination processes. Their demand for a subsidy on their dairy produce was unanimous, and schemes for the purchase and import of certain equipment were requested.

The beekeepers were faced with major setbacks in the past years due to high infestations of beehives by pests. Varroa mite, beetle and moth, pose considerable concerns for the health of the bees. Often valued for the provision of honey and honey products, their role as a pollinator is often not applauded and so an incentive for beekeepers for the services bees provide as pollinators was proposed and highly appreciated. Similarly, marked green spaces and land can be provided for beekeeping. Cooperatives in this sector are urged to initiate projects on the purchase of centralised equipment as well as support joint marketing platforms for selling bee products locally to international markets.

With the COVID-19 pandemic all operators in the agriculture sector expressed a loss in income and most of them expressed the following concerns:

1. limited access to site,

2. reduced available labour,

3. wastage of produce,

4. theft and

5. limited access to markets.

Agro-processing facilities can help to avoid wastage. Moreover, digitalised selling platforms and new selling strategies such as online purchasing and consequent door delivery services can help to generate a constant income.

Producers felt there was an effort by the government to help them during the hardships of the pandemic, however, SMEs in the agriculture sector do not benefit from several schemes due to the high level of bureaucracy. The local dairy sector needs special attention as well as a new strategy to boost optimism among the operators.

The SME sector in the agriculture sector will observe a boost in the future by:

1. Fulfilling the gaps in the agro-processing food chain in terms of:
   - technical support;
   - technology transfer;
   - post-harvest handling techniques;
   - storage facilities;
   - research and development;
   - training and
   - adequate market analysis.
2. Encouraging new farming techniques to improve the efficiency and quality of the food produced.
3. Establishing new business market-driven models.
4. Integrating Internet of things-based systems.
5. Encouraging strategic partnering between SME producers and agro processors.
6. Educating the population towards a differentiated consumption of locally produced food.
7. Implementation of regulations and certificates.
8. Consolidating adequate financial support schemes.

2.
INTRODUCTION AND BACKGROUND

2.1 STUDY CONTEXT

With a 70% reliance on the importation of food, Mauritius faced a great deal of challenges during the peak of the COVID-19 pandemic. This situation has triggered opportunities for Mauritius to strengthen food security, regain food sovereignty, and enhance its climate resilience for food production. To recover from this pandemic sustainably and strengthen the resilience of the food production systems, the government proposed key strategies and budgetary measures. However, attaining self-sufficiency in staple food production is still a utopian concept to many.

Initiatives include the Smart Agriculture project, for which Rs 16 million has been earmarked. There is also the collaboration with the Food and Agricultural Research and Extension Institute (FAREI) and the University of Mauritius (UoM), for which Rs 120 million was invested by the European Union (EU) for research, innovation, and training to promote sustainable and modern agriculture[1].

This study aims to review the adoption and effectiveness of current governmental policies and schemes, identify barriers to their adoption by local SMEs and propose new policies that will help facilitate their productivity. Within the scope of this study, other avenues for incentives (other than tax) will be identified, that target the support of technological advancement and innovation in the agro-processing industry. The study will focus on the impact of COVID-19 on SMEs in the agro-processing sector with a key emphasis on farmers in this supply chain. Lastly, a sustainable development plan will be proposed using a bottom-up approach with the producers being key in the policymaking.

[1] Smart Agriculture project to promote Mauritius' agro-ecological transition. Government of Mauritius. Available at: <http://www.govmu.org/English/News/Pages/Smart-Agriculture-Project-to-promote-Mauritius%E2%80%99-agro-ecological-transition-.aspx>

2.2 AIM OF THIS PROJECT

This project seeks to review the current state of policies (SME Act, 10-Year SME Master Plan, etc.) to identify the gaps in the current financial, regulatory, and environmental framework. It will then propose policy measures through consultations with all relevant stakeholders. It will also evaluate the extent of the impact of COVID-19 on SMEs in the agro-industry to identify the key factors and thereafter propose countermeasures. In the context of the agro-industry, this study addresses producers in the following sectors:

- crop production (planters),
- dairy farmers,
- livestock farmers,
- apiculture,
- agro processors.

3.
AN OVERVIEW OF THE MAURITIAN ECONOMY

Due to COVID-19, budgetary allocations to the different sectors had to be reviewed and a partial skew for the health sector and social security was inevitable. To better understand the allocations for the agriculture sector, it is wise to consider the Mauritian economy.

3.1 CONTRIBUTIONS TO THE GDP

Mauritius is an island country with an estimated population of nearly 1.3 million people. The national gross domestic product (GDP) growth was estimated at 3.6%[2] for the year 2021. Infact, the country gained a re-classification, placing it in the group of high-income countries in July 2020. The economy of the island is influenced by several sectors such as agriculture, manufacturing, financial and insurance, among many others. In 2020, agriculture contributed to 4% of the GDP[3]. The seasonal variability, number of tourists, total imports and export of goods, international trade and conflicts, agricultural production, apparel, and products for local consumption all have a significant impact on the country's total income.

The COVID-19 pandemic caused major contractions in the growth rates of most sectors, with a significant negative impact on the tourism sector. The GDP alone reached -14.9% following the pandemic in 2020, leading to a severe financial crisis. The manufacturing, construction, wholesale and retail trade, as well as information and communication were all negatively impacted by a minimum of 20% for the year 2020 as opposed to 2019. Within these sectors, multiple contributors operate, maintain, and strive to improve the financial status of their respective economic affiliations. One such major group of contributors are the SMEs.

[2] Statistics Mauritius (2022). 'National Accounts Estimates (2018 – 2022)'. *June 2022 Issue*.
[3] Mauritius Chamber of Commerce and Industry(2021). 'Economic & Trade Review 2019/20'.

3.2 SMES IN MAURITIUS

In 2017, a total of 125,543 Mauritian SMEs were recorded, indicating an increase in the percentage of SMEs by 36% from 2007. They contributed to 40% of the GDP, and represented 55% of the national employment, adding Rs 175 billion in value to the Mauritian economy[4]. In Mauritius, SMEs play a crucial role in the socio-economic development of the country. They must be offered tailored support by the government and private bodies to enable the creation of an enabling environment to establish these enterprises and help them flourish. An ideal support would be in the form of schemes and credits and the period between 2011 and 2017 saw a total of Rs 7.958 billion approved by banks as credit incentives to support SMEs, which led to a significant increase of 36%.

In general, SMEs cannot be defined consistently with a common definition due to their reliance on contexts (Leopoulos, 2006). In Mauritius, the Small and Medium Enterprises Bill (No. XV of 2017)[5] defines three types of enterprises with respect to their turnovers (Table 1). SMEs operate under SME Mauritius Ltd (previously SMEDA) with a modern, business-friendly, and appropriate legislative framework[6]. However, the SME Act has been modified following the budget of 2022-2023[7], where it was announced that the range of turnovers for SMEs would be increased. Additionally, a new category has been included for mid-market enterprises with a turnover of up to Rs 250 million. Such changes are intended to grant more SMEs access to government support programmes and financing.

[4] MCB (2017). 'SME Report: Local entrepreneurs in Mauritius'. *Mauritius Commercial Bank*. Available at: <https://www.mcb.mu/en/media/sme/SME%20Report%202017_tcm70-32356.pdf>
[5] Government of Mauritius (2017). 'The Small and Medium Enterprises Bill (No XV of 2017)'. *Explanatory Memorandum*. Ministry of Business, Enterprise and Cooperatives. Available at: <https://mauritiusassembly.govmu.org/Documents/Bills/intro/2017/bill1517.pdf>
[6] Government of Mauritius (2017). 'Small and Medium Enterprises Act 2017 (No. 16 of 2017)'. Legal Supplement, *Government Gazette of Mauritius No. 114* of 7 December 2017. Available at: <https://www.informea.org/en/legislation/small-and-medium-enterprises-act-2017-no-16-2017>
[7] Government of Mauritius. 'Budget 2022-2023'. Available at: <https://budgetmof.govmu.org/documents/2022_23budgetspeech_english.pdf>

Table 1. SMEs categorised based on their turnovers.

Category	Range from the SME Act	Range proposed in Budget 2022-2023
Microenterprise	Not more than Rs 2 million	Not more than Rs 10 million
Small enterprise	More than Rs 2 million but not more than Rs 10 million	More than Rs 10 million but not more than Rs 30 million
Medium enterprise	More than Rs 10 million but not more than Rs 50 million	More than Rs 30 million but not more than Rs 100 million

3.3 SMES IN AGRIBUSINESSES

The agribusiness/agro-processing industry revolves around the transformation of agricultural products into value-added products. Due to the presence of various cultures, there are diverse cuisines present in Mauritius. This has led to the favouritism of certain processed foods such as pickles, crystallised fruits and vegetables, canned fruits and vegetables, deep-fried products, and minimal processing (dicing and/or packaging), among others. By 2014, the country recorded poor trade performances from the agro-processing industry at the level of exports, amounting to only Rs 15 million[8].

Over the past few years, SMEs have received increased eligibility and facilities to promote agribusiness involving crop production in open-fields or under sheltered farming systems. Furthermore, various incentives have been provided to these enterprises to promote a green economy. According to the Switch Africa Green (SAG) initiative, developing a green economy is a significant opportunity for Mauritius, which can lead to substantive economic growth and jobs creation. Mauritius joined PAGE in 2014 and has consistently worked with various policymakers on various action plans related to that field. The 10-Year SME Master Plan, addressed by the Ministry of Business, Enterprise and Cooperatives, undoubtedly emphasised the importance as well as possible ways of greening SMEs in Mauritius (Ministry of Business, Enterprise and Cooperatives, 2020).

[8] Government of Mauritius (2021). 'Mauritius National Export Strategy Agro-Processing Sector 2017-2021'. Available at: <https://industry.govmu.org/Documents/NES/2_Agro-Processing_web.pdf>

3.4 FOOD PROCESSING FOR SME AGRO PROCESSORS

The most dominating food processing activity present in Mauritius is the production of sugar, which has been ongoing for decades. However, there has been a slow increase in the number of other food processors. It should also be noted that agro processors do not consist of only vegetable and fruit processors. They also exist in the processing of products from the apiculture, dairy and livestock sectors. Productions from these sub-sectors have not been stable over the past few years, in terms of the food processed, and not much data is available. Exports of such locally produced commodities is also low. Agro-processing includes: sorting, packaging; freezing, drying; frying; flour production; oil extracts; canning, etc. Depending on market demand and available produce, an array of products can be developed.

The gross output for locally processed food for 2016 was US$ 608,697 (000's) and dropped to US$ 561,641 (000's) in 2017[9]. The gross value for the export of vegetables and fruits decreased from US$ 3.9 million to USD 3.6 million from 2018 to 2020[10]. The same trend was seen in dairy products and meat preparation. It should be noted that part of these exported commodities are produced locally and imported from other countries.

3.4.1 Types of products from agro processors

The main category of processed items (from SMEs) is derived from the non-sugar crop sub-sector, which includes food crops, fruit crops and the livestock sub-sector (including apiculture). From each of these sectors, a large variety of processed items can be obtained, although the number of products is too exhaustive to list them all (Table 2)[11].

3.4.2 Agro-processing chain

The chain of production in agro-processing involves 5 sections: input, production, acquisition, processing, and distribution (Figure 1). Smallholder farmers are the main actors in the input and production of agricultural products. The acquisition section is about sourcing and acquiring materials from the production zones (from

[9] Anon (2019). 'Mauritius - Agricultural Sectors'. Available at: <https://www.export.gov/apex/article2?id=Mauritius-Agricultural-Sectors>

[10] Statistics Mauritius. External Trade Year 2020.

[11] Strategic Plan 2016 – 2020 for the Non-Sugar Sector.

local farmers and imports) for agro processors. Once in the processing section, the materials are transformed into finished products, packaged, stored, and marketed locally or exported.

The major concern in this chain is that the input dictates the performance at the processing section. If farmers incur low production, the processors will automatically be impacted. In such cases, the only solution is to depend on imports. Currently, Mauritius imports nearly 70% of food commodities[12]. Importing agricultural materials is problematic during the times of COVID-19 and the Russia-Ukraine conflict, which are impacting the availability of such products and causing imports to be very expensive[13].

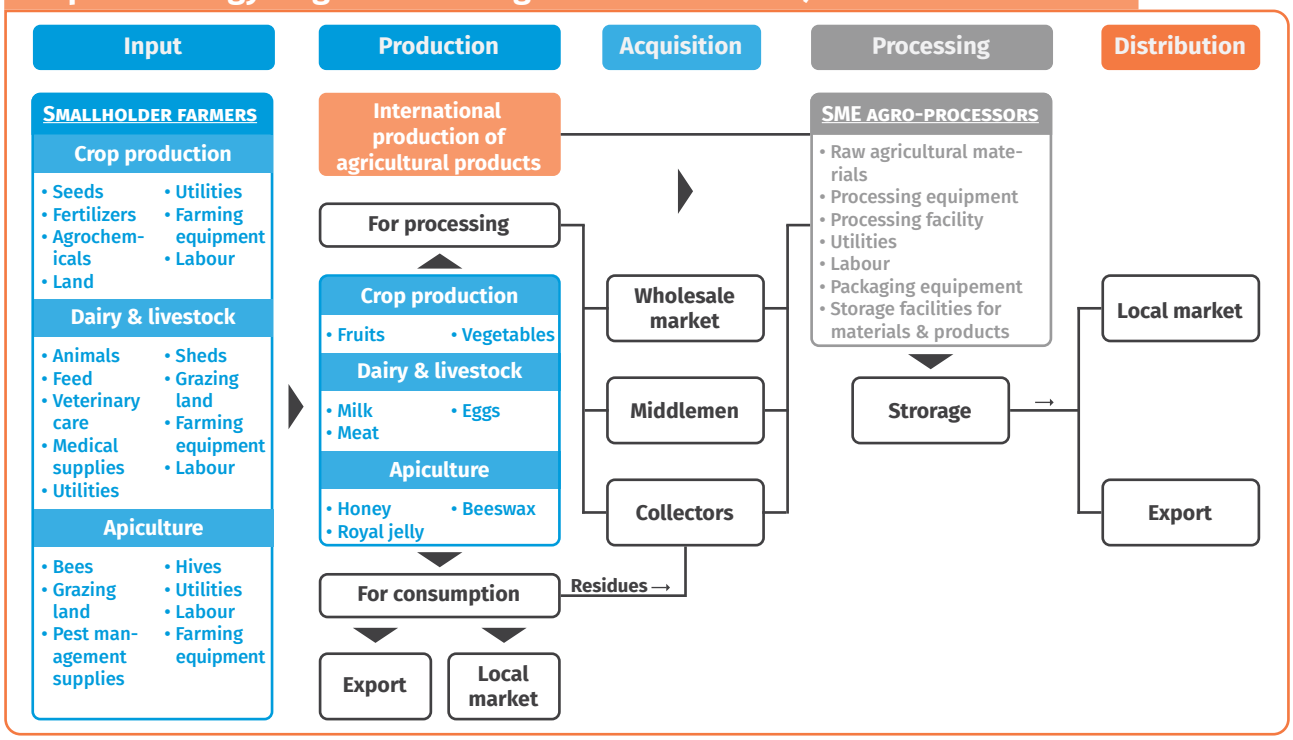
[12] International Trade Administration. Mauritius - Country Commercial Guide. Agricultural sector.
[13] FAO (2022). 'The Importance of Ukraine and the Russian Federation for Global Agricultural Markets and the Risks Associated With the War in Ukraine'. Available at: <https://www.fao.org/3/cb9013en/cb9013en.pdf>

Table 2. Processed items that can be obtained from agricultural activities.

Sector	Production Capacity (Annual)	Products	Can Be Processed Into
Food crop	Over 110,000 tonnes	Potatoes, cassava, manioc, onion, tomatoes, chillies, crucifers, cucurbits, leafy vegetables, garlic and ginger (many others)	Pickles (or 'achards'), crystallized vegetables, pastes (chilli and garlic), chips (potato & cassava), canned products (puree, pre-cooked vegetables), minimally processed and packed as whole, diced and or sliced vegetables, frozen vegetables
Fruit crop	Over 40,000 tonnes	Banana, pineapple, and seasonal fruits (litchis, mangoes, dragon fruit)	Dehydrated fruits, canned products (fruits and syrup), chips (banana), fresh juice, jam, jelly, frozen fruits
Livestock	Estimated at 2000 tonnes*	Meat (beef, pork, goat, mutton & poultry)	Sausages, burgers, nuggets, freshly/ packed marinated cuts
Dairy	Estimated at 2.5 million litres	Milk	Pasteurized milk, ice-cream, fresh cream, yoghurt, cheese
Apiculture	35 tonnes (honey)	Honey, royal jelly, beeswax	Lollipops/candies, soaps, honey butter, candles

* Statistics Mauritius. Agricultural productions 2018-2021.

Figure 1. Agro-processing food chain (adapted from the Mauritius National Export Strategy – Agro-Processing Sector 2017 – 2021).



The processing chain also includes the involvement of supporting services such as: sanitary services; research institutes; banks; certification and accreditation services, and business support services, etc. These services interfere at various stages of the processing chain.

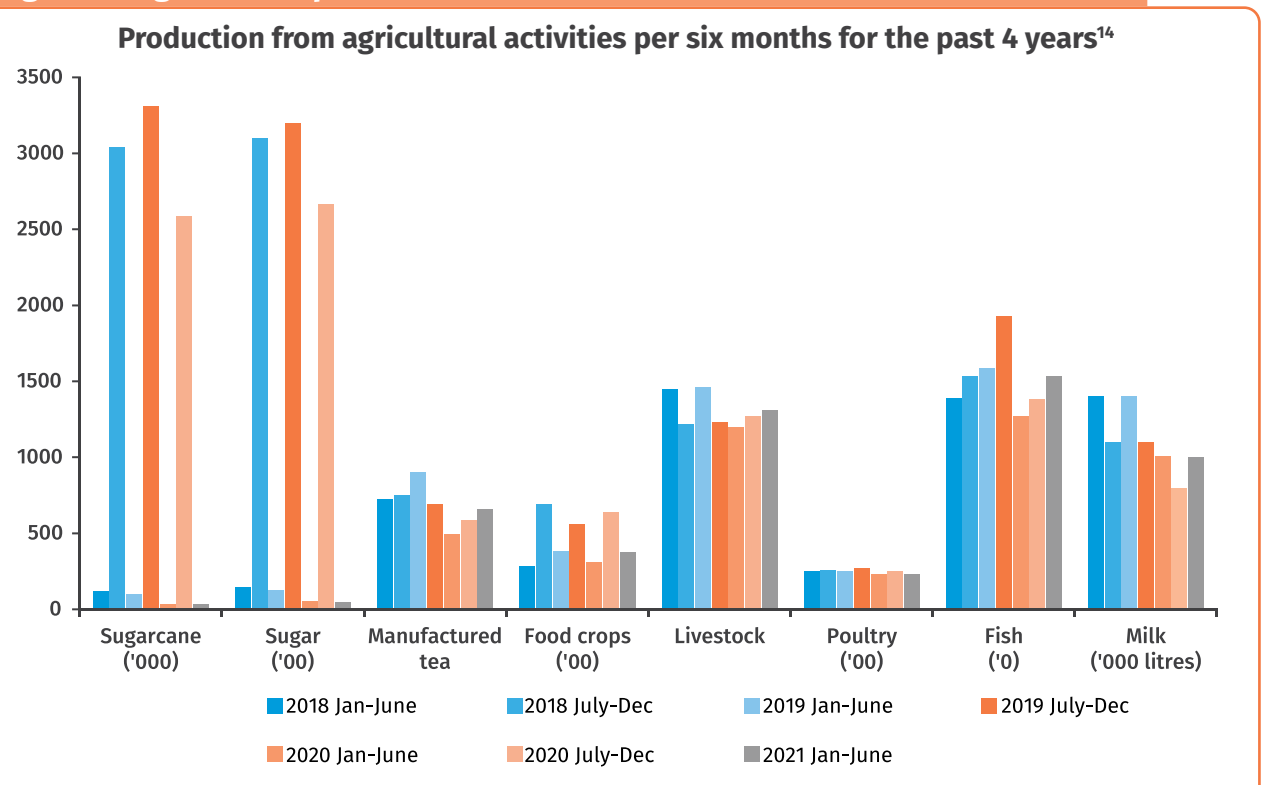
3.5 PRODUCTION STATUS OF THE AGRICULTURAL AND AGRO-PROCESSING SECTORS IN MAURITIUS

SMEs in the agro-processing industry rely significantly on agricultural products that are sourced locally and from overseas. Agro-processing in Mauritius has been an underperforming industry, leading to speculation that there could be issues arising from agricultural activities in the local context. The agricultural sector in Mauritius is predominantly occupied by sugarcane production, which in 2018 was recorded at 3,154,515 tonnes but in 2020, the harvest fell to 2,620,874 tonnes. This resulted in a considerable decrease in the production of sugar (Figure 2). The same trend was seen with the other agricultural activities except for food crop production. Surprisingly, the harvests increased by 0.7%, from 93,736 tonnes to 94,410 in 2020. This was due to an increase in areas of food production (1.7%) from 7,334 hectares to 7,456 hectares for the same year.

The year 2021 was considered as a period of re-assessment and improvement after facing the economic disaster brought on by COVID-19. Evaluating the whole year's agribusiness performance is not yet possible but comparing the first half year's performance against the previous years should give an indication on whether the agribusinesses were able to thrive through COVID-19 and keep up their production.

As per Figure 2, all the sectors indicated a decrease in their production for the period January-June 2020 as opposed to July-December 2019. The impact of COVID-19 induced a sanitary curfew for nearly three months which led to such recordings. However, as soon as business activities resumed, the productions were found to perform better for the period July-December 2020. Food crop production showed a significant increase in produce as well as fish and livestock. Unfortunately, the milk sector demonstrated a further decrease for the same period. Nonetheless, the ability to bounce back from the impact of COVID-19 requires an in-depth analysis to understand how it happened and whether it could have resulted in even better production.

Figure 2. Agricultural production from various activities from 2018 to 2021[14].



[14] Statistics Mauritius (2021). 'Agricultural and Fish Production'. *Economic and Social Indicators 2018, 2019, 2020 and 2021 (January to June Issue).*

3.6 IMPACT OF COVID-19 ON SMES

The success of SMEs is dependent on various factors that are categorised as internal and external factors (Padachi et al., 2012; Roopchund, 2020). If these factors are well implemented, respected, and maintained, there is no fear of failure. However, as from 2020, the occurrence of COVID-19 rendered SMEs vulnerable to the economic crisis when factors were disrupted. If SME failure occurred, efforts to contain the economic consequences of the pandemic would have failed, leading to an increase in unemployment, massive losses on banks with respect to their loans, the risk of a financial crisis and the fiscal costs of containing the crisis would continue to rise. Government policies to address SMEs' liquidity shortages were thus seen as essential to ensure a smooth economic recovery (Gourinchas et al., 2021).

The Mauritian government has helped SMEs through various schemes. Among the measures taken, the government took a loan of EUR 188 million from the African Development Bank, where a percentage of it was to help SMEs. Other methods included access to revolving credit with the Development Bank of Mauritius (DBM) for affected SMEs; tax relief and relief from non-tax obligations for local manufacturers and SMEs; credit for firms short on working capital; reduced levies for imports and cargo as well as moratoriums on loan repayments for both individuals and enterprises[15]. Although these measures were taken rapidly, they did help to mitigate the impact of COVID-19 to some extent.

Despite the countermeasures, the economic performance of Mauritius dropped significantly when GDP growth was recorded at -14.9 % in 2020[16]. As previously mentioned, SMEs play a vital role in the economy. A study conducted by DCDM Research in 2020 revealed that 50% of businesses (that participated in the study) were negatively impacted by the pandemic due to various factors (e.g., increase in input prices, cancellation of orders from clients, clients not paying bills, among others). In terms of sales, 68% of small/micro and 78% of medium enterprises experienced a decrease in sales[17]. Similar worse scenarios were seen in the study conducted by the International Labour Organization (ILO) on SMEs from various countries [18].

3.7 COUNTERMEASURES TO REDUCE THE IMPACT OF COVID-19 ON FOOD PRODUCTION

Reducing the impact of COVID-19 requires policy measures for the attention of decision-makers to adopt countermeasures in the short-, medium-, and long-term[19]. However, these measures are not limited to the current pandemic and could serve as potential strategies for events of similar magnitude to that of COVID-19.

In the short-term, efforts must be invested in preventing deepening disruptions to crop production and protection systems (especially food supply). For these life-saving food supply chains to remain available in the future, no crop production season should be lost.

Government policies and incentives will be necessary in ensuring that disruptions are reduced to a minimum. Mitigation measures that countries may consider include:

- Offering financial support (e.g., interest-free loans) to small farmers.
- Ensuring agricultural tasks in the cropping cycle are performed on time.
- Utilizing digital technology to provide real-time reliable information to farmers and traders on prices and market demands.
- Implementing mechanisation services to improve the efficiency of operations.
- Creating mechanisms to make food supply chains more inclusive for small farmers.
- Encouraging food production locally and simplify food chains.

[15] AFD. 'COVID-19 Crisis Response Budget Support Programme - Country: Mauritius Appraisal Report'. African Development Bank.

[16] AFD (2021). 'Mauritius Economic Outlook'. *African Economic Outlook 2021*. African Development Bank Group. Available at: <https://www.afdb.org/en/countries/southern-africa/mauritius/mauritius-economic-outlook>

[17] Business Mauritius and Statistics Mauritius (2020). 'Impact of COVID-19 on business in Mauritius'. DCDM Research. Available at: <https://www.businessmauritius.org/wp-content/uploads/2020/12/Survey-Presentation_Final_08dec2020.pdf>

[18] ILO (2020). 'MSME Day 2020: the COVID -19 pandemic and its impact on small business'. International Labour Organization. Available at: <https://www.ilo.org/empent/whatsnew/WCMS_749275/lang--en/index.htm>

[19] FAO (2020). 'Sustainable crop production and COVID-19'.

- Promoting the use of technology and automated systems for pest and crop health surveillance.
- Providing fast responses to crises by sending forecasts to farmers through cell phone SMS at no cost.

In the medium to long-term, crop production and protection systems should be monitored and assessed for their efficiency in food provision. This will also require the need to identify the areas of local food systems that need assistance to withstand and/or recover from such events. The focus on R&D must also include agronomics, e.g., the production packages and the complementary integrated disease and pest management packages.

- Farming systems should be implemented using recommended management practices: minimum soil disturbance, permanent organic soil cover, species diversification, use of high yielding adapted varieties from good seed, integrated pest management, plant nutrition based on healthy soils, and efficient water management.
- Soil health should be monitored as the level of biota and organic matter by establishing regulations for soil management.
- Farmers should be provided with access to genetically improved crop varieties that are resilient to climate change, pest, and diseases.
- R&D of such varieties should promote crop improvement and seed supply, improving policies and legislation for variety development and release.
- Sustainable agriculture would also require proper water management, and in turn, smarter, precision technologies for irrigation and farming practices.
- Crop losses could also be kept to a minimum by implementing crop rotations.
- Farming needs to be profitable by fixing minimum prices for commodities and providing “smart subsidies” on inputs, targeted to low-income producers.
- Incentive should be developed by policymakers to encourage farmers to use natural resources wisely and reduce the transaction costs of access to credit.

4.
STUDY APPROACH AND METHODOLOGY

SMEs now have to amend their business ways to be productive and maintain sanitary precautions at the same time (Sannegadu, 2021). Doing so will require the help of regulatory bodies, the government, and stakeholders. Prior to that, there is an urgent need to assess the before, during and post-COVID state of SMEs. A review of the current policies, regulations, schemes, and other parameters needs to be done and from there on, new policies, that will help and facilitate the productivity of SMEs, need to be proposed. For this study, the following methodologies were used:

4.1 REVIEW OF EXISTING MEASURES, SCHEMES, AND MEASURES

This involved a desk study on information pertaining to the SME Act, audit reports on SMEs, budgetary measures, and related parameters with respect to the Mauritian agro-industry. This led to the identification of gaps that concerned the agro-industry and helped with the formulation of recommendations to cater for improved policies/ frameworks for SMEs.

4.2 QUESTIONNAIRES DEVELOPMENT AND SURVEYS

The project revolved around two main investigations:

1. the status of the current policies and framework for SMEs and

2. the impact of COVID-19 on the agricultural sector.

Therefore, the most suitable approach identified was to conduct direct surveys. A total of 10 different questionnaires were developed to target specific issues and groups:

The gaps identified from the SME Act and various associated articles were framed into questions. The schemes that exist for the agro-industry were found to differ from sector to sector. This led to the preparation of 5 questionnaires with generalised questions (Appendix 1) and specific questions for each sector listed. The objectives of this set of questionnaires were to:

- Gather business information on the activities and characteristics of the participants in terms of product management from storage to sale, and compliance with regulations and standards.
- Determine the financial aspect of the business in terms of price determination, point of sale, among others.
- Identify the characteristics of the client/ customer relationship that exists.
- Determine the use of land for agricultural activities and the associated issues for any unused plots of land.
- Determine the awareness of the SME Act and policies and identify key factors that can boost business activities.
- Determine the awareness and acceptability of bio-farming and using technology as a utility for business improvement.
- Evaluate the awareness of sector-specific schemes, the factors that affect the number of applications and identify measures to increase the uptake.

The second set of questionnaires was framed to address the impact of COVID-19 on the SMEs in the agro-industry and consisted of 5 questionnaires, one per sector (Appendix 2). Similarly, some questions were sector-specific due to the nature of the respective activities. The objectives of this set of questionnaires were to:

- Gather information on the business activities in terms of animal rearing, vegetables grown, location of the farms.
- Evaluate the production status during the COVID-19 pandemic in terms of impact on production, accessibility to farms, accessibility to farm inputs and prices.
- Determine the status of sales during the pandemic and losses incurred.
- Evaluate the level of concern with respect to COVID-19 and the perception of changes that were induced by the pandemic.

The surveys were carried out in person using the online platform Survey Monkey. A target number of 100 respondents (all sectors combined) were anticipated to take part in the survey for each set of questionnaires.

The questionnaires were developed under the guidance of Ms H. Agulaba Ambi, UNIDO's Project Focal Point, Dr Sookar, Senior Principal Scientific Officer, Ministry of Agro-Industry and Food Security (MOAIFS) and Mr A. Goolaub, Acting Assistant Director at FAREI.

4.3 WORKSHOP TO ESTABLISH DIALOGUE BETWEEN PRODUCERS AND POLICYMAKERS

Establishing policies and/or developing new schemes require the input of various actors in the sector. A one-day technical workshop (consisting of 2 sessions) was held on the 12th of May 2021 at the Labourdonnais Waterfront Hotel in Port-Louis. The goal of the workshop was to present findings and suggestions from producers that were gathered from the surveys and then come up with plausible solutions and recommendations through collective discussions. The Chairperson of PAGE Green Recovery Fund National Steering Committee, Mr. M. Gunputh and Acting Assistant Director at FAREI, Mr. A. Goolaub were present at the workshop. The technical sessions, organised by UNIDO, under the Partnership for Action on Green Economy and Business Mauritius, were conducted by a team of UNIDO National Consultants, namely, Dr. V. Bhoyroo, Mr. R. Bhagea and Mr. P. Juddoo and Mrs. J. Bhandari, UN PAGE Mauritius National Coordinator.

Due to sanitary restrictions imposed by the government, only a limited number of participants could be invited; This led to an audience of 42 people, consisting of producers and policymakers. A total of 19 producers, planters, dairy and livestock farmers, beekeepers, and agro processors attended. The workshop was also attended by 18 representatives of relevant governmental bodies (Ministry of Industrial Development, SMEs and Cooperatives, (MOAIFS), FAREI, SME Mauritius Ltd, EDB), the private sector (ADMA, Suchem, LFL, Meaders) and NGOs (FALCON Association, ADMA, Regeneration Mauritius), all working with the Mauritian agro-industry.

The first technical session involved the delivery of the survey findings through 3 presentations representing specific sectors (planters and agro processors, dairy and livestock and apiculture). The second session consisted of the grouping of participants by sector, accompanied by policymakers to address the following objectives:

- Define key factors and potential threats to specific sectors (dairy and livestock, crop production and apiculture).
- Propose feasible schemes for developing sustainable local products (e.g., milk production and the transformation of milk into new marketable products with a better shelf-life, crop production and beekeeping practices).
- Propose methodologies/policies for farmers to manage their farms and sell their products in the case of a new pandemic/lockdown or similar level of catastrophe.

4.4 TIMELINE

The project involved various steps as described in the previous sections and Table 3 below offers a summary.

Table 3. A summary of the steps of the project.

Milestone	Activity	Timeline
Project start date		1st November 2021
Background search on grants and policies provided by government	• Review of government gazettes, budgetary speeches, and policy documents from the past 5 years. • Review of SME Act, 10-Year SME Master Plan and incentives proposed for the agriculture sector. • Review of grants and schemes offered by banks.	November 2021 to January 2022
Questionnaires to assess the adoption of grants, schemes and gather recommendations from producers & processors Questionnaires to assess the impact of Covid 19 on SMEs	• Delineating sectors within agro processors. • Vetting of the questionnaires by UNIDO and local agency.	January – February 2022
Conducting face-to-face interviews and gathering data through online questionnaires	Face-to-face interviews with: • Beekeepers, • Vegetable growers, • Cattle farmers & dairy producers, • Agro processors.	March – June 2022
Data processing and interpretation	• Data input in Excel. • Interpretation of results.	June – July 2022
Stakeholders dialogue through World Café	• Presentation of findings and proposals by producers. • Recommendations through technical sessions.	12th May 2022
Draft report	• Assessment and finalising of a draft report with institutional partners.	July - August 2022
Final report	• Vetting of final report. • Submission of final report.	October 2022

5.
REVIEW AND IDENTIFICATION OF GAPS IN THE SME FRAMEWORK FOR AGRICULTURAL ACTIVITIES

5.1 THE 10-YEAR MASTER PLAN FOR THE SME SECTOR IN MAURITIUS

In 2017, the Ministry of Business, Enterprise and Cooperatives launched the 10-Year Master Plan for the SME Sector in Mauritius following an intensive review of the existing SME framework. The project was launched as a mean to transform SMEs into innovative, sustainable, competitive (on a global scale), value-creating entities. The master plan envisioned SMEs as a key driving force to raise the GDP from 40% to 52% by 2026; raise SMEs' share of total national employment from 55% to 64%; increase exports to 18%; and increase the value addition from MUR 175 billion to 388 billion[20]. To reach these goals, 5 objectives were established:

- Objective 1: Improve SME competitiveness
- Objective 2: Foster high growth potential SMEs
- Objective 3: Upgrade skills and job opportunities
- Objective 4: Improve value addition
- Objective 5: Increase market share

The master plan already provides a critical review of the existing regulatory framework, deficiencies, and strategies with respect to the concept of SMEs. It also makes provision for a new development framework with comprehensive strategies formulated to address constraints and recommendations.

This current work will offer an insight into the proposed adjustments the plan requires, catering for SMEs, especially those in the agricultural sector. The master plan proposed actions for the improvement of SMEs based on sector growth drivers. The drivers aim at ensuring the effectiveness of the new proposed processes at 3 levels:

1. the export-oriented sector,
2. the domestic-oriented sector for consumer goods and services and
3. the creation of SMEs in emerging sectors that can then be considered as high growth potential sectors.

[20] Ministry of Business, Enterprise and Cooperatives: 10 - Year Master Plan for the SME Sector in Mauritius.

The government has already identified new sectors that require proper guidance and nurture SME start-ups. They were identified as 'bio-farming and value-added agribusiness', 'aquaculture' and 'renewable and green energy'.

5.1.1 Bio-farming and agribusiness

Most of the high value-added activities are dominated by large firms. SMEs are concentrated in farming activities such as cash and industrial crop plantations, and husbandry, horticulture, aquaculture, fisheries, and livestock, as well as low value-added processing activities. SMEs are involved in undertaking small-scale activities with a very low level of mechanisation and technology deployment, although in recent years efforts have been made to improve productivity. The emphasis will be on a greater deployment of technology and machinery as well as investment in R&D to improve efficiency, processes, and methods. Opportunities exist for agricultural products such as fruits, vegetables, fish, meat, dairy, eggs, herbal products, and seeds as well as in bio-farming. In addition, SMEs should take advantage of Mauritius as a strategic location for high value-added aquaculture farming and processing.

This sector has been divided into 3 categories based on the value chain of high growth potential sectors:

Low value-added	Medium value-added	High value-added
• Agro-processing activities • Dairy farming	• Agricultural biotechnology • Secondary agro-processing and food packaging • Extractions and value processing (rum, perfumes • Bio-farming; MauriGAP Standards	• Technology-based farming such as hydroponics, aquaponics, and vertical farming • Mixed farming techniques & permaculture

The framework established constitutes 9 High-Impact Initiatives (HII) which are listed as follows:

1. Rationalise institutional support framework and streamline regulatory procedures for SMEs.
2. Foster a culture of entrepreneurship and high- growth potential in SMEs.

3. Reduce skill mismatch.

4. Mainstream entrepreneurship into national education curriculum.

5. Foster emergence of high-tech and value addition SMEs.

6. Set up E-platform for SMEs.

7. Broaden SMEs abilities and options to obtain funding.

8. Strengthen SME capacities to penetrate domestic and foreign markets.

9. Expand gateway to African markets.

Each of these initiatives is further broken down into Key Actions and then into their respective main activities in time frames defined as short-, medium-, and long-term. This allows the proper monitoring of SMEs from the start-up moment to a fully operational organization. However, as mentioned earlier, the framework does not account for what to do in case of a state of emergency and does not specify what the procedure would be for specified sectors. SMEs operating in the field of agriculture would not necessarily face a national crisis in the same way as those in the manufacturing sector would.

Furthermore, agricultural production (especially in crop cultivation) is very sensitive to climate disasters and change such as droughts, cyclones, diseases, and pests, which can cause major losses. Between 2003 and 2013, 78 natural disasters occurred across the globe, causing a total of US$30 billion in terms of damages (droughts, floods, tsunamis, etc.) to agriculture (FAO, 2015). Such calamities may jeopardize the production and development capacities of the countries and lead to cascading negative effects on economies and thus the focus on food production is driven by food security concerns (Uitto & Shaw, 2016).

Taking all of these points into consideration as well as the fact that SMEs in this sector require to be properly guided through a more detailed framework, the HII and Key Actions that would directly be involved in SMEs from the agricultural sector were assessed and upon identifying gaps, recommendations were made as follows:

- **HII1: Rationalise institutional support framework and streamline regulatory procedures for SMEs.**
  - Include assessment of natural catastrophes for previous years and establish predictive measures.
  - Require the need of an Emergency Technical Team in moments of crisis that can provide solutions and procedures as required.
- **HII 2: Foster a culture of entrepreneurship and high growth potential in SMEs.**
  - Organise competitions between secondary schools and between tertiary education bodies to promote agricultural SMEs among youngsters.
  - Regular interviews of success stories and young entrepreneurs on national TV, radio, and newspapers to encourage agricultural entrepreneurship among youngsters.
  - Through joint collaboration between faculties and other research institutions, the University of Mauritius should come up with a proposal to encourage young graduates towards agro-processing with accent given to training on day-to-day management, marketing, entrepreneurship, agro-processing technology and product development.
- **HII 4: Mainstream entrepreneurship into the national education curriculum.**
  - Promote agricultural activities and awareness in education from primary to upper secondary levels.
  - Include practical activities with respect to farming and food processing.
  - Initiate career guidance activities from secondary school on to promote SMEs and agriculture.

- **HII 5: Foster emergence of high-tech and value addition SMEs.**
  - Promote research for direct application, i.e., research targeted towards reduction in food loss, yield improvement (e.g., creation of crop hybrids for disease and pest resistance and high yield hybrids).
  - Promote the consumption of local food in case of state of emergencies to avoid food loss and wastage through Farm to Fork Strategy.
  - Decrease the number of actors in the chain from producer to consumer to increase the profits for producers.
  - Adopt new technology and strategies and thus further costs which could be reduced by stakeholders.
- **HII6: Set up E-platform for SMEs.**
  - Promote the use of user-friendly mobile applications and provide training/guidance for the use of such technology, as farmers are not necessarily familiar with modern technology.
- **HII 7: Broaden SMEs abilities and options to obtain funding.**
  - Identify funding sources to provide as concessions to SMEs in case of emergency.
  - SMEs in agricultural sector should be defined on a specific scale to assess the financial aid requirements separately.
  - There is a need to encourage a diversification of activities and encourage private companies to invest in them. Awareness must trigger investors and they must be helped to find producers as partners or contract growers.
- **HII 8: Strengthen SME capacities to penetrate domestic and foreign markets.**
  - Need for more public campaigns from health sectors, government bodies, teaching institutions on the health benefits of nutritious foods rather than cheap ultra-processed and nutritionally poor commodities.
  - Encourage food producers to follow food safety standards to ensure good quality products.
  - In case of rapidly perishable food commodities, provision of refrigerated transport facilities to ensure maximum quality of products.
  - There is a need for more robust economic agreements between governments in order to gain access to foreign markets, with particular attention to the African markets, due to their proximity.

Gaps identified in agribusiness that require Sectoral Interventions (SA), especially during crisis, were identified and the following recommendations were elaborated:

- **SA1: Capacity building for agribusinesses**
  - Proper training (from experienced foreign as well as local experts) on new agro-processing methods and new food product development is needed.
  - Should prioritise food crops production for local consumption to decrease dependency on imports.
  - Need to farm hybrid crops that are robust and produce better yields and high growth rates.
- **SA2: Secondary and advanced agro-processing**
  - Should increase public awareness of the benefits of eating local produce and the health attributes of fresh products.
- **SA3: Pack houses as logistics and value adding partners for small, engaged farmers**
  - In moments of crisis, the accommodation sector does not take supply. Products should be channelled towards local communities to avoid food loss, wastage and to still generate income.
- **SA5: Move towards ethical and sustainable dairy**
  - Milk sector requires particular attention due to its current rapid declining production status.
  - With increasing imported milk prices, local producers should be equipped to better market their products and take over more shelf space.

5.2 CRITICAL ANALYSIS AND REVIEW OF BUDGETARY MEASURES AND POLICIES TO HELP SMES IN THE AGRO-INDUSTRY

5.2.1 Performance Audit Report (June 2020)

Food Production – Optimal use of Agricultural State Lands (ASL)[21]:

The objective of the audit was to assess whether the agricultural state lands were efficiently and effectively managed and employed for agricultural development by the Ministry of Agro-Industry and Food Security (MOAIFS) (review spanned from January 2012 to December 2019). The report provided recommendations on areas of improvement in the management and monitoring of the state land leased for agricultural development.

Proper land management is essential for the survival of the agro-processing industry. In Mauritius, agricultural lands are mainly used for sugarcane, tea, food-crop, and livestock production. The MOAIFS manages agricultural land through its Land Use Division (LUD). Loss of agricultural land is a major problem that the agricultural sector faces. As more land is lost it will become more difficult to produce the amount of food needed to feed the population in addition to other influencing factors such as capital, manpower and knowhow, among others.

In January 2016, the MOAIFS noted that significant land areas had been moved out of agriculture to make way for other development, such as urbanisation. This trend has continued to date. Areas for harvesting crops have been decreasing by some 1,700 hectares (ha) per year since 2016. Policies implemented in the agricultural sector to achieve food self-sufficiency have had limited success. Overall, incentive measures put in place did not produce the expected results. Mauritius has long been, and remains, a net food importer.

[21] National Audit Office (2020). 'Performance Audit Report. Food Production: Are Agricultural State Lands Optimally Utilised?' *Ministry of Agro-Industry and Food Security.* Available at: <https://nao.govmu.org/Documents/Reports/2020/Food%20Production%20-%20Are%20Agricultural%20State%20Lands%20Optimally%20Utilised.pdf>

5.2.2 Key findings of the audit reports

From the reports, major findings could be retrieved which led to the identification of specific situations resulting from a lack of monitoring from the LUD such as leased plots being unused to land allocation being done through obsolete criteria, among others[22]. Proposed recommendations for land use are as follows:

- Demarcated and reserved areas for agricultural production.
- Incentives to re-convert abandoned land for agriculture.
- Thorough review of available agricultural state land and their open and transparent leasing to local and international investments for agricultural endeavours.
- Need for a systematic and scientific monitoring of land resources by the LUD.
- Terms of lease to be reviewed and should cater for possible catastrophes in the agreements.
- KPIs could be used to assess lessees and encourage long-term involvement through incentives (e.g., reduced cost for land).
- Selection criteria for allocation of ASL should be reviewed in consultation with farmers' representatives, NGOs, and cooperatives.
- LUD should work in close collaboration with the various stakeholders like FAREI, Mauritius Cane Industry Authority, Sugar Insurance Fund Board and National Agricultural Products Regulatory Office to set the minimum performance levels in the different agricultural sectors in which lands are given on lease.
- Establishment of a digital platform supported by proper GIS maps would greatly enhance future monitoring.
- Re-invigorate the workforce for improved services.
- Legislation to regulate organic agriculture/bio-farming is required.

[22] National Audit Office (2020). 'Performance Audit Report. Food Production: Are Agricultural State Lands Optimally Utilised?' Ministry of Agro-Industry and Food Security. Available at: <https://nao.govmu.org/Documents/Reports/2020/Food%20Production%20-%20Are%20Agricultural%20State%20Lands%20Optimally%20Utilised.pdf>

- More suitable regions for organic farming should be identified around the island.
- Ministry must set up appropriate infrastructural facilities at the dedicated bio-farming zone to prevent promoters from abandoning their land.
- Selection criteria for allocation of ASL should be reviewed.

5.2.3 Review of government budgetary measures (2020 to 2023)

Under normal conditions, changes or interventions that are deemed necessary are treated by the government and if they incur a financial aspect, they would be presented to the public through the National Budget Speech at the beginning of each financial year. From 2020 to 2021, many economic sectors suffered from drastic changes in their activities. The National Budget offers a preliminary plan and the state of mind of the government with respect to the current situation, what they intend to do and how. For the agricultural sector (including SMEs), this is where major projects, partnerships, schemes and facilities are put forward. This is also the moment where policies and measures discussed among institutions are validated by the government. Here, we present the significant data pertaining to agriculture and SMEs.

Measures included a food security plan through the inception of the National Agri-Food Development Programme; the management of land use for agricultural activities; management of the national wholesale market; setting up of an Agro-Processing Zone and the establishment of financial aid due to COVID-19, among others (Appendix 3).

5.2.4 Bio-farming: Legislations and agriculture state land

As of 2016, the government decided to encourage farmers to minimise the use of synthetic agro chemicals and shift towards bio-food production due to increasing public concern for food safety and the increasing rate of cancer cases registered in 2015. The Ministry of Agro-Industry and Food Security (MOAIFS) proposed several measures to achieve the government's vision for bio-food in its Strategic Plan 2016-2020. Policies were geared to promote the shift from conventional farming to an environmentally sustainable and safer mode of food production by facilitating access to state land. The government planned to place 100 ha of land at the disposal of planters to establish model bio-farms. The Bio-Farming Promotion Scheme was introduced in 2016 to encourage a gradual shift towards bio/organic production through sustainable production practices, thereby, minimising the use of synthetic fertilizers and pesticides.

There are currently no specific laws on bio-farming. New legislation for organic agriculture/bio-farming covering all aspects of organic farming is necessary to regulate this sector and recommendations should be made for an effective organic certification setup. In this way, an appropriate institutional framework and inspection systems will be built. The government will be able to optimize the use of agricultural land to achieve sustainable levels of food self-sufficiency while considering related environmental and social considerations. As of December 2019, there was still no legislation on organic farming. The absence of legislation did not allow the MOAIFS to set the criteria to assess ASL's suitability, which was a prerequisite for organic farming.

A sum of Rs 20 million was provided in the budget for 2016-17 for the setting up of an exclusive bio-farming/organic zone with comprehensive modern infrastructural facilities at Britannia. However, the MOAIFS did not put in place facilities such as water supply, a buffer zone, fencing and better access to the site. As of December 2019, no other regions were identified for organic farming as initially planned by the MOAIFS to place 100 ha at the disposal of planters.

5.3 SCHEMES PROPOSED BY ORGANIZATIONS IN MAURITIUS FOR THE AGRO-INDUSTRY

The provision of schemes and policies is a crucial component that helps sustain the activities of SMEs. Due to the plethora of sectors that exist, each of them is attributed to and governed by specific institutions or parastatal bodies. In the agro-industry, the most prominent institutions would be FAREI or the SFWF under the MOAIFS. Other institutions include the SME Mauritius Ltd, the Agricultural Marketing Board

(AMB) and the Development Bank of Mauritius (DBM). They are tasked to act as facilitators to the industry by providing not only technical or administrative aid but also financial aid (funds delivered by the government). In this section, we present the various institutions that provide such assistance and the respective schemes that concern the agro-industry (Appendix 4).

5.3.1 Ministry of Agro-Industry and Food Security

Parastatal bodies: FAREI, SFWF, AMB

As per the FAREI Annual Report, during the period 2019/2020, the following applications under the different schemes were processed; 16 'Sheltered farming', 16 'Rainwater harvesting', 53 'Purchase of agricultural/processing equipment' (crop), 2 'Purchase of equipment' (livestock), 41 'CCTV camera' and 1 'Cattle breeding' were processed and examined.

More than one hundred and one million rupees have been disbursed to 677 beneficiaries of the above-mentioned schemes since their inception in 2014. For the financial year (July 2019 to June 2020) MUR 12,606,128 have been disbursed to 76 beneficiaries and 271 field visits have been carried out to monitor these schemes during the same period. A total of 65 applications have been processed and evaluated under the Biotechnology Loan Scheme of the Development Bank of Mauritius (DBM).

Livestock Production and Development Programme:

Over the last decade the MOAIFS has introduced several schemes under the Livestock Production and Development Programme. The aim is to boost the local production and marketing of milk, meat, poultry, and related value-added products, thereby increasing food self-sufficiency. Eight schemes have been set up to cater for modernisation and innovation in the livestock sector by providing technical and financial assistance to the farming community so that the latter may operate in a more conducive environment. Seven of these schemes are managed by the FAREI and one by the Small Farmers Welfare Fund (SFWF).

As per the Audit Report for the financial year 2018/19:

- The MOAIFS acceded to the claims of FAREI without taking into consideration the amount retained by the latter under the different schemes. Only Rs 37 million of the Rs 87 million distributed by the latter to FAREI was paid to beneficiaries.
- Disbursements of funds to beneficiaries were much lower than the budgeted amount.
- There has been a decreasing number of breeders in the livestock sector and animal population over the past five years.

As of 31st October 2019, four of the eight schemes were on-going, namely 'Pasture Development', 'Purchase of Agricultural/Processing Equipment', the'Upgrading of Livestock Farm/Poultry Scheme' and 'Calf Productivity Scheme/Heifer'. For the year 2018-19, only two applications were received for the Pasture Development Scheme. However, no disbursement has been completed. Through the 'Purchase of Equipment (Livestock) Scheme', payments of Rs 930,000 were effected to only 4 beneficiaries; payments of Rs 1,450,000 were effected under the 'Upgrading of Livestock Farm/Poultry Scheme' to 8 beneficiaries and payments amounting to Rs 980,000 were made to 209 beneficiaries under the 'Calf Productivity Scheme/Heifer'. The total number of beneficiaries was therefore relatively low.

Regarding three of the four remaining schemes, namely the 'Cattle Breeders Scheme', 'Goat/Sheep Farm Scheme' and 'Reproduction Farm (Pig)', no disbursement has been made during the past three financial years (ended June 30, 2019), while for the 'Reproduction Farm (Cattle/Goat) Scheme', land was being identified in a suitable region for the setting up of a farm. No disbursement was therefore made in the financial years 2017-18 and 2018-19.

5.3.2 SME Mauritius

SME Mauritius Ltd is a private company, owned by the Government of Mauritius that facilitates and supports the development of entrepreneurship in the country. For the financial year 2020-2021, the company has approved a sum of Rs 32.6 million for a total of 732 projects benefitting 635 SMEs including those from the agro-industry. The 'Technology and Innovation Scheme', aimed at the acquisition of machinery and equipment, development of mobile apps,

etc, were applied to by 552 beneficiaries, where 13% were from agrobusiness[23]. As per the FAREI Annual Report 2018/19, 35 projects engaged in agribusiness activities have been examined, assessed and feedback has been sent to SME Mauritius Ltd.

5.3.3 Mauritius Chamber of Agriculture

The Smart Agriculture project aims at accompanying the Mauritian agroecological transition. The main goal is to promote a well-reasoned mode of production that will allow general agriculture in Mauritius to move towards more sustainable and resilient systems in the face of climate change. In that regard, the management of inputs (pesticides, fertilizer, water) is optimized and alternative techniques (traps, biodiversity, rotation) are implemented by adjusting them to the proper context and situations present at the field level. These production systems, with the necessary traceability, will allow for the reduction of residues of plant-health products all the while taking into consideration the expectation of healthier products for the consumers as well as the need to respect the environment. The project also aims at maintaining or enhancing the economic results for the farmers while ensuring their productivity.

[23] Government of Mauritius. (2021-2022).'Budget Debates'. Available at: <https://enterbusiness.govmu.org/Pages/Speeches%202021.aspx>

The insular and tropical context of Mauritius makes vegetable production and the fight against pests and diseases of crops complex and has led planters to use pesticides excessively. This situation has been aggravated by the observed and potential effects of climate changes such as an acceleration in the growth and propagation of pests and disease carriers and a decrease in soil humidity. As a means of addressing those challenges, the MCA, in collaboration with the FAREI and with the scientific and technical support of CIRAD Reunion, has set up the Smart Agriculture project.

Through a structured and collective approach, this project proposes to accompany a network of producers in a stepwise process of re-designing their cultivation systems. It is based on the hypothesis, shared by the scientific communities, that the transition from the current agricultural systems to agroecological systems will increase the resilience of our agriculture in the face of climate change. These changes will also, in the long-term, mitigate the negative impacts on the environment. The agroecological transition of these systems should also help in reducing the use of pesticides on cultivation, diminishing the sanitary risks that are linked to pesticide spraying and to the subsequent consumption of these vegetables.

6.
SURVEY ASSESSMENT – REVIEW OF CURRENT POLICIES AND SCHEMES

Based on the information generated in previous sections, various gaps were identified in the current policies that govern the SMEs in the agro-industry. To offer technical support to those SMEs, it is imperative to firstly understand their mode of business operation, grasp their understanding of the current policies in terms of the SME Act, land use, bio-farming and finally their knowledge of schemes offered across various organizations (public and private institutions) related to their field of business.

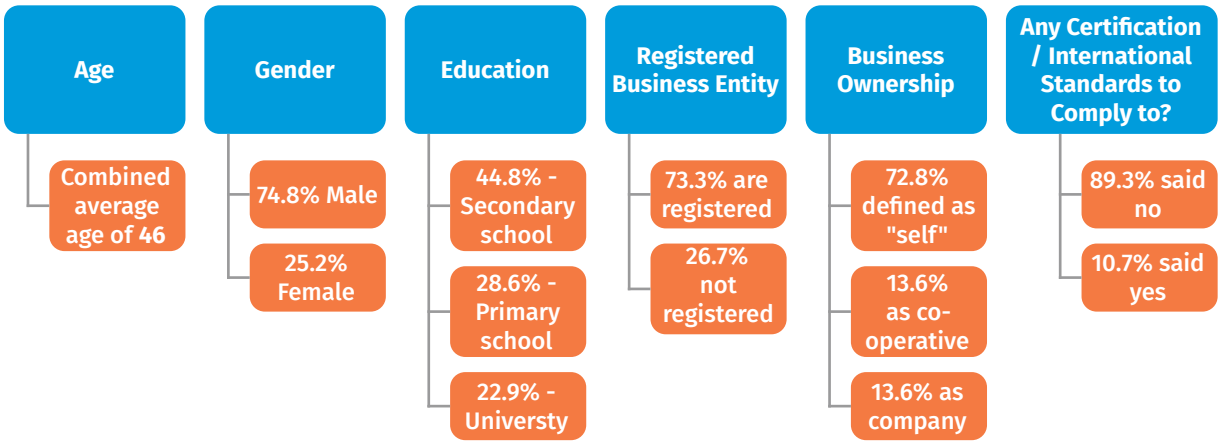
Therefore, a questionnaire was developed, and a survey was conducted to identify the current environment that SMEs operate in, with data that covers all sectors of agribusiness, while others are specifically industry-related such as livestock production, planters, beekeepers, etc. A total of 107 businesses that fall into the category of SMEs participated, consisting of 43 planters, 31 dairy and livestock farmers, 18 agro processors/middlemen and 15 beekeepers.

6.1 GENERAL FINDINGS

6.1.1 Background and business information

The first findings of the survey conveyed specific information on the population that performs in the agro-industry (Figure 3). The first aspect that was reviewed was the age of the respondents from this economic sector. The survey revealed an aging population in the industry. Furthermore, the gender distribution captured in this study indicated that the agro-industry is patriarchal. The majority had an education at the secondary level and a high percentage registered their businesses as 'self '. Additionally, it was found that 26.7% of the respondents did not register their activities as a business entity. However, when it comes to regulations/standards/certifications (e.g., MauriGAP, HACCP) 89.3% acknowledged not needing to comply with any of them.

Figure 3. Basic information on the respondents.



6.1.2 Financial aspect of business

This section was found to be highly influenced by various factors, including human interactions and behaviours, which had an underlying influence on the final decisions. However, the influence of authorities was not perceived much in the decision process. For example, price establishment in the sector was primarily defined by a 'Settled price ', followed by 'Negotiation' (Figure 4). The major factors that influence the range of the prices are 'Other vendors' price' and 'Buyer's demand'.

6.1.3 Client/customer relationship

The human factor was very noticeable when asked about factors influencing the choice of clients and/or suppliers (Figure 5). This is further evidenced through the notion of contract establishment. Most respondents chose to trust their clients/suppliers based on at least some trust to formalise verbal agreements. The concept of trust was also found to be linked to the aspect of quality assurance of products, although a few denoted them as independent factors.

Figure 4. Main findings on business operations (financial aspect).

Determination of Prices	• Settled price: 46% • Negotiation: 35% • Bidding: 13% • Other: 6.0%
Factors Influencing Price Determination	• 39.2% Other vendors' price (competition) • 25.5% Buyer's demand (negotiation) • 13.7% Amount of produce harvested • 9.8% Transportation cost • 3.9% Time of the year • 7.8% Other
Profitability of Point of Sale	• By consumers directly : 89% more profitable • By wholesalers: 55% less profitable • By retailers: 51% less profitable
Delivery of Payment	• 82.4 % paid on delivery of goods • 17.6 % perceive a delay in payment (credit)

SMEs tend to opt for direct trade with clients thus allowing prices to be determined by them. The presence of middlemen (the bulk farm gate buyers) is detrimental to farmers as they perceive low profits (Oguoma et al. 2011). However, COVID-19 has allowed producers to engage more profitably in dual points of sale with both direct clients and wholesalers/ middlemen.

Figure 5. Findings pertaining to the concept of client/customer relationship.

Factors Influencing Choice of Suppliers	• Trust: 32% • Quantity assurance: 22% • Price: 22% • Payment facility: 10% • Product assurance: 6% • Other: 8% (mainly quality assurance)
Type of Contract	• 97% opt for verbal agreements over written contracts or legal documents
Level of Trust Through Agreements	• 58.1% showed full trust • 39.0% indicated some trust • 2.9% indicated little to no trust

Trust holds a lot of importance for a variety of societal relationships. It facilitates trade, which increases prosperity and induces interactions with people/ traders of different origins, leading to benefits to all parties (Anomaly, 2017). In Mauritius, this is an integral part of agreements between producer and clients as seen with the high level of verbal contracts vs. written contracts.

6.1.4 Land use for agricultural practices

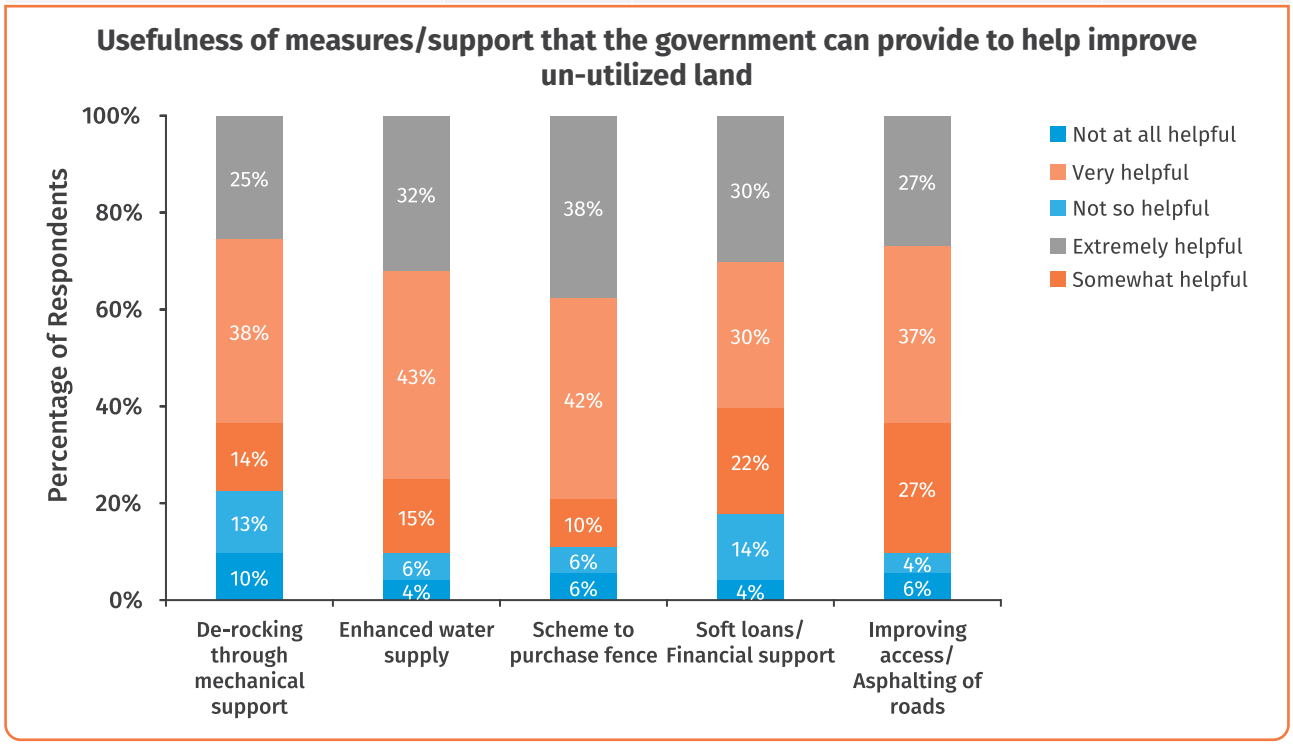
All agricultural practices require a minimum surface area of land to carry out their activities. Therefore, questions were formulated to acquire enough information on the status of the availability and use of land for agricultural activities. The targeted respondents were beekeepers, dairy and livestock farmers and planters. It was found that the two main sources of land came in the form of inherited family plots and rented land from other owners (Table 4). However, it was also observed that only 33% of the respondents possess un-utilised land. Some measures that could be provided by the government would be enhanced water supply and schemes to purchase fences as most respondents complained of water shortages and theft.

6.1.5 SME Act and its related queries

The set of questions in this section were aimed at understanding whether the agro producers knew of the SME Act and based on what it relates to, how they perceive their business at present and in the future (Figure 6). However, it was observed that more than half of the participants were unaware of the SME Act and the policies and schemes available for SMEs. Furthermore, only 11.3% mentioned that they benefitted from any such schemes and most of them (86.7%) do not get enough support from the government.

Table 4. Status in the usage of land, the associated constraints and usefulness of potential measures.

Source of Land for Agricultural Activity		Constraints for Agricultural Activities	
Inherited family plots	**43.7%**	**Labour shortage**	**24.1%**
Leased from government	20.4%	**Financial constraint**	**20.4%**
Rented land from private	20.4%	Water shortage	9.3%
Purchased land	13.6%	Accessibility	9.3%
Through cooperative services	6.8%	Theft	9.3%
Others	4.9%	Land arid/ marginal	3.7%
		Others (electricity supply, storage issues, flood prone areas)	**24.1%**



The respondents also evoked their willingness to expand and/or diversify their business activities. The majority responded positively to suggestions in this regard, particularly for technical support, the provision of training on quality assurance and assistance to access broader internal markets.

An important point to consider in agricultural practices is who to contact in case of disasters/catastrophes. In this case, 61.0% responded that they did not know to whom they should direct themselves. However, those who did know mentioned institutions like FAREI, Entomology Division Unit, the Ministry of Agro-Industry and Food Security (MOAIFS), Catastrophic Division Unit, SFWF, Division of Veterinary Services and expert farmers/producers. Advice from such institutions or experts was deemed useful to 58.7% of the farmers. The opposing population was primarily driven by the livestock and dairy sector regarding the Division of Veterinary Services.

6.1.6 Bio-farming

The concept of bio-farming is a much desired type of farming due to the various benefits it generates (Buragohain, 2020). Defining this farming practice is not straightforward because each country has its own parameters. However, the general concept of bio-farming also referred to as 'organic farming', is that it is a system that relies on ecosystem management rather than external agricultural inputs. The system takes into account potential environmental and social impacts by eradicating the use of chemical/synthetic inputs (synthetic fertilizers, pesticides, veterinary drugs, GM seeds, etc.). Alternatives to such inputs include site-specific management practices (use of organic compost, regular maintenance/cleaning of farm premises to avoid pest proliferation, use of organic certified pastures for grazing and feed composed of organic materials, etc.) that maintain and increase long-term soil fertility and prevent pests and diseases[24].

However, in Mauritius, this initiative is still in its growing stages. Therefore, a primary assessment of the local consumption of organic products is necessary. The participants were asked whether the government is doing enough to promote consumption of local products, to which 66.4% believed there is not enough promotion (Appendix 5). Nonetheless, a vast majority of the farmers were aware of what bio-farming meant and quite a few were willing to implement such practices in their business operations (Figure 7).

Figure 6. Survey findings related to the SME Act queries.

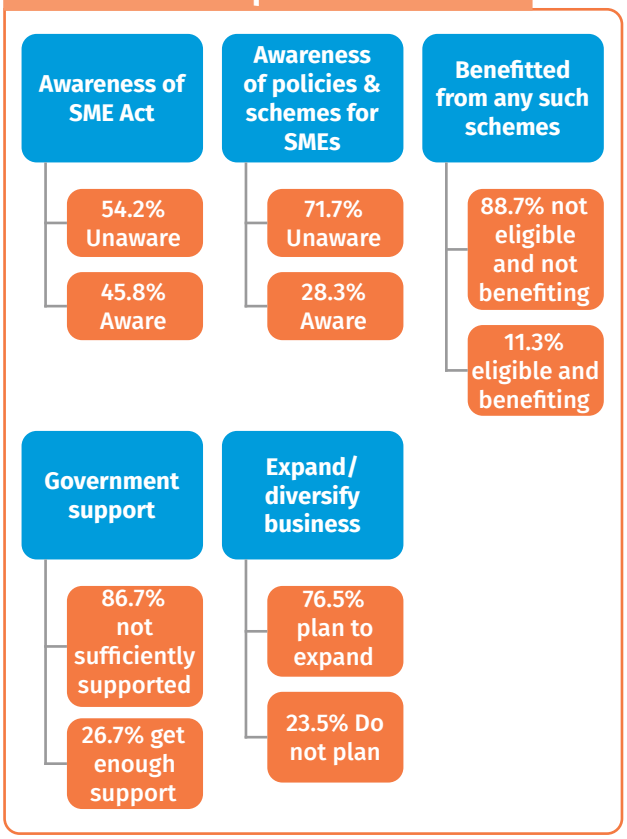
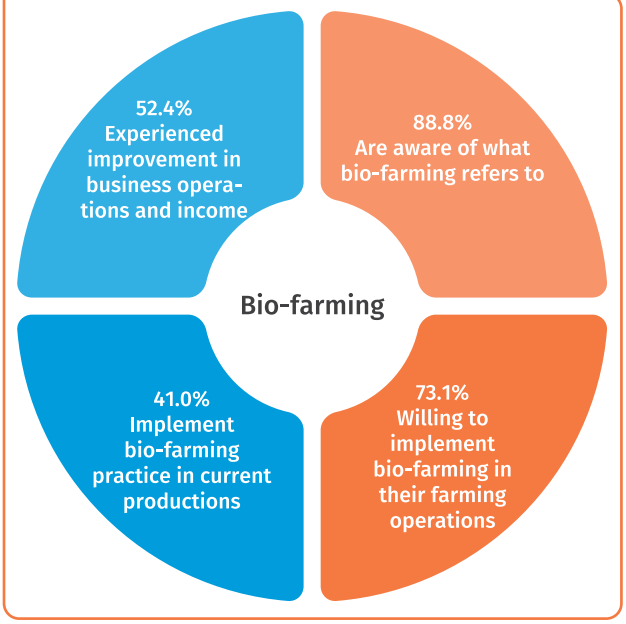


Figure 7. Current views on bio-farming in terms of awareness, usefulness, and acceptance.



[24] FAO. 'Organic Agriculture'. Available at: <https://www.fao.org/organicag/oa-faq/oa-faq1/en/>

To successfully implement bio-farming, changes must be made within the current practices and instilled in future generations. However, the farmers (**61.5%**) have seen an alarming decrease in interest among the younger generations in agricultural practices. They attributed this situation with the following comments:

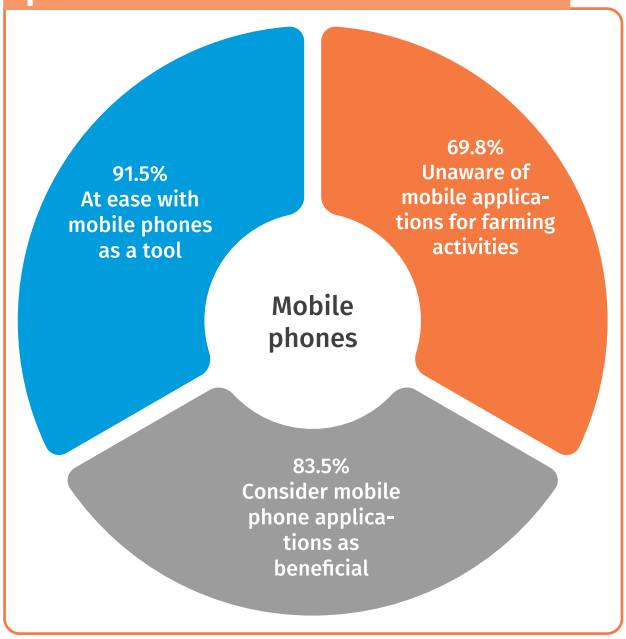
- "Most youngsters do not want to work the soil. They find it too difficult. Also, parents' and relatives' mindsets tend to block them by saying, "Will you work as a planter? Work in an office".
- Youth is not interested in traditional farming. They would prefer mechanisation, computerisation, and use of mobile applications, new approaches and techniques of production: sheltered farming, hydroponics, aquaponics, NFT, vertical farming."

More comments are available in Appendix 6.

6.1.7 Technology as a utility

With the continuous changes and progress that occur in the field of technology, various sectors automatically opt for the latest products to improve their production chains. One of the simplest and most easily available tools on the market is the mobile phone. Considering that farmers are always on-site tending to their crops or animals, it would be difficult and time-consuming to go in search of information, manage their administrative work as well as their farms. Applications could act as facilitators to such an endeavour.

Figure 8. Representation of the acceptance of mobile phones and applications as a guide for improving production.



It has been observed that over 90% of the respondents were at ease with the use of mobile phones as a means of guidance for improving their production (Figure 8). However, a high percentage were unaware of applications that could provide such assistance (e.g., Mokaro). Additionally, they deemed such applications as beneficial to their business operations and proposed features that could be taken into consideration.

Other features that farmers deem useful are:

- An application to manage stock, count income and the cost of production. Giving statistics on profit and losses and recording capital, investments, and expenditures.
- Availability of price and/of products (vegetables, animals, etc) on sale across the island.
- Difficulties of farmers based on specific vegetables and solutions to problems. New trends and up to date information related to the sector.
- Loss of hives - GPS monitoring. Steps to follow in the management of bees and harvesting, and how to tackle small/frequent daily issues.
- Advice on production management, what to do and what not to, how to improve production.
- Marketing from application to social platforms such as Facebook and Instagram.
- Information on the status of the animals with respect to daily harvests, reproduction cycle, medical history, etc.
- Access to veterinary services, availability of veterinary officers and information on disease management.
- Ordering system for clients and for purchases.
- Information from the government/ministry directly such as schemes, etc.
- Weather forecast, best deals for purchase of seeds/fertilizers/pesticides.
- Network among producers, retailers, processors. Access to advertising facilities.

6.1.8 Knowledge on schemes

Institutions such as FAREI, DBM, and SME Mauritius, among many others, are facilitators of business creation, development, and improvement. This is possible through schemes that allow beneficiaries to have access to financial assistance. However, not all schemes are sector-specific and not all are tailored to farmers' needs. It is an even worse scenario when the existence of schemes does not reach the target audience. This was observed through this survey, where less than 50% of the participants had knowledge of the schemes and even less than 10% were beneficiaries of schemes targeting them (Appendix 7). On the other hand, the schemes proposed by the DBM are well known by the actors in this industry, while the SFWF are less known (62.1% vs. 53.9%) but have been beneficial to some extent to farmers in the dairy and livestock sector (e.g., Heifer Productivity Incentive Scheme).

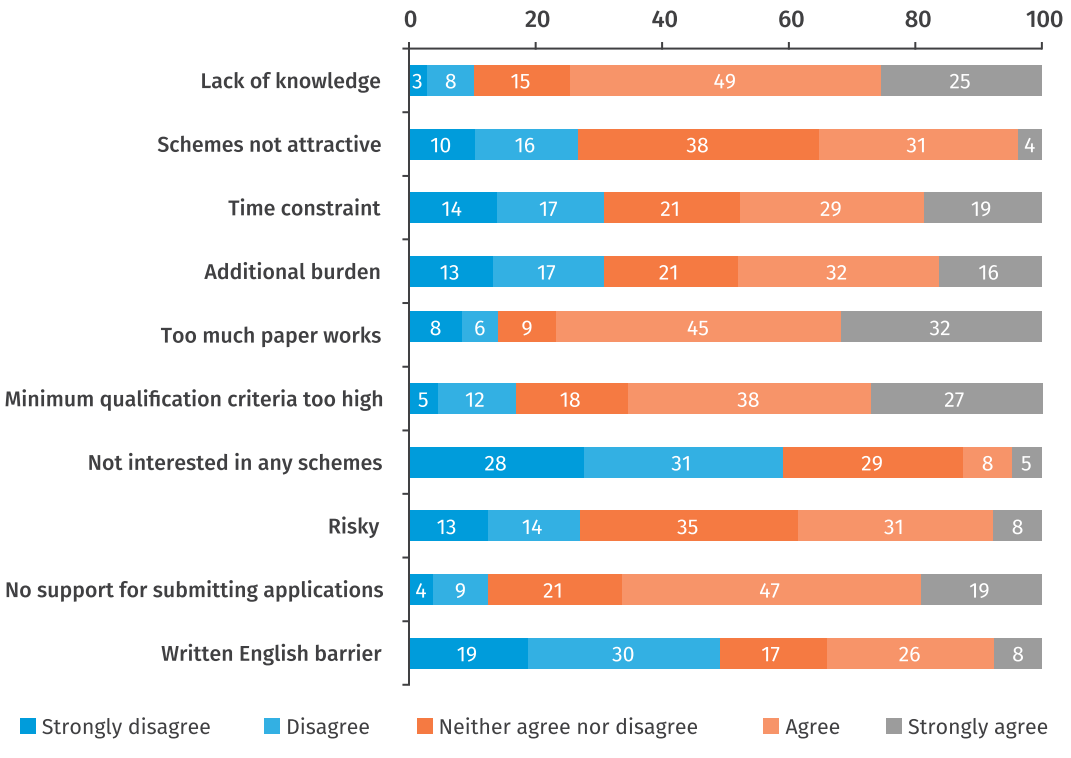
The participants were further asked about the factors that discouraged them from applying for a scheme (Figure 9). The most distinguishable ones would be the lack of knowledge[25], too much paper/administrative work and the minimum qualification criteria being too high to make the farmers eligible. They also strongly evoked a lack of support during the application process.

This section also took some aspect of the COVID-19 crisis into consideration to cater for future situations of similar magnitude. The participants were asked whether policies and schemes proposed by the government have helped them in difficult times, to which only 18.2% responded positively, providing the following reasons:

- Providing an alternative job
- Obtaining loans, assistance on how to operate

[25] Knowledge does not only refer to information on schemes but also on their existence.

Figure 9. Agreeableness (%) on factors that discourage farmers from applying for schemes.



- Farmers are already benefitting from loans and subsidy
- Grant to producers which helped financially
- Benefited from the wage allowance scheme during lockdowns
- From SFWF: Proposal to buy equipment at 50% of the price
- Provision of seedlings (e.g., chilli, beans)
- MRA aided financially
- Compensation for losses has helped slightly
- Insurance & subsidy - Post flooding conditions/ bad weather/ cyclones

As mentioned previously, the questionnaires also focused on sector-specific aspects of the businesses. Such findings are presented in Appendix 8 and give a detailed assessment of the mode of operation of agribusinesses.

7.
SURVEY ASSESSMENT – IMPACT OF COVID-19 ON SMES IN THE AGRO-INDUSTRY

The onset of the COVID-19 pandemic has had an impact on the productivity and existence of many SMEs in various sectors. It was perceived in various ways, to extremes such as the complete shutdown of the business. Understanding how the agro SMEs reacted to the pandemic and coped with the imposed restrictions to maintain their activities was deemed necessary. Such information is also crucial in the implementation of specific regulations and policies in case new catastrophes of similar magnitude were to occur again. Therefore, a second questionnaire was developed, and a survey was conducted to identify the impact of COVID-19 on SMEs operating in the agro-industry. A total of 104 participants were recorded consisting of 38 planters, 34 dairy and livestock farmers, 16 agro processors/middlemen and 16 beekeepers.

7.1 GENERAL FINDINGS

7.1.1 Overall business data

The first findings of this survey concerned the characteristics of the businesses, which would be useful information in understanding the mode of functioning of the latter. Such data offers visibility on the various steps involved in the production such as ownership, business site, annual turnover, etc.

A great percentage of the respondents indicated that they referred/registered their businesses as 'self' and had an annual turnover that was less than Rs 500,000 (Figure 10). Furthermore, 61.5% considered their business as a full-time employment and a similar percentage reported that their business sites (plantations, farms, processing plants, etc.) were far from their residence and thus required a means of transport to reach them

7.1.2 Impact of COVID-19 on agro businesses

Following the onset of COVID-19 and the different imposed sanitary conditions/measures, 80.4% of the respondents noted an impact on their business operations. Although 64.7% judged the impact as negative, 16.7% found the restrictions beneficial. Among the sectors investigated in this survey, apiculture was found to be most stable based on the nature of the activity. The other sectors, however, faced multiple difficulties (Figure 11) that caused decreases in their productions (Appendix 9). Once the government launched the Work Access Permit (WAP), 51.5% of the farmers/producers sent their applications and 90.9% were successful in the process.

Figure 10. Basic information concerning businesses in the agro-industry.

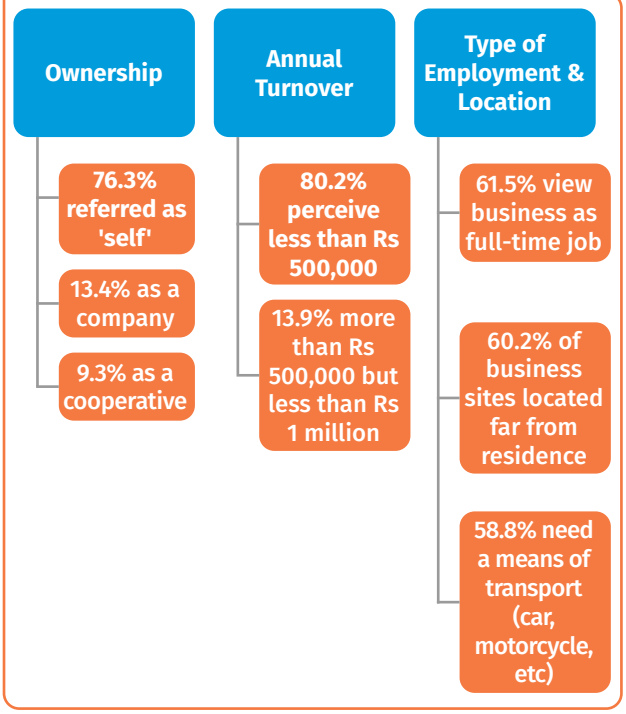


Figure 11. Factors that caused a decrease in normal farming/ productions activities.

Agro-Processing	• 75.0% could not sell their products • 46.7% could not have access to business site • 26.7% did not have access to agricultural raw materials
Dairy & Livestock	• 57.9% could not have access to fodder as feed • 36.8% could not maintain regular milking pattern • 31.6% could not access their farms
Planters	• 61.8% failed to sell their harvests • 51.4% could not access their plantations • 55.6% could not harvest their crops

Apart from the factors that impacted the business operations, others also hindered the usual course of activities. Across the different sectors, the following factors were considered from slightly to significantly impactful (Figure 12):

- A lack of sales points such as markets or even access to customers.
- Forced disposal of processed/harvested products (including milk, crops, etc).
- Access to working capital was detrimental (cash flow was stopped).
- Farm inputs (feed, fertilizers, seeds, etc) were unavailable.

Other factors such as the closure of food processing facilities/ companies and manpower on sites, did not account for much of the negative impact.

7.1.3 Resumption of activities

Once businesses were allowed to operate under the sanitary restrictions, there was a difficult relaunch of activities across all sectors[26]. Due to a long period of forced inactivity, businesses had to implement radical changes to their modes of functioning. The same trend was seen in the agricultural sector. Some 50.0% of the respondents increased the prices of their products and recorded an extensive decrease in sales (Figure 13). Furthermore, since agricultural products are rapidly perishable if not conserved properly, farmers incurred significant losses (77.6%). The majority

[26] Business Mauritius and Statistics Mauritius (2020). 'Report on the Impact of COVID-19 on Businesses'. Available at: <https://www.businessmauritius.org/wp-content/uploads/2020/12/BM_Report-on-Impact-of-COVID-19-on-Businesses_Dec-2020.pdf>

Figure 12. Influential factors that were impactful on business operations.

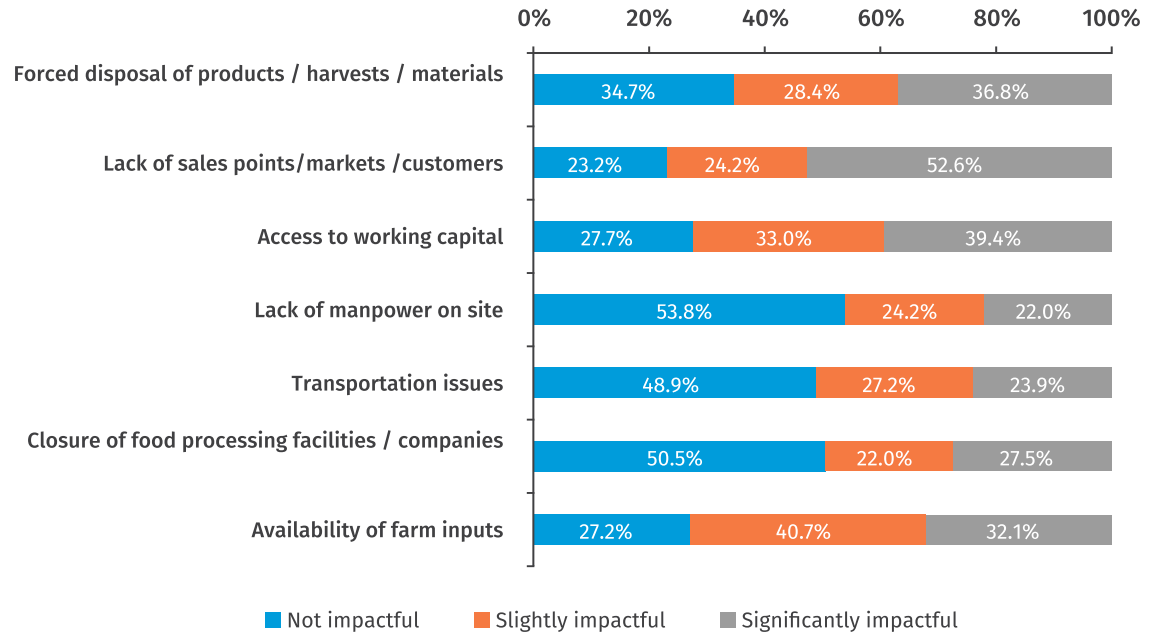
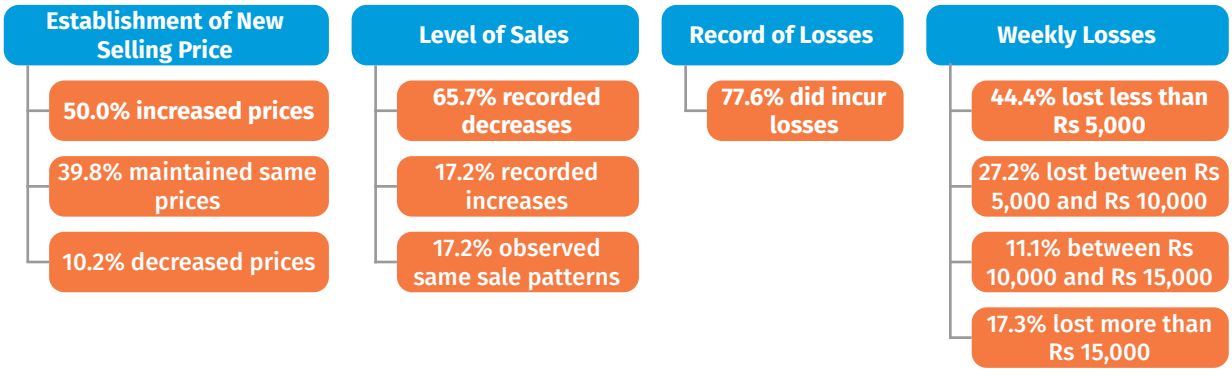


Figure 13. Characteristics of business operations post sanitary curfew.



observed losses of not more than Rs 5,000 per week, which is considerable based on their normal annual turnover. Due to the extent of the financial damages caused by the pandemic, most actors in the agro-industry perceived losses of not more than Rs 500,000 over their total annual sales for 2020 (Figure 14).

7.1.4 Response to COVID-19

To financially survive the pandemic, the participants were asked whether they tried to establish new businesses or find an alternative source of income. A total of 80.8% remained within their businesses. Additionally, every single citizen was compelled to abide to the sanitary measures which included their residence as well as their workplace[27]. This led to a new working procedure even for farmers, producers and processors which were well received by the latter. A vast majority of the respondents followed the instructions properly (Figure 15). Furthermore, due to the nature of some activities 4.8% were compelled to completely close their businesses while 34.6% partially closed to only maintain necessary operations.

[27] Government of Mauritius (2020). Public Health Act. 'Regulations made by the Minister under section 79A of the Public Health Act'. *Government Gazette of Mauritius. Government Notice No. 92*

Figure 14. Losses recorded for total annual sales for 2020 (%).

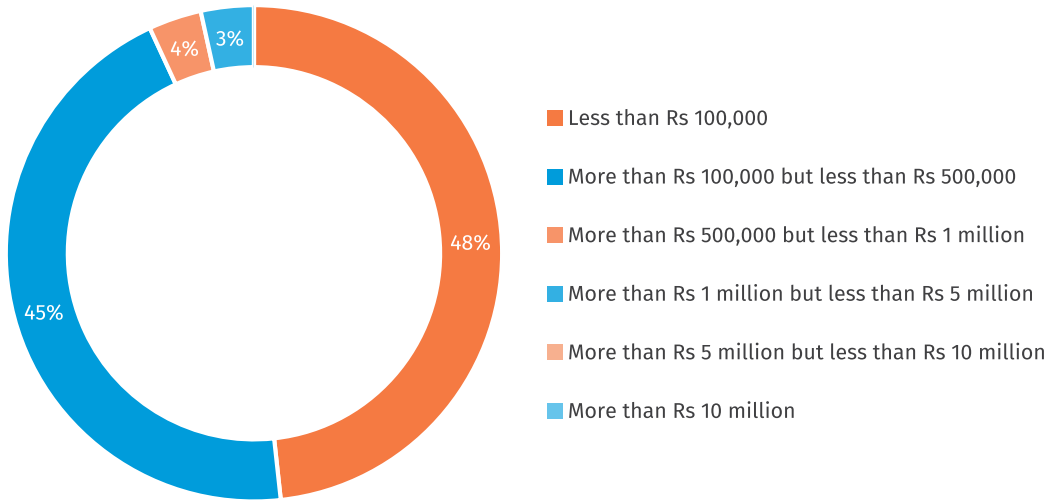
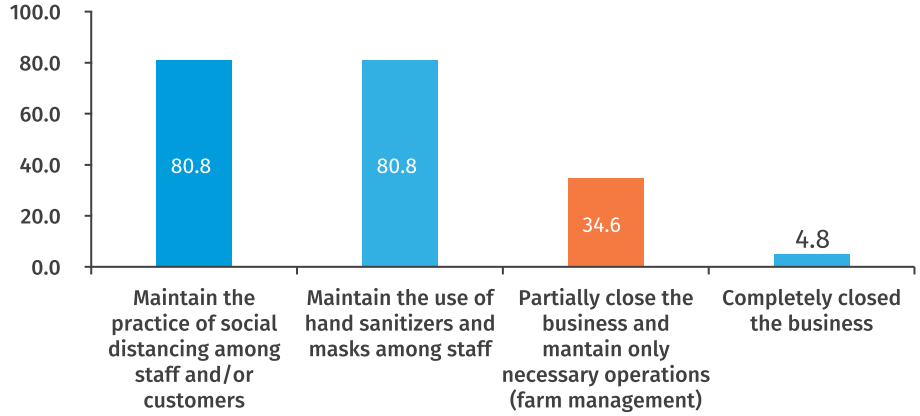


Figure 15. Measures implemented by farmers/producers in response to COVID-19.



Following the lockdowns, sanitary measures and new policies implemented by the government, a sudden decrease in purchasing power was observed[28]. Drastic increases in the price of numerous food commodities were seen but the same case was also seen with respect to non-food commodities. In the agricultural sector, the prices of feed, supplements, fertilizers, seeds, and fuel among others escalated (Figure 16).

[28] UNDP. The Socio-Economic Impact Assessment of COVID-19 in Mauritius.

This also led to a significant decrease in the number of customers who already faced lowered purchasing power.

Nonetheless, the respondents have observed a change in the behaviour of their clients with respect to the sanitary measures (Figure 17). There has also been some concern on the use of online services for requesting products, placing orders and home deliveries.

Figure 16. Perception of changes in business operations and costing.

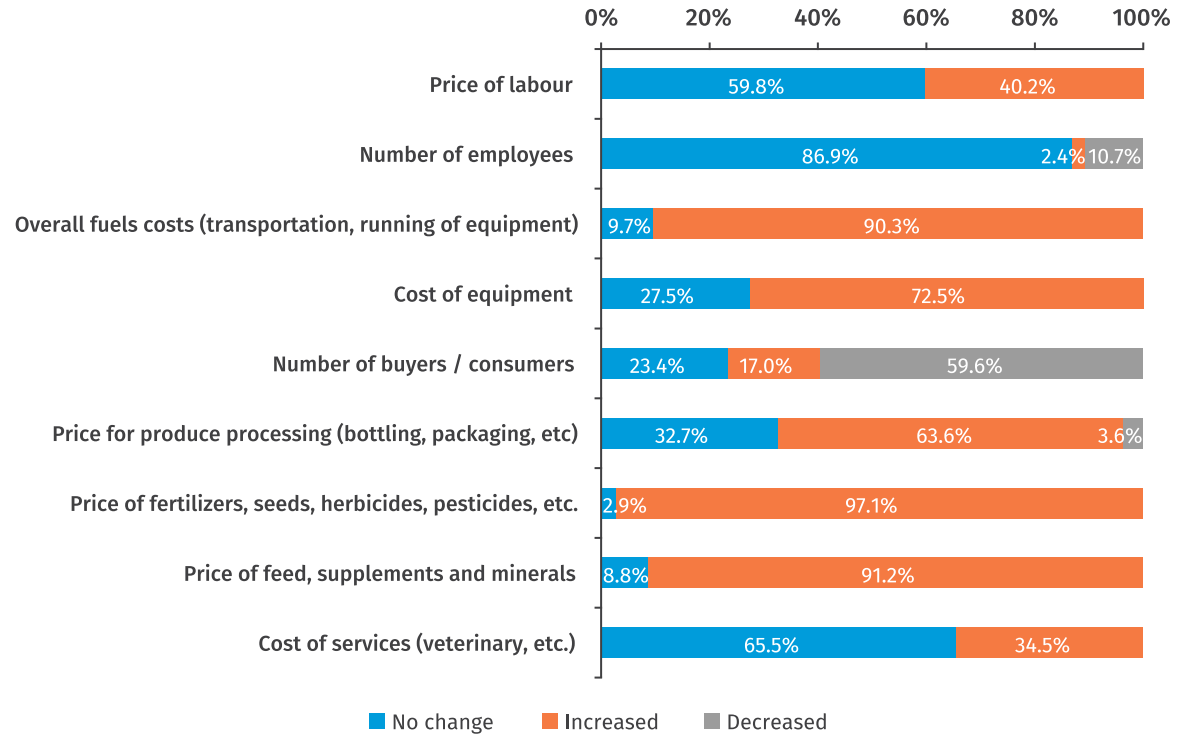
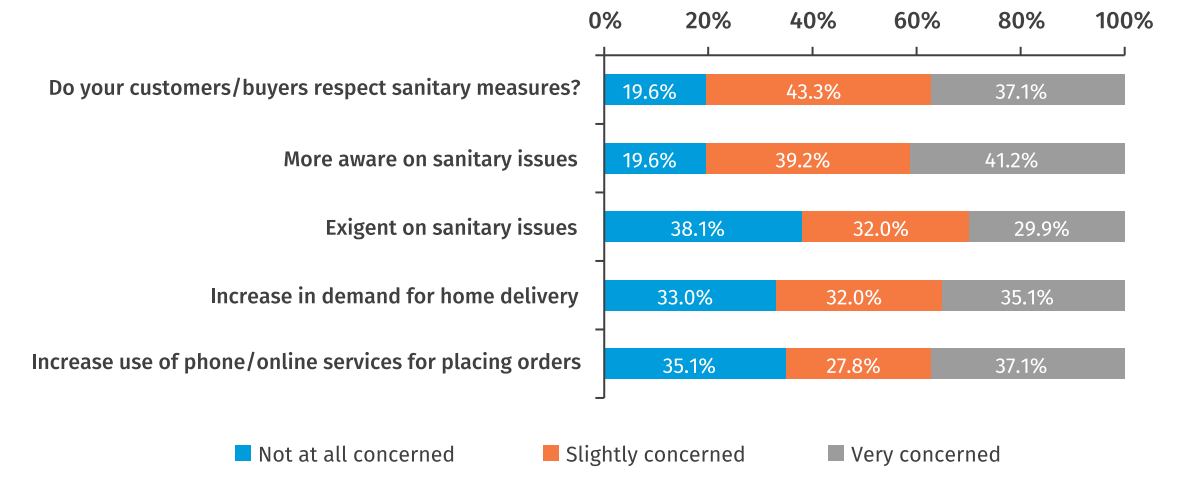


Figure 17. Level of concern to the changes observed in the behaviour of clients after impact of COVID-19.



8.
OUTCOMES OF WORKSHOP

Following the surveys on the review of the SME Act and the impact of COVID-19, the findings were presented to an audience (42 participants) comprising of planters, farmers (livestock and dairy), agro processors, beekeepers, policymakers, and representative from key institutions such as EDB, SME Mauritius, FAREI and the MOAIFS, among others. The workshop also had a technical session where the actors from each sector were grouped together to work on the following topics:

- Define key factors and potential threats in each sector.
- Propose feasible schemes for sustainable production.
- Propose methodologies/policies for producers to manage their farms and sell their products in case of a new pandemic/lockdown or similar level of catastrophe.

The proposals obtained from the participants sector-wise are formulated below.

8.1 CROP PRODUCTION AND AGRO PROCESSORS

The study has focused on the impact of COVID-19 on MSMEs in the agro-processing sector, with a key emphasis on farmers in this chain. The value chain is a concept which simply constitutes the entire range of activities required to bring a product from the initial input-supply stage, through various phases of production, to its final market destination.

Based on detailed field interviews and recommendations emanating from the workshop held on 12th May 2022, the findings below identify gaps and opportunities to reinforce linkages within the value chain of the agro-industry sector that fall under SMEs/MSMEs in Mauritius.

1. Long-term agro-industry vision for farmers and agro processors (~ 20 years)

A long-term vision for the agro-industry is required so that the industry can sustain itself during devastating and unprecedented events. Most of the agricultural land is converted into construction sites so it is high time to preserve productive agricultural land for farming projects and provide incentives for planting. This will boost the production sector to foster sustainable agro-processing activity.

Agro-processing encloses a large number of transformation models and end products and should be focused as the main target for food production. This requires necessary precautions, the grading on crop production is very harsh when it comes to high quality fresh products. These themselves must be properly cleaned, dried and presented in such a manner that they have value and yet are competitive against imported food. Thus, a thorough review of the whole chain from farm level up to the agro-processing will help gain more insights on future steps.

2. Amendments in the Finance Act and SME Act

Farmers and cooperatives have recommended amending the current Finance Act and SME Act to include and put more emphasis on farmers and agro processors.

3. Access to labour, land and finance

The Ministry of Agro-Industry and Food Security and Ministry of Housing and Land Use Planning should work together to come up with a database of available land for agriculture purposes. They can be geolocalised on a dedicated website where advertisement for job vacancies from operators, junior staff to experts could also be included.

A significant proportion of national funds can be used to support agricultural production inputs and develop innovative ways of collecting rainwater in remote areas for irrigation.

4. Organise workshops and training seminars for farmers

The creation of a School of Agriculture would empower youth in farming and valorise the sector to increase youth interest in farming/agro-processing. It is also important to empower farmers and agro processors with the necessary skills for bio-farming, permaculture, agroecology and agro-processing technologies. An exchange of research and knowledge in farming and agro-processing at national, regional, and international levels is also needed.

5. Strengthen and revive the soil

Farmers have highlighted that it is difficult to implement bio-farming for two main reasons:

- Lack of knowledge to find alternatives to the use of synthetic fertilizers and pesticides; and
- Occurrence of extreme climatic conditions which is a source of discouragement.

There is a need for compost making and to develop schemes for the acquisition of shredders for SMEs/MMSEs.

Though farmers in Mauritius have always supported the idea of organic farming, they often find it less profitable. They are caught between the dilemma of earning more at the expense of cleaner agriculture. Constant efforts and support must be provided to accompany them during that transition to a cleaner and circular agricultural system. This support will be crucial towards more organic production.

The other side of this coin is the willingness by consumers to pay for cleaner food. How much is a local consumer willing to spend on organic produce? We observe the price as the primary driver followed by the quality of the produce. We need a thorough study, and an aggressive campaign for the consumption and production of quality food.

6. Food security plan

The demand and supply requirements for agro-processing must be established to create a dynamic and sustainable industry. It will be the basis for food security solutions as claimed by all stakeholder involved in agro-industry including the government, SMEs, and consumers. One of the benefits is the creation of a seed bank for locally resistant fruits and vegetables in Mauritius.

7. Limited logistics and mechanisation

There is a pool of farm vehicles and machinery that is provided to registered planters. Many planters acknowledge that they have benefitted from these for de-rocking as well as preparing their land for plantation, but often experience long waiting times. To some extent, cooperatives are urged to source international funds as well as national funds to acquire such machinery. Thus, increasing the pool of facilities available to planters is necessary. An alternative is to hire equipment from private service providers but at a higher cost.

8. Institutionalise production of vegetables and fruits

Small planters are afraid that there will be a shift in the producer profile to the corporate large-scale vegetable production in the coming years.

They agree that it would help to enhance the quality and availability of the food produced, however, there may be a monopolistic control on sale prices.

9. Agro-Processing Zones

Modernising the agriculture sector and increasing its links with other parts of the economy and value chain have been slow in Mauritius due to a lack of collaborative leadership and know-how.

There is an opportunity to create jobs through manufacturing, services, agro-processing, and other related agribusiness activities.

10. National wholesale market (PPP)

The long-awaited national wholesale market will soon be a reality, as announced in the technical sessions, and will hopefully regulate the price of vegetables. The main benefits of this initiative are the traceability of the source of vegetables and to be able to regulate quality standards on vegetable and fruit growers.

11. Local production of fruits

Locally produced fruits have a great potential to substitute for most of the imported produce because of high local demand. Although there is a high demand for local fruit, supply does not follow because of the following:

- High cost of production in most cases;
- High perishability of the fruits which are not preserved;
- Losses during adverse climatic conditions, and
- The seasonal availability of major tropical fruits like litchis, mangos, and avocados.

Linkages between local farmers/agro processors and supermarkets are of high importance. Post-harvest handling techniques and storage technology must be mastered to increase the shelf life of the produce. Then, there will be a higher potential to substitute most of the imported food requirements by locally sourced fresh produce and food products.

8.1.1 AI- driven agriculture

Sophistication with the integration of the use of artificial intelligence (AI) for more control in agricultural systems can boost profitability through precision input, thus minimising wastage along the production systems.

Real-time distant monitoring can help manage farms and propose corrective measures more accurately, while AI-driven agriculture can enhance the better monitoring of standards.

Precision agriculture can greatly avoid the unnecessary wastage of agro chemicals as well as better manage water and fertilizer input using sensors. AI is also a tool that equates with the philosophy of youngsters and an AI-driven agricultural system will promote more young entrepreneurs and start-ups in this sector.

Start-ups can engage in sophisticated agricultural production, but also provide smart services through cloud computing, equipment and software for new agricultural systems, marketing and selling platforms for agricultural products.

8.2 DAIRY AND LIVESTOCK

1. Establishing a standard for dairy farmers

Dairy farmers possessing less than 10 heads are very common in this sector. The participants proposed to assist for a minimum of 10 milking cows through interest-free loans. The loan will also permit the construction of appropriate sheds.

2. Allocation of land for grazing and crop production

Farmers currently do not possess much/any land to allow their animals to graze, which would contribute to a lot of their feeding: 2 'arpents' of land per milking cow over a period of 10 years can be allocated. This will allow the growth of crops such as maize/sorghum for fodder production and for grazing.

In the case of over production of forages, the latter can be processed and stored as silage for future use or even sold to other farmers.

3. Silage production scheme

Farmers must be assisted with the acquisition of equipment such as chaff cutters and mini silage baggers through schemes.

4. Mechanisation support scheme

The scheme for land preparation of Rs 15,000 per arpent is currently only available to planters. The request is to extend this to dairy and cattle farmers for aquiring appropriate land.

5. Review of veterinary services and medical supplies

Provision of technical trainings to farmers by foreign farmers and expert veterinarians is requested. They can empower the trained farmers to provide an initial treatment, diagnose diseases, and evaluate the severity of the problem before the intervention of the veterinary services. Medical supplies may be subsidized or supplied freely during the visit from the veterinarian.

6. Concessions on vehicles

Provision of concessions on larger vehicles such as 4-wheeler trucks to assist the farmers in gathering and transporting an increased amount of forage per trip.

7. Need to revamp the genetic population and artificial insemination

Artificial insemination services must be restored. Another proposition is to introduce new pure breeds of cows and bulls on the island.

8. Price of feeds

Encourage local production of maize for feed production with a subsidy to substitute the import of raw material. Increase the subsidy on feed for livestock and dairy production.

9. Turning wastes into useful products

Promote the use of manure for bio-farming and encourage the development of solid waste into biogas as a source of revenue.

10. Marketing and processing of milk

Farmers have established the fact that not all of them have the capacity to transform their milk into value-added products. They need more milk and proper equipment such as pasteurizers, etc. The government must assist eligible farmers to shift as agro processors through loan-free interests or schemes to purchase equipment and build processing facilities. The government should also introduce advertisements and raise public awareness to encourage more consumption of local products. Other farmers must also be encouraged to raise their managerial and entrepreneurial level by training and exposure to higher standards.

8.3 APICULTURE

1. Key factors and potential threats

Honey production was heavily affected by the outbreak of the Varroa mite in Mauritius. This incident was most probably caused by the illegal smuggling of honey queens from Madagascar. It took a lot of effort from the government agencies to handle the spread of mites as well as compensate for the loss of hives. Similarly, another bee pest, the small hive beetle, has also caused a reduction in local bee colonies and honey production.

Bees are essential for the agriculture sector as well as for maintaining a green environment. Often not valued enough for their role in pollination, bees are crucial for vegetable and fruit production. Apiculture should not only be compensated through the sale of bee products, but an additional scheme should be provided to maintain beehives as a service to the community for rearing healthy hives.

2. Cultural practices

It is a fact that urbanisation and monoculture have impacted a lot on natural habitats. Bees, as well as other insects, have suffered considerable losses in foraging grounds and are often limited to a few gardens in urban areas. As such, there is a need to demarcate the area for the placement for hives. The proposal of bee zones was highly appreciated and the promotion for the cultivation of melliferous plants was proposed for vegetable growers' green belts as well as in backyard gardens.

3. Use of chemicals: pesticides/ herbicides

The Dangerous Chemical Control Board (DCCB) has proposed restrictions on certain pesticides. However, beekeepers reported that some growers still use agro chemicals that may affect bee health. There was an urge for more control over the types of agro chemicals being used by farmers.

As such, the Varroa mite remains the main concern for beekeepers and there was a proposal to try more treatment methods against this mite. Imports of certain chemicals, and trials of some locally produced plant-based ingredients and cocktails may supress the growth of Varroa. Tagetes and Ocimum were proposed as possible repellents for Varroa mites so a subsidy on the import of electronic devices to control Varroa mites was also proposed.

4. Proposed schemes and incentives

There were reports of regular thefts of beehives and it was proposed that the government may come up with an insurance scheme to cover thefts as well as losses due to weather conditions and colonies leaving the hives.

The price of locally produced honey is higher than imported produce. Honey production in Mauritius is seasonal and there are investments as well as associated risks. Though local producers are producing other derived products, the honey business is still in its infancy.

This sector needs investments in terms of providing dedicated land/green spaces for foraging as well as schemes that can assist in the rearing of at least 20 hives per beekeeper. Schemes can also include the purchase of duty-free 4x4 transportation vehicles for beekeepers. Cooperatives in this sector should be encouraged to initiate projects on the purchase of centralised equipment and support and export local bee products.

Meeting international quality standards are prerequisites to accessing international markets. Proposals to work on a project towards geographic indicators for the local honey production could benefit as a strong marketing tool. Meeting organic standards for honey production and maintaining international honey monitoring plans will prove to be key for reaching out to sell in international markets.

The MOAIFS and FAREI must consolidate training and capacity building towards a robust apiculture sector. Provisions should also be made for managerial and entrepreneurial skills in the training programmes.

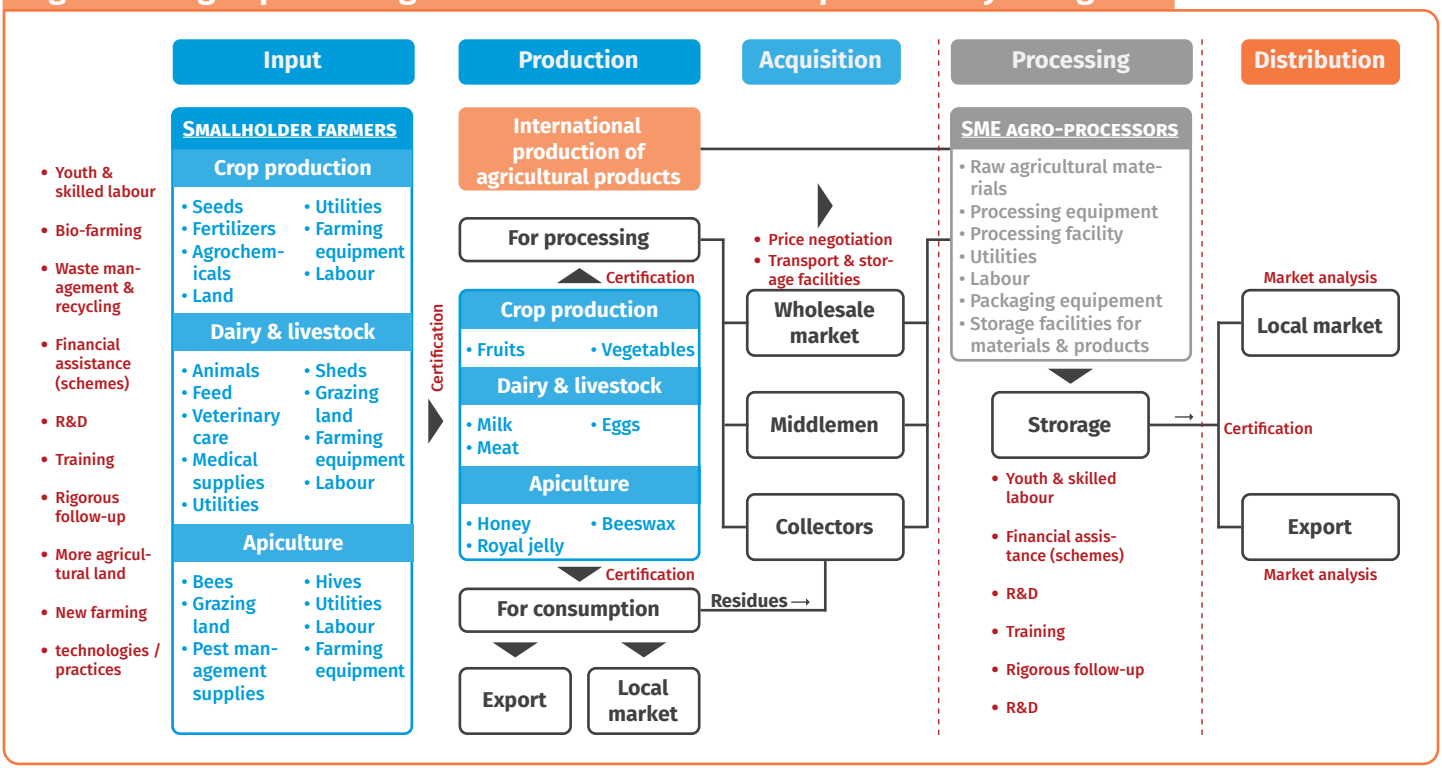
8.4 INTEGRATING THE WORKSHOP FINDINGS IN THE AGRO-PROCESSING CHAIN

The participants voiced out the existence of multiple issues in the agro-industry from crop farmers to beekeepers, which were further validated by the surveys. Then, as per the objective of the workshop, they also brought forth plausible recommendations (previous section) and the need to pay attention to specific areas which were identified as follows:

- Need for younger skilled manpower,
- Bio-farming,
- Waste management and recycling,
- Market analysis and entry,
- Certification facilities,
- Storage and transportation facilities,
- New technologies for improved production and processing,
- Financial assistance,
- Availability of land.

In terms of the agro-processing chain, those areas can be strategically worked to revamp the productivity of producers and agro processors as per Figure 19. To assist such endeavours, actions are required, and recommendations are provided and discussed in the next section.

Figure 18. Agro-processing food chain with areas to implement key changes.



9.

THE WAY FORWARD – BOOSTING THE SMES IN THE AGRO-INDUSTRY SECTOR

A very high percentage of SME producers in the agro-industry were negatively impacted by the pandemic. The situation was worse for agro processors due to the lack of agricultural raw materials to work with. Agro processors have already been identified as medium-value-added in the value chain of high growth potential sectors by the government[29]. The halt in activities in this sector is of significant concern to the national economy. Based on the analysis of the SME framework, SME Act, 10-Year Master Plan for the SME Sector in Mauritius, schemes and policies and the impact of COVID-19, there are key actions required from the authorities to address the problems encountered by SMEs in the agro-industry.

9.1 ACTIONS REQUIRED

9.1.1 Action 1: Re-evaluation of SME framework

The SME Act and the 10-Year Master Plan for the SME Sector in Mauritius currently act as reference materials to help boost the presence of SMEs from economic sectors in becoming more significant contributors to the GDP. Those documents should be reviewed or have derivative documentation, tailored for specific sectors. In this context, there is a need to define the roles of SMEs in agriculture, from farmers (crop growers, dairy farmers, etc.) to agro processors. Producers/processors should be qualified based on a minimum standard and this needs to be defined.

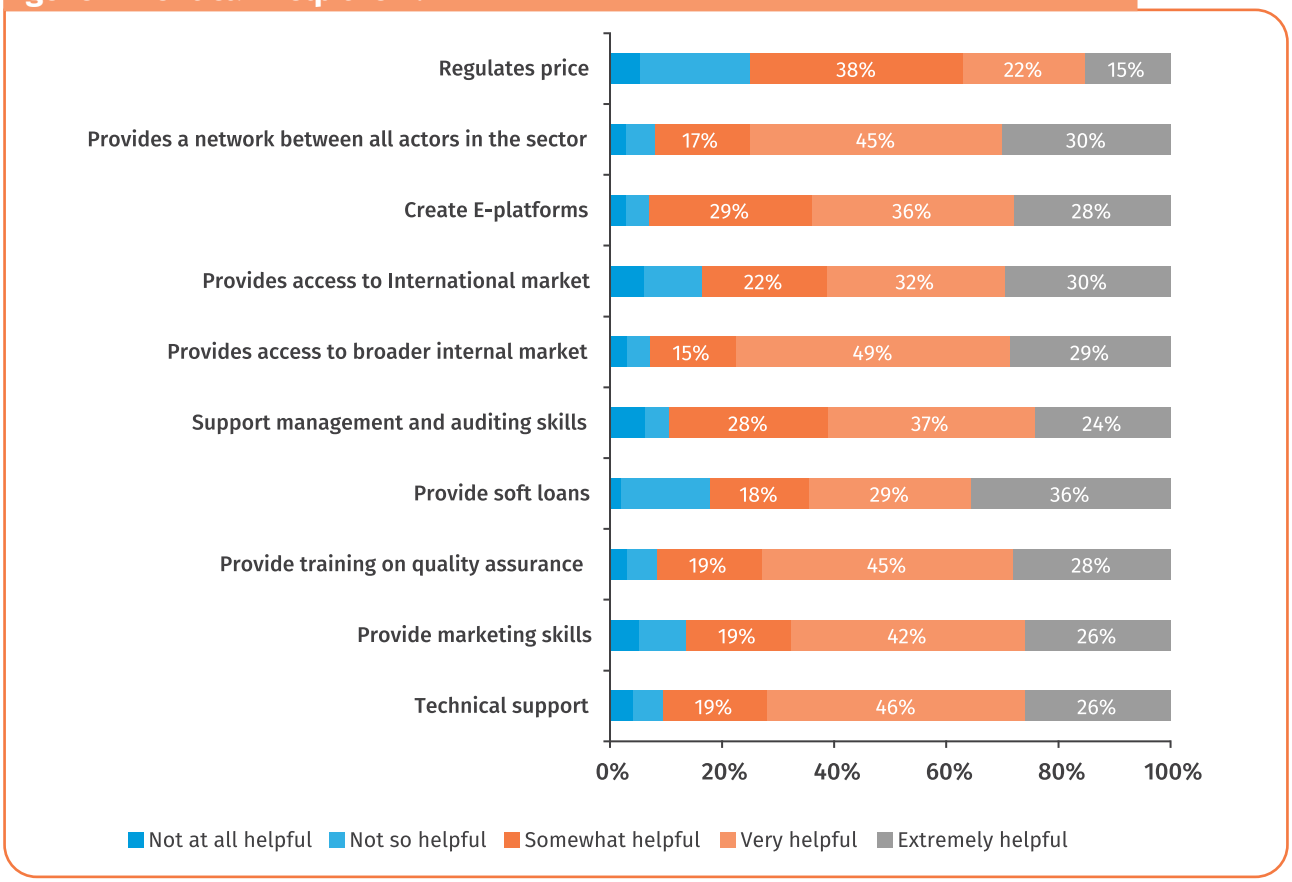
[29] Ministry of Business, Enterprise and Cooperatives: 10-Year Master Plan for the SME Sector in Mauritius.

9.1.2 Action 2: Provision of support

In terms of support, the participants in this project were also requested to judge the usefulness of some suggestions on how the government could help them be more competitive (Figure 19). The most acknowledged suggestions were:

- **Provision of a network between all actors in the sector;**
- **Provision of access to broader internal market;**
- **Provision of training on quality assurance;**
- **Provision of access to international markets;**
- **Provision of soft loans that will help for equipment and logistics.**

Figure 19. Responses from participants to suggestions on how the government can help them.



The establishment of an Emergency Technical Team, centred on agricultural activities and agro processors, to provide solutions and guide the government and associated authorities as well as all actors in the food production chain for SMEs is needed. The participants were also asked how the government could support SMEs in the sector amid a crisis like the current COVID-19 (Figure 20) pandemic. The provision of compensation and financial assistance were the most favoured options.

Increasing the number of beneficiaries of schemes is also important. The use of media (TV/radio and social platforms) and extension officers to dispense information on the new/existing schemes to the producers/processors are the most favoured strategies, while also providing support through explanations when filling in the applications (Figure 21).

9.1.3 Action 3: Population sensitization, education and training

The working population in the agro-industry is ageing and the **youth is not interested in agriculture.** There is a dire need to encourage younger generations to enter the agro-industry. This can be done by:

- **Organising competitions** between secondary schools and between tertiary education bodies to promote agricultural SMEs among youngsters.

Figure 20. Appreciation of support the government could provide in moments of crisis.

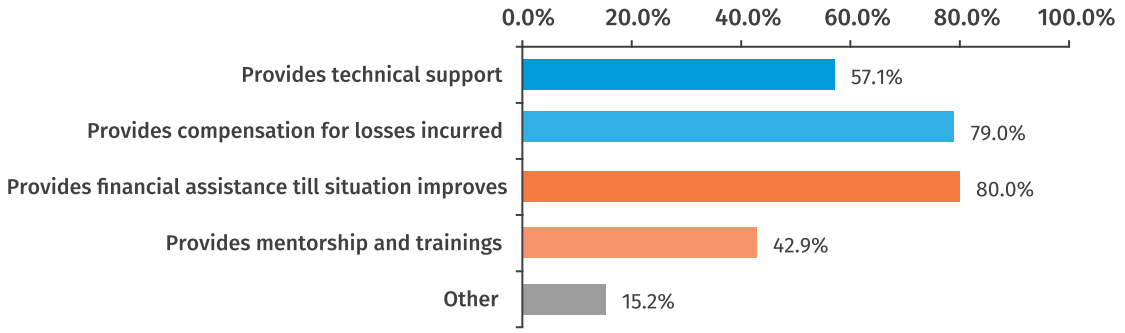
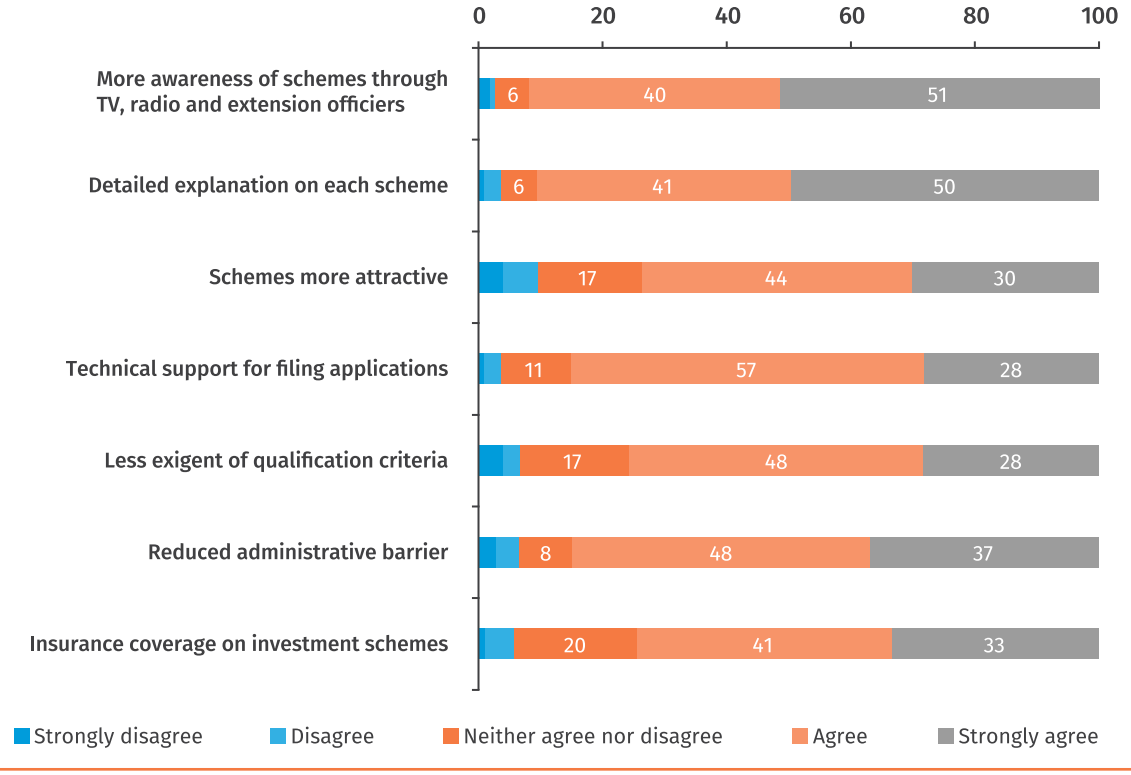


Figure 21. Agreeableness (%) on options that could help improve the adoption of schemes by farmers/producers/processors.



- **Regular interviews of success stories** and young entrepreneurs on national TV and radio, and newspapers to encourage agricultural entrepreneurship among youngsters.
- **Promote agricultural and practical activities** and awareness in education from primary education level.
- **Strengthen the cursus of Home Economics at school with Mauritian circular economy and the use of locally processed food.**
- Initiate **career guidance** activities, from secondary school on, to promote SMEs in agriculture.
- Initiate **community sensitization** on the prospects of the agro-industry to both older and younger generations to change the negative perception of the sector as a source of income.
- **Training of the entrepreneurs** is essential on both management and entrepreneurial skills. As agro-processing involves several actors right from farm production to market, training should be specialised for each player in the agro-value food chain.
- Officers should receive **training from experts** or be trained abroad. Training of trainers on new technologies, norms and regulations, certification and standards.
- Following such training, extension officers should undergo **capacity building** to strengthen their skills and knowledge check.
- Need for more public campaigns from health sectors, government bodies, teaching institutions on the **health benefits of nutritious foods** rather than cheap ultra-processed and nutritionally poor commodities.
- Democratising diverse menus from locally processed foods by **local chefs**.
- Training programmes already exist but should be organised more frequently by **reaching out to the public** instead of waiting for applicants.
- There are **numerous agricultural societies, associations, and groups** (FALCON Association, Regeneration Mauritius, etc.). They should be supported to continue promoting agricultural activities and be allowed to collaborate in governmental projects that aim for such activities.
- Joint collaborative efforts between **FAREI, SME Mauritius, NPCC, MRIC, EDB,** and other **institutions** will yield better resources in terms of research, training, and capacity building.

9.1.4 Action 4: Linking actors across the production chain

Actors in the production to processing chain start with farmers, then move to middlemen/ wholesale markets and finally tend with the agro processor and linkages between these actors must be improved. There is a need to:

- **Establish a national digital platform** where data on agricultural materials are available to all actors (type of material, price, availability, etc).
- **Regulate prices** to allow farmers to acquire a better margin of profit when negotiating with middlemen. Farmers and agro processors should ideally be dealing with each other directly through contract farming as the B2B model would ensure a constant supply of quality food.
- **Establish production zones** across the country and regulate the circulation of the materials and processed products within the zones. This can assist in decreasing the carbon footprint.

9.1.5 Action 5: Implementation of regulations and certification

Regulations and certification are vital for food safety at the local and international levels. In the Mauritian context, the MauriGAP certification is needed at the level of farm producers and the HACCP certification is needed for the export of processed products. As per the survey, only a very small percentage of the actors respect those norms. This can be achieved by:

- Highlighting the **significance of the certifications and respect of regulations** for food safety and food handling for successful business operations need to be taught to farm producers and agro processors.
- Training the actors on the importance of **written contracts** for proper follow up of the materials and products. As seen in the survey, almost all SMEs work on verbal agreements.
- Extending regulations to new agricultural systems of production like organic farming, smart agriculture, sheltered production, permaculture, among others.
- Enforcing of laws should be enacted to distinguish an effective value and market for the certified products.

9.1.6 Action 6: Improving the marketability of products

In order to improve the marketability of products the following actions are needed by the relevant authorities:

- **Explore the regional and international markets** and identify key areas for potential marketing.
- At the local level, help agro processors **gain more visibility** by:
  - Having **more shelf space** in markets and supermarkets;
  - **Advertising campaigns** (TV, radio, social media, newspaper, etc) to promote the products;
  - **Train** agro processors on how to market their products using ICT and social media.
- Help establish connections to high-end consumers such as the **tourism industry** (hotels, restaurants, and lodges).
- Establish connections between agro processors and qualified graphic design operators to create appealing product designs, logos, and overall look. Labels with the nutritional value of food products can greatly enhance marketability.
- There is a need to acquire data on the rate of sales of locally produced processed items in supermarkets and other outlets. This will give useful insights on the market demand.

9.1.7 Action 7: Implementation of organic farming

Bio-farming/organic farming is a much-desired farming system due to its benefits to human health, the environment and the surrounding ecology. For crop producers, there are already ongoing training programmes and large-scale projects such as Smart Climate Change Agriculture. However, for other sectors such as apiculture, dairy and livestock, not much is available. Those participants were questioned about their perceptions of certain aspects of bio-farming (Figure 22). Beekeepers were very interested in the concept of bio-farming, but the dairy and livestock sector had an intriguing perception of neutrality towards specific practices.

There is a need to educate dairy and livestock farmers on the good practices of bio-farming and how it can boost their business operations as well as the advantages of chemical-free milk and meat production and the potential for improved products.

9.1.8 Action 8: Areas of R&D for improved productivity and value-added

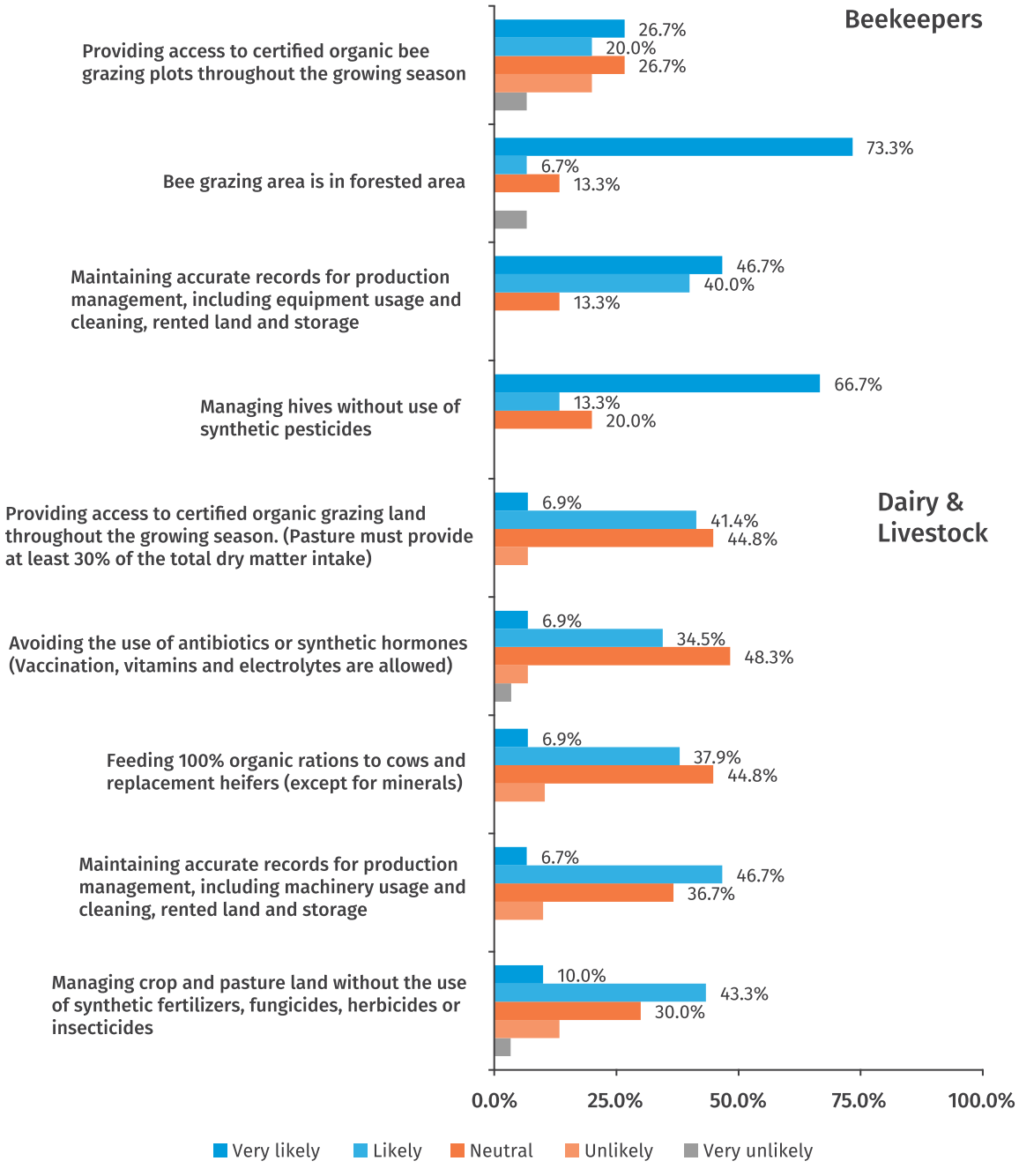
Research and development play a vital role as facilitators in increasing productivity both at the level of farmers and at the level of agro processors. Some areas of interest would be:

- **Agricultural biotechnology:**
  - **Protoplast fusion vs. conventional breeding techniques.** Protoplast fusion within the same species allows the exchange of genetic material under controlled conditions and from organisms of similar type, yielding new variants without being referred to as GMOs. This can lead to the development of new varieties of crops with desired traits (Wang et al., 2013).
  - **Microbial biotechnology: Bio-fertilizer with microalgae.** Microalgae are microscopic organisms that can carry out photosynthesis by using sunlight and absorbing carbon dioxide from the environment to produce proteins, carbohydrates, lipids, and value-added compounds such as vitamins. Microalgae cultures do not compete with food crop production and are considered as a carbon neutral process. They can also serve as agents of remediation (phytoremediation) of wastewater and hydroponic effluents. The removal of nitrogenous and phosphorus compounds from wastewater can be a potential source of nutrients for microalgal culture. Post cultivation, the biomass produced can be utilised in numerous sectors, including feed production and as bio-fertilizers. **The culture of microalgae holds a lot of potential due to its carbon neutrality, that there is no competition for land and crop production, and because it helps in carbon sequestration and results in a biomass of agricultural significance.**
- **Food waste and recycling:**
  - Mauritius generates about 1,488 tonnes of waste daily. Of these, the value of organic waste reaches up to 60%. This should be considered as a raw material to produce compost. Around 17% of farmers use organic fertilizers, compared to 56% who use mineral-based ones. Successful entrepreneurs such as Island Bio and Sea Life Organics have seen opportunities in transforming organic waste and algae into 100% organic composts.

- **Educating the population about organic waste and recyclable waste and the importance of doing so.** The Household Compost Scheme implemented in 2012 to 2014 was quite successful but has lost its impact. Educating the population and reviving this scheme could be beneficial to this cause.
- **Introduce the concept of waste management and sorting at home.** E.g., wastes could be separated based on their type into coloured bins that would be picked up on specific days.
- **Establish organic-only landfill zones across the country:** This will help in providing organic compost to all areas without impacting the carbon footprint.

Agro processors need to be oriented towards **new product development** and trained in the use of **new technologies**. Alternatively, research institutions may embark into product development and acquiring rights to ensure that the knowledge is not leaked, and then disseminate the latter to agro processors.

Figure 22. Likelihood to accept bio-farming practices in the apiculture, livestock and dairy sectors.



9.2 RATIONALE OF KEY ACTIONS

The key actions listed in the previous section are required for the goal of boosting the number of SMEs in the agro-processing industry and the productivity of existing ones. As seen in Section 3.4, the food processing chain starts with the producers and ends with the distribution of the products on the market. A simplified way to express how this can be achieved is as follows:

"Implementing key actions at the Input section will cause an increase in the Production section and a decrease in the import of raw agricultural materials. Increased production, coupled with key actions, entering the Processing unit will increase the productivity and number of SME agro processors."

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11. Annex

APPENDIX 1

Questionnaire: Review of SME Act, Policies and Schemes

(Some questions are sector specific and some are exemplified by only one sector to avoid repetition)

Section A: Background Information

1. Family name.....

2. Name .....

3. Age ..... **4.** Gender ○ Male ○ Female

5. Residential address: **6.** Business address:

....

....

....

7. Business name.....

8. Ownership: ○ Self ○ Cooperative ○ Association ○ Company ○ Other: .....

9. Other occupation (If any): .....

10. Respondent's educational background: .....

○ Primary school ○ University

○ Secondary school ○ Vocational school

○ Other / Please specify: .....

11. Phone No: **12.** Mobile No: **13.** Fax No: **14.** Email:

....

Section B: Business information

1. For how many years have you been operating your business? Please specify.

2. **Livestock/Dairy**: What are the breeds of cattle you own? Please tick as appropriate.

Breeds	Tick
Friesian	○
Creole	○
Zebus	○
Ongole	○
Mysore	○
Hissar	○
Cross (Creole and Friesians)	○
Others	○

3. **Apiculture**: What are the bee species you own? Please tick as appropriate.

Breeds	Tick
African Bee (*Apis melifera*)	○
Italian Bee (*A. linguistica*)	○
Hybrid of African and Italian Bee	○
Others	○

Others (Please specify): .....

.....

4. **Apiculture**: What are products you obtain and services you provide from your beekeeping business? Please tick as appropriate.

	Tick
Honey	○
Honey comb	○
Bee wax	○
Propolis	○
Bee Pollen	○
Royal jelly	○
Bee venom	○
Pollination services	○
Others	○

5. Where do you store your products?

   Choices: Storeroom / Refrigerator / Cold-room / Others

6. From where do you get the raw /starting agricultural material? Tick as appropriate.

   Choices: Personal Production farm / Purchase from local producers / Purchase from local suppliers / Import Directly / Others

7. What value do you add to the product before distribution?

   Choices: Processing / Quality improvement / Bundling and packaging (provide expert advice)/ Place utility / Create anticipation (emotional connection for customers) / Risk reduction (making it safer) / Other

8. What is your competitive advantage?

9. Who are your customers?

   Choices: Supermarket / Retail shops / End consumers / Export / Other

10. Are there any specific regulations/standards that you need to comply with in order to participate in the value chain with respect to your sector? E.g., ISO, HACCP, etc.

    a) Yes/No

    b) If "Yes", can you name them?

    c) If "Yes", who ensures compliance to these standards/rules/regulations?

    d) Choices: Government bodies / Extension officers / Contractor or customer

Financial aspect of business

11. How are prices set in the sector?

Choices: Bidding / Price negotiation / Settle price / Other

12. How do you establish your market price?

Choices: Other vendors price (competition) / Buyers' demand/negotiation / Location or transportation cost / Time of the year / Availability of raw or starting material / Other

13. Is there any fluctuation in the price or is it fixed?

Choices: Price fluctuate / Fixed price

If price fluctuates, when does this occur?

.....

14. Is there any seasonality in the availability of the raw materials?

Choices: Yes / No

15. What are the payment terms when selling your products?

Choices: Long delay in paying agents / Payment on receipt of finished goods

16. How would you define the profitability of selling through the different points of sale listed below?

	Not applicable	Less profitable	More profitable
Consumers directly			
Wholesale			
Retailers			
Other / Please specify:			

Client/Customer relationship

17. Is there any preference in choosing your suppliers?

Choices: Trust / Quantity Assurance / Price of Product / Payment facility / Quality assurance / Other

18. Is the coordination based on formalized arrangement (contract) or an oral arrangement?

Choices: Formalized / Oral

19. What is the level of formality that exists in your communications with your clients?

Choices: Verbal agreement / Written contract / Legal document

20. What is the level of trust?

Choices: No trust / Little trust / Some trust / Full trust

21. What is the trend in the industry/sector in the current COVID-19 era?

.....

22. What types of external services are you benefitting from?

Government body	Services obtained
Private organization	

SME Act related queries

23. Are you aware about the SME Act?

Choices: Yes / No

24. Are you aware of any policies and schemes proposed by the government to help SMEs in the sector?

Choices: Yes / No

25. In the past have you benefitted from any such schemes?

Choices: Yes / No

If "Yes", what was the scheme and how did it help you?

.....

26. Do you get enough support from the government to boost or support your business?

Choices: Yes / No

If "Yes", what type of support did you benefit from?

.....

If not, what type of support do you think the government should offer to support your enterprise?

.....

27. Do you plan to expand or diversify your business?

Choices: Yes / No

28. Do you export your products?

Choices: Yes / No

If "Yes", which countries do you export to?

.....

If "No", do you intend to export your products in the future?

Choices: Yes / No

29. How do you think the government, through its schemes, can help you to become more competitive?

	Not at all helpful	Not so helpful	Somewhat helpful	Very helpful	Extremely helpful
Technical support	○	○	○	○	○
Provide marketing skills	○	○	○	○	○
Provide training on quality assurance	○	○	○	○	○
Provide soft loans	○	○	○	○	○
Support management and auditing skills	○	○	○	○	○
Provides access to broader internal market	○	○	○	○	○
Provides access to international markets	○	○	○	○	○
Create E-platforms	○	○	○	○	○
Provides a network between all actors in the sector	○	○	○	○	○
Regulates price	○	○	○	○	○

Other/Please specify .....

30. In difficult times (unexpected situations), have the government policies or proposed schemes helped you?

Choices: Yes / No

If "Yes", how?

.....

31. How can the government support SMEs in the sector in times of crisis like COVID-19 ?

○ Provide technical support

○ Provide compensation for losses incurred

○ Provide financial assistance till situation improves

○ Provide mentorship and trainings

○ Other/Please specify:

.....

32. In case of catastrophes that affect your production, do you know who to contact or are you contacted by authorities?

a) Choices: Yes / No

b) If "Yes", who would they be?

.....

c) Is their advice helpful? Choices: Yes / No

Land use for agricultural practices

33. Livestock/Dairy: How did you get the land on which your animals dwell/ graze?

	Land Ownership	Tick Where Appropriate
1.	Inherited family plots	○
2.	Purchased land	○
3.	Leased from government	○
4.	Rented land from others	○
5.	Cooperative	○
6.	Schemes	○

Other/Please specify:

.....

34. Do you have any land that is currently un-utilised?

Choices: Yes / No

If "Yes", what challenges listed below prevent you from making use of the land?

	Reasons for Not Utilising the Land	Tick Where Appropriate
1.	Land arid/marginal	○
2.	Water shortage	○
3.	Labour shortage	○
4.	Financial constraint	○
5.	Accessibility	○
6.	Theft	○
7.	Other/Please specify:	

35. What are the measures/support that the government can provide, that can enable you to utilise the unused land and how helpful do you think they would be?

	Not at all helpful	Not at all helpful	Not so helpful	Somewhat helpful	Very helpful	Extremely helpful
1.	De-rocking through mechanical support	○	○	○	○	○
2.	Enhanced water supply	○	○	○	○	○
3.	Scheme to purchase fence	○	○	○	○	○
4.	Soft loans / Financial support	○	○	○	○	○
5.	Improving access / Asphalting of roads	○	○	○	○	○
6.	Other/Please specify:	○	○	○	○	○

Bio-farming

36. Do you think the government is doing enough to promote consumption of local food products?

Choices: Yes / No

If "No", please specify: .....

37. Bio-farming

a) Have you heard of bio-farming? Choices: Yes / No

b) Do you acquire agricultural raw materials of bio-farming origin? Choices: Yes / No

c) If "Yes", do they significantly contribute to your business operations and income?

Choices: Yes / No

d) If "No", would you be interested to sell products that are manufactured from materials of bio-farming origin? Choices: Yes / No

Please specify why: .....

e) **Livestock/Dairy**: The following statements are related to the presence of bio-farming in dairy productions. Rate the likelihood of adoption of each statement

	Very unlikely	Unlikely	Neutral	Likely	Very likely
Managing crop and pasture land without the use of synthetic fertilizers, fungicides, herbicides or insecticides	○	○	○	○	○
Maintaining accurate records for production management, including machinery usage and cleaning, rented land and storage	○	○	○	○	○
Feeding 100% organic rations to cows and replacement heifers (except for minerals)	○	○	○	○	○
Avoiding the use of antibiotics or synthetic hormones (vaccination, vitamins and electrolytes are allowed).	○	○	○	○	○
Providing access to certified organic grazing land throughout the growing season. Pasture must provide at least 30% of the total dry matter intake	○	○	○	○	○

f) **Apiculture**: The following statements are related to the presence of bio-farming in Bee-keeping. Rate the likelihood of adoption of each statement

	Very unlikely	Unlikely	Possible	Likely	Very likely
Managing hives without use of synthetic pesticides	○	○	○	○	○
Maintaining accurate records for production management, including equipment usage and cleaning, rented land and storage	○	○	○	○	○
Bee grazing area is in forested area	○	○	○	○	○
Providing access to certified organic bee grazing plots throughout the growing season.	○	○	○	○	○

38. Have you seen an interest for agricultural practices in younger generations?

Choices: Yes / No

If "No", can you specify why that would be the case? .....

Technology as a utility

39. Are you at ease with the idea of using mobile phones as a means for improving your productions and sales?

Choices: Yes / No

40. Are you aware of mobile applications that can help with your business management, etc?

Choices: Yes / No

41. Do you think such applications would be beneficial for you?

Choices: Yes / No

42. Please kindly specify any features in a mobile application you think will help you improve your business?

.....

Section C: Awareness and Adoption of SCHEMES

Government Schemes

43. Do you know about the following schemes?

	Not at all helpful	Tick if YES	Have you benefitted from any of these schemes? YES/NO
1.	Internal Capacity Development Scheme		
2.	Technology and Innovation Scheme		
3.	SME Marketing Support Scheme		
4.	Inclusiveness and Integration Scheme		
5.	SME Utility Connection Assistance Scheme		
6.	Compost Subsidy Scheme – SFWF		
7.	Family Farming Micro-Project Scheme (Livestock) – FAREI		
8.	Family Farming Micro-Project Scheme (Crop) – FAREI		
9.	Other / Please specify:		

44. If you have benefitted from any of the schemes listed above, have they been useful to your business?

Choices: Yes / No

If "Yes", please specify in what way: .....

If "No", please specify how you believe the scheme provider could improve on the latter:

.....

Development Bank of Mauritius Schemes/Facilities/ Soft Loans (DBM)

45. Are you aware of schemes / loans with interests given by DBM?

Choices: Yes / No

46. If you have benefitted from any of the schemes listed above, have they been useful to your business?

Choices: Yes / No

If "Yes", please specify in what way:

.....

If "No", please specify how you believe the scheme provider could improve on the latter:

.....

Small Farmers Welfare Fund (SFWF)

47. Are you aware of schemes / loans with interests given by SFWF?

Choices: Yes / No

	Do you know about the following schemes?	Tick if YES	Have you benefitted from any of these schemes? YES/NO
1.	Heifer Productivity Incentive Scheme		
2.	Upgrading of livestock farm		
3.	Pasture development		
4.	Other / Please specify:		

48. If you have benefitted from any of the schemes listed above, have they been useful to your business?

Choices: Yes / No

If "Yes", please specify in what way:

.....

If "No", please specify how you believe the scheme provider could improve on the latter:

.....

Section D: Constraints to applying for adopting schemes

49. Tick as appropriate for the reasons that discourage you from benefitting from any of the schemes proposed

	Reasons	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	Lack of knowledge	○	○	○	○	○
2.	Schemes not attractive	○	○	○	○	○
3.	Time constraint	○	○	○	○	○
4.	Additional burden	○	○	○	○	○
5.	Too much paperwork	○	○	○	○	○
6.	Qualification criteria too high	○	○	○	○	○
7.	Not interested in any schemes	○	○	○	○	○
8.	Risky	○	○	○	○	○
9.	No support for submitting applications	○	○	○	○	○
10.	Written English barrier	○	○	○	○	○

50. What measures do you think would enable you to adopt available schemes?

	Reasons	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	More awareness of schemes through TV, radio and extension officers	○	○	○	○	○
2.	Detailed explanation on each scheme	○	○	○	○	○
3.	Schemes more attractive	○	○	○	○	○
4.	Technical support for filing applications	○	○	○	○	○
5.	Less exigent qualification criteria	○	○	○	○	○
6.	Reduced administrative barrier	○	○	○	○	○
7.	Insurance coverage on investment schemes	○	○	○	○	○
8.	Other / Please specify	○	○	○	○	○

APPENDIX 2

Questionnaire: Impact of COVID-19 on SMEs in the Agro-Industry

(Some questions are sector-specific and some are exemplified by only one sector to avoid repetition)

1. How would you define the ownership of your business?

Choices: Self / Cooperative / Association / Company

2. How many employees do you have in your business? Please specify.....

3. Are some of your employees also members of your family?

Choices: Yes / No

4. Within what range is your annual turnover?

Choices:

○ Less than Rs 500,000

○ More than Rs 500,000 but less than Rs 1 million

○ More than Rs 1 million but less than Rs 5 million

○ More than Rs 5 million but less than Rs 10 million

○ More than Rs 10 million

5. Are you a full-time dairy farmer/livestock farmer/planter/agro processor/beekeeper?

a) Choices: Yes /No

b) If "No", what other employment do you have?

Choices: Full-time employment / Part-time employment / Other .....
.....

6. Are your farms located close to your residence?

Choices: Yes / No

7. What means of transport do you usually use to go on site?

Choices:

○ By foot

○ By car/bicycle/motorcycle/truck, etc.

○ By public transport

8. Planters: What crops/vegetables do you grow? Please tick as appropriate.

Crops Grown	Tick
Crops Grown	○
Tomato	○
Carrot	○
Eggplants	○
Potato	○
Onion	○
Chilli	○
Herbs and condiments	○
Sugarcane	○
Pumpkin	○
Cabbage	○
Anguive	○
Cucumber	○
Garlic	○
Ginger	○
Peanuts	○
Tea	○

Others / Please specify:

.....

9. Livestock: What kind of livestock do you rear? Please tick as appropriate

○ Poultry

○ Beef

○ Pig

○ Sheep

○ Other/ Please specify: .....

10. Dairy: How many dairy cows do you own?

○ Less than 10

○ 10 to19

○ 20 to 29....

○ 100 to 199

○ More than 200, Please specify: .....

11. Dairy: To whom do you usually sell the milk and how would you describe the level of sales at that selling point?

Point of sale	No sales	Low sales	Moderate sales	High sales
On farm / Directly to consumers	○	○	○	○
Door to door delivery	○	○	○	○
To processing companies	○	○	○	○
Other/ Please specify:	○	○	○	○

Production status during COVID-19 crisis in 2020

12. Dairy: Did the incidence of the pandemic

a) Impact your milk production?

Choices: Yes / No

b) How would you rate this impact on your production level?

○ No impact on production

○ Negative impact on production

○ Positive impact on production

c) From the list on the table below, tick the factors that impacted your production level

Point of sale	No sales	Low sales	Moderate sales
Access to farms (despite curfew)	○	○	○
Access to fodder to be used as feed	○	○	○
Irregular feeding of cows	○	○	○
Irregular milking of cows	○	○	○
Regular cleaning of farm premises and cows	○	○	○
Regular cleaning of milking equipment	○	○	○
Regular veterinary check ups	○	○	○
Number of employees on farms	○	○	○
Other/ Please specify:	○	○	○

13. Did you encounter any loss of animals during the pandemic?

a) Choices: Yes / No

b) If "Yes", please specify the number of animals lost. Please specify:

.....

14. When the government initiated the "COVID-19 Work Access Permit", did you and your employees send in applications?

a) Choices: Yes / No

b) If "Yes", were you and your employees granted the "Work Access Permit"?

Choices: Yes / No

c) If you applied and got a rejection, please indicate reason for the rejection.

Please specify:

.....

15. During the COVID-19 incidence, how impactful were the following influential factors on your business operations?

	Not impactful	Slightly impactful	Significantly impactful
Forced disposal of milk produced	○	○	○
Lack of sales points/markets/customers	○	○	○
Access to working capital	○	○	○
Lack of manpower on farms	○	○	○
Availability of farm inputs	○	○	○
Transportation issues	○	○	○
Closure of food processing facilities / companies	○	○	○

16. Was your stock of feed sufficient during the lockdown?

a) Choices: Yes / No

b) If "No", how did you replenish feed supplies?

- ○ From usual feed supplier
- ○ Purchased from other farmers
- ○ Compelled to use homemade feed
- ○ Could not acquire feed at all
- ○ Other / Please specify:

.....

c) On acquiring new feed supplies, was the price .....

- ○ the same,
- ○ decreased or
- ○ increased

d) Was the sale of feed organised differently than the usual way?

- ○ No change in sale pattern
- ○ Sales were fixed to a specific amount per farmer
- ○ Sales were fixed to a specific amount per gross animal count
- ○ Other / Please specify: .....

.....

17. Did you encounter an increase in mortality rate of your animals?

a) Choices: Yes / No

b) If "Yes", to what reason would you attribute the increase in mortality rate of the animals?

- ○ Lack of feed
- ○ Lack of medical attention (veterinary services)
- ○ Lack of manpower on farms to care for animals
- ○ Lack of medical supplies
- ○ Other / Please specify:

Sales status during COVID-19 crisis in 2020

18. Once the sanitary curfew restrictions were reduced and you were able to sell the harvested product:

a) How did you establish the market price?

- ○ Price was same as before
- ○ Price was decreased
- ○ Price was increased

b) What factors did you consider when establishing the market price? Please tick as appropriate:

- ○ Other vendors price (competition)
- ○ Buyers' demand/negotiation
- ○ Location/transportation costs
- ○ Amount of milk produced
- ○ Other / Please specify: .....

19. In terms of sales:

a) **Dairy:** How would you define the amount of milk you sold during the COVID-19 pandemic?

- ○ Same level of sales
- ○ Decrease in sales
- ○ Increase in sales

b) What level of sales did you record from these points of sale?

Point of sale	No sales	Low sales	Moderate sales	High sales
On farm / Directly to consumers	○	○	○	○
Door to door delivery	○	○	○	○
To processing companies	○	○	○	○
Other/ Please specify:	○	○	○	○

20. Have you observed losses in revenue as a result of COVID-19?

a) Choices: Yes / No

b) If "Yes", what range of loss (on a weekly basis) did you experience?

- ○ Less than Rs 5000
- ○ More than Rs 5000 but less than Rs 10,000
- ○ More than Rs 10,000 but less than Rs 15,000
- ○ More than Rs 15,000

c) What did you record as losses for your total annual sales for the year 2020?

- ○ Less than Rs 100,000
- ○ More than Rs 100,000 but less than Rs 500,000
- ○ More than Rs 500,000 but less than Rs 1 million
- ○ More than Rs 500,000 but less than Rs 1 million
- ○ More than Rs 1 million but less than Rs 5 million
- ○ More than Rs 5 million but less than Rs 10 million
- ○ More than Rs 10 million

21. Did you try to seek financial aid from the government or concerned authorities?

a) Choices: Yes / No

b) If "Yes", who did you contact?

○ Development Bank of Mauritius (DBM)

○ Mauritius Research and Innovation Council (MRIC)

○ SME Mauritius

○ Other / Please specify: .....

22. Did you try to establish a different business or find an alternative source of income following the impact of COVID-19 on your business?

a) Choices: Yes / No

b) If "Yes", in what economic sector did you redirect yourself?

○ Fast food outlet (homemade food/snacks, etc)

○ Transport (food delivery, taxi, etc)

○ Online service provider

○ Others, Please specify: .....

23. With respect to your business operations, what measures did you take or consider implementing in response to COVID-19? Please tick as appropriate.

○ Maintain the practice of social distancing among staff and/or customers

○ Maintain the use of hand sanitizers and masks among staff

○ Partially close the business and maintain only necessary operations (farm management)

○ Completely closed the business

○ Other / Please specify: .....

24. Based on the following statements, indicate your level of concern.

	Not at all concerned	Slightly concerned	Very concerned
Contracting the COVID-19 virus	○	○	○
COVID-19 impact on business financial status	○	○	○
The possibility of a forced reduction of manpower	○	○	○
Transportation fuel prices may be increased	○	○	○
Importation of goods related to your business will be priced higher	○	○	○

25. Dairy: Post the peak of the COVID-19 crisis, how did you perceive the changes in your business operations and costing?

	No change	Increased	Decreased
Price of feed, supplements and minerals	○	○	○
Price of labour	○	○	○
Number of employees	○	○	○
Overall fuels costs (transportation, running of equipment)	○	○	○
Cost of equipment	○	○	○
Price for milk processing (bottling)	○	○	○
Number of buyers/consumers	○	○	○
Cost of services (veterinary, etc.)	○	○	○
Other / Please specify:	○	○	○

26. What kind of changes did you observe with respect to the behaviour of consumers / buyers after the impact of COVID-19?

	Not at all concerned	Slightly concerned	Very concerned
Do your customers/buyers respect sanitary measures?	○	○	○
More aware on sanitary issues	○	○	○
Exigent on sanitary issues	○	○	○
Increase in demand for home delivery	○	○	○
Increase use of phone/online services for placing orders	○	○	○
Other / Please specify:	○	○	○

APPENDIX 3

Budget 2020-2021[30]:

1. **Food security plan**: Inception of a National Agri-Food Development Programme with the promotion of the Farm to Fork concept to ensure food security and reduce dependence on imports. Small planters will be allowed to participate in the programme.

2. **Land use**: Set up of Land Bank of State and Private Agricultural Land under Landscope Mauritius Ltd to manage demand and supply for land that can be used for food production. Planters with up to 10 acres of agricultural land will be allowed to convert up to 10 percent of this land for residential or commercial purposes; There is 20,000 acres of land considered as abandoned to be put on the platform. The acquisition of private agricultural land to be done with the support of the State Investment Corporation (SIC).

3. **Food production**: Processing and commercialisation of super foods to be controlled by FAREI through necessary standards and norms. The Agricultural Marketing Board (AMB) will:

   a) "Prepare and implement a production plan for strategic food crops based on local demand;

   b) Manage the National Wholesale Market for fruits and vegetables before end of 2020;

   c) Establish a price guarantee mechanism for producers to earn a sustainable flow of income;

   d) Invest in regional storage facilities to improve on-shelf life for seasonal crops such as tomatoes;

   e) Engage with local firms for agro-processing; and

   f) Ensure the availability of quality seeds and develop new crop varieties."

   Increase subsidy from Rs 5,000 per ton to Rs 25,000 for purchase of seeds (onions and potatoes). Waiver on the payment of the annual premium in respect of the Crop Loss Compensation Scheme. Orchard owners to benefit from grant of 50% of the cost of permanent netting structures under the Fruit Protection Scheme. Companies in the agricultural sector that were directly affected by the COVID-19 to be eligible for loans at the concessional rate of 0.5 percent per annum from DBM.

4. **SMEs & Financing**: DBM Ltd has earmarked Rs 10 billion to support distressed SMEs and cooperative societies and to provide loans of up to Rs 10 million per company at a concessional rate of 0.5 percent per annum. To encourage local production, the grant under "Made in Moris" label will be increased from Rs 5,000 to a maximum of Rs 50,000. SMEs holding the 'Made in Moris' label will benefit from a margin of preference of 40% instead of 30%. Creation of a Technology and Innovation Fund to invest up to Rs 2 million as equity in projects recommended by the MRIC. Launching of a Campus Entrepreneur Challenge competition by the DBM to promote a culture of entrepreneurship among our university students (best projects to be financed at a concessional rate of 0.5 percent per annum for an amount of up to Rs 500,000). The Investment Support Programme (ISP) Ltd will subsidize fifty percent of the factoring fee per invoice for SMEs. Cooperative societies and SMEs will benefit from a grant of 15% on the cost of assets of up to a maximum of Rs 150,000 under the DBM Enterprise Modernisation Scheme. In order to boost local productions, the Cooperatives Development Fund will provide a grant of up to Rs 50,000 to cooperative societies for the following:

   a) the purchase of livestock; and

   b) acquisition of equipment involved in the production of food items.

[30] Government of Mauritius (2020-2021). 'Budget Speech'. Available at: <https://mof.govmu.org/Documents/Documents/Budget%202020-2021/Budget%20Speech%202020-2021%20%28English%29.pdf>.

Budget 2021-2022[31]:

1. **Land use**: In order to boost agricultural productions, 1,000 arpents of land will be made available to private growers through the Centralised Digital Land Bank.

2. **Mechanisation**: Fleet of tractors of the Agricultural Management Unit under the MCIA to be renewed for a cost of Rs 36 million. Land Mechanisation Support Scheme also applicable to planters having recourse to MCIA registered private tractor operators. A grant of Rs 10,000 to be offered to tea cooperatives for the acquisition of tea harvesters and the winter allowance will be maintained. Planters will be eligible to leasing facilities under the Transformation Fund from IFI for the acquisition of Single/Double Space Cabin Vehicles.

3. **Schemes & Financing**: Subsidy of 50% still maintained on the prices of potato and onion seeds and extended to seeds for the production of garlic and pulses. Guaranteed price mechanism for onion, garlic and potatoes for producers to be established by the Agricultural Marketing Board (AMB). Extension of the Sheltered Farming Scheme to charitable institutions, primary schools and colleges. DBM Backyard Gardening Loan Scheme to be increased from Rs 20,000 to Rs 100,000. Planters will be eligible to loan schemes from the DBM such as the following:

   a) Rs 100,000 interest-free loan for cashflow issues; and

   b) A 0.5 percent COVID-19 Special Support Scheme of up to Rs 1 million.

   An amnesty programme to be developed by the DBM to assist planters facing difficulties paying their loans.

4. **Agro-Processing Sector**: Setting up of an Agro-Processing Zone at Wooton with the assistance of the African Development Bank including infrastructure and equipment for processing to warehousing and put at the disposal of SMEs, cooperatives and businesses.

5. **Livestock**: The subsidy on animal feed will be doubled from Rs 4 per Kg to Rs 8 per Kg. Increase in the financial incentive from Rs 5,000 to Rs 7,500 per calf under the Calf Productivity Scheme. Promote the production of venison locally and mobile slaughterhouse facilities will be authorised for deer breeders. For the purpose of training, breeding and re-export, import duties on animals will be zero-rated VAT and exempted (including registration duty). The pasture scheme will be extended to cover areas up to 50 arpents.

6. **SMEs and Entrepreneurship**: Government will:

   a) Sustain the payment of wages through the financing of the salary compensation of Rs 375 monthly for fiscal year 2021/22.

   b) Extend the exemption on trade fees not exceeding Rs 5,000 for an additional 5 years.

   c) Grant an amnesty on trade fees and related penalties and interests that were due before 1st January 2020.

   d) Extend the Tax Arrears Settlement Scheme for SMEs up to December 2021.

   e) Increase the total maximum grant across all schemes implemented by SME Mauritius Ltd from Rs 150,000 to Rs 200,000.

A 110% deduction will be allowed on the taxable income for purchase of products manufactured locally by SMEs. The DBM Ltd will construct an SME Industrial Park of 5,000 square metres at Solferino in addition to Plaine Magnien and Vuillemin. SMEs will also be eligible to the following loan schemes from the DBM:

   a) Rs 100,000 interest-free loan for cashflow issues; and

   b) A 0.5 percent COVID-19 Special Support Scheme of up to Rs 1 million.

The DBM will earmark an amount of Rs 1 billion to provide loan facilities of up to Rs 5 million to retailers with turnover of up to Rs 250 million at a concessional rate of 3.5 percent per annum. The EDB will set-up an online marketplace for start-ups to showcase their products and services.

[31] Government of Mauritius (2021-2022). 'Budget Speech'. Available at: <https://mof.govmu.org/Documents/budget2021_22/2021_22budgetspeech_english.pdf>.

APPENDIX 4

Schemes from FAREI, AMB and SFWF.

Existing/Previous schemes

- Agricultural Calamity Solidarity Scheme – Breeder (ACASS) – SFWF;
- Agricultural Calamity Solidarity Scheme- Planter (ACASS) – SFWF;
- Bee Keeping Scheme – Food Security Fund;
- Cattle Breeding Scheme – Food Security Fund;
- Compost Subsidy Scheme – SFWF;
- Crop Nursery/Curing Scheme – FAREI;
- Family Farming Micro-Project Scheme (Livestock) – FAREI;
- Family Farming Micro-Project Scheme (Crop) – FAREI;
- FORIP Scheme – FAREI;
- Freight Rebate Scheme – AMB;
- Fruit Protection Scheme – FAREI;
- Garlic Seed Purchase Scheme 2014 – AMB;
- Goat/Sheep Multiplier Farm Scheme – Food Security Bond;
- Onion Seed Purchase Scheme 2014 – AMB.

Schemes from FAREI, AMB and SFWF.

Existing schemes

- Internal Capacity Development Scheme
- Technology and Innovation Scheme
- SME Marketing Support Scheme
- Inclusiveness and Integration Scheme
- SME Utility Connection Assistance Scheme

Schemes from DBM.

Aim of scheme - To finance projects in the following sectors	Remarks
• Sugar cane – plantation, replantation, de-rocking, mechanisation, irrigation, faisancevaloir, multipurpose • Vegetable, fruit and flower - plantation, mechanisation, de-rocking and irrigation • Tobacco cultivation • Livestock breeding • Transport – utility vehicle • Fishing, including bank fishing and aquaculture • Agro-processing, food preservation and other agricultural diversification projects • Seafood hub	• Maximum Loan Amount: 80% of project cost up to a ceiling of Rs 5 Million • Interest Rate: Repo Rate + 3 % p.a • Repayment Period: Up to 7 years • Moratorium Period: Up to 2 years
Security	**Eligibility**
• General Floating Charge and/or Fixed Charge on immovable property • Pledge of sugar proceeds or bad weather allowance, where applicable • 'Gage sans deplacement' on vehicle, where applicable • Mortgage on fishing vessel, where applicable • Pledge of rights to the lease, where applicable • Fixed Charge on Pledge of rights to the lease • Any other collateral security acceptable to the DBM • Decreasing Term Assurance	• Planters/farmers registered with AREU, SPWF, SIFB, FSC • Operators registered with the MOAIFS • Operators registered with the Ministry of Fisheries • Other operators in the agribusiness, fishing and seafood hub sector holding valid licenses • Other projects recommended by AREU

New loan schemes.

- SME COVID-19 Special Support (*maximum of Rs1.0M - 0.5% interest*) without guarantee (Table 5)
- SME Interest-Free Loan (*maximum of Rs 100,000*) without guarantee
- New Amnesty Scheme

APPENDIX 5

Reasons provided by respondents as to why they think there is not enough promotion of local agricultural products by the government.

Livestock	Responses
1.	Not enough campaigns to encourage people to eat local food products.
2.	Because the importers give more money to authorities as tax.
3.	We do our own promotion. Nothing is being done by the authorities. Statistics are available for justification.
Planters	**Responses**
1.	There are no attractive schemes for production of food in Mauritius.
2.	Lack of dynamism and pro-activeness.
3.	Lack of programmes on TV and radios to sensitise population on benefits of consuming bio-organic products, local fruits, vegetables, fresh milk.
4.	More imports than exports in the country.
5.	There is no master plan, no ecosystem, all is connected and no one seems to look at that and how to help at this level, interconnection.
6.	There is no common vision of the Mauritian food system. The motion to build a resilient local food system is too slow and seems to be too convoluted.
7.	No support on agro transformation. Most farmers still sell fruits and vegetables, very few go into transformation business because of a lack of knowhow, machinery and funds.
8.	There is no direct dialogue with the farmers.
9.	Most of our local fruits are exported and we import a large amount of vegetables that can be produced locally.
Dairy	**Responses**
1.	Not enough public awareness campaigns on the local goods.
2.	The government does not listen to the problems of the farmers.
3.	Not enough land allocated to grow fodder.
4.	Lack of exposure of the sector to the new generations.
5.	No control/follow up on the productions. No advertisements to encourage the population to eat local produce.
6.	Not enough awareness programmes to encourage consumption of local food.
7.	Lack of advertisement from the government. Prices of feed too high.
8.	Too much import of milk over the use of local milk. Lack of support from the government to increase the business productions.
9.	No advertisement related to the sector. No improvement in the production in the sector.
10.	Lack of milk production facilities. Lack of veterinary expertise.
11.	No help from government to increase the production of milk.
Apiculture	**Responses**
1.	No proper support for those who want to operate their business.
2.	Land, equipment and loan facilities are not available.
3.	More expert service extension on sites to help producers.
4.	Lack of field visits. Information from producers is not passed on. They do not care for situation after climate issues, etc. No technical support.
5.	Lack of sensitization campaigns to encourage the use of local products.

APPENDIX 6

Comments from participants on the lack of interest among the younger generations in agricultural practices:

1. I think youngsters nowadays don't like to get their hands dirty and do the hard part of farming that is ploughing the land, watering every day, etc.

2. Many may try but quit after facing challenges. It is something that should be learned and skills developed with patience and experience.

3. Older generations have had bad experiences in this sector and so will not encourage the new generation into it.

4. Younger generations like to work in the office; don't have time to work on field. Even those who are unemployed undervalue the job of being a farmer.

5. There are too many obstacles for youth to invest themselves in the Mauritian food system.

6. A young person doesn't get a loan unless he has a house as collateral guarantee. Access to agricultural land is difficult.

7. Lack of facilities/support from authorities in the business. Lack of advantages to the farmers. Lack of financial assistance to the business.

8. Unfortunately, throughout the years authorities have rendered agricultural practices as not profitable. Younger generations are not to be blamed.

9. They don't have knowledge. Maybe they are not aware of the advantages of agricultural practices. Most importantly, they need patience and love for this work.

10. Lack of encouragement and exposure of this sector to the young people.

11. Not enough information is shared within the education curriculum. Young generations are not exposed enough to the sector. Poor training available in agricultural sector.

Educated youth don't to work in fields. All want white collar jobs. More interest in technology, mechanical and internet-based jobs. Nowadays technology has taken over the workforce."

APPENDIX 7

Awareness of schemes proposed by institutions for each sector.			
Sector	Aware (%)	Unaware (%)	Beneficiaries (%)
Agro processors			
Internal Capacity Development Scheme	0.0%	100.0%	0.0%
Technology and Innovation Scheme	11.8%	88.2%	0.0%
SME Marketing Support Scheme	29.4%	70.6%	5.9%
Inclusiveness and Integration Scheme	0.0%	100.0%	0.0%
SME Utility Connection Assistance Scheme	5.9%	94.1%	0.0%
Family Farming Micro-Project Scheme (livestock) - FAREI	11.8%	88.2%	0.0%
Family Farming Micro-Project Scheme (crop) - FAREI	12.5%	87.5%	0.0%
Mechanisation, de-rocking and irrigation	11.8%	88.2%	0.0%
Agro-processing, food preservation and other agricultural diversification projects	29.4%	70.6%	0.0%
SME COVID-19 Special Support (max Rs 1 million) without guarantee	37.5%	62.5%	0.0%
SME Interest-Free Loan – without guarantee	35.3%	64.7%	0.0%
Heifer Productivity Incentive Scheme	0.0%	100.0%	0.0%
Upgrading of livestock farm	5.9%	94.1%	0.0%
Pasture Development	0.0%	100.0%	0.0%
Compost Subsidy Scheme	17.7%	82.4%	0.0%
Apiculture			
Bee Keeping Scheme - Food Security Fund	40.0%	60.0%	6.7%
Internal Capacity Development Scheme	14.3%	85.7%	0.0%
Technology and Innovation Scheme	28.6%	71.4%	0.0%
SME Marketing Support Scheme	42.9%	57.1%	0.0%
SME Utility Connection Assistance Scheme	28.6%	71.4%	0.0%
Mechanisation, de-rocking and irrigation	33.3%	66.7%	0.0%
Agro-processing, food preservation and other agricultural diversification projects	26.7%	73.3%	0.0%
SME COVID-19 Special Support (max Rs 1 million) without guarantee	40.0%	60.0%	0.0%
SME Interest-Free Loan – without guarantee	40.0%	60.0%	0.0%
Dairy & Livestock			
Cattle Breeding Scheme	32.3%	67.7%	3.2%
Family Farming Micro-Project Scheme (livestock)	16.7%	83.3%	0.0%
Goat/Sheep Multiplier Farm Scheme – Food Security Bond (livestock only)	33.3%	66.7%	8.3%
Mechanisation, de-rocking and irrigation	28.6%	71.4%	0.0%
Agro-processing, food preservation and other agricultural diversification projects	14.3%	85.7%	0.0%
SME COVID-19 Special Support (max Rs 1 million) without guarantee	21.4%	78.6%	0.0%
SME Interest-Free Loan – without guarantee	13.8%	86.2%	0.0%
Heifer Productivity Incentive Scheme	67.7%	32.3%	54.8%
Upgrading of livestock farm	13.0%	91.3%	0.0%
Pasture Development	12.5%	87.5%	0.0%

Planters			
Bee Keeping Scheme – Food Security Fund	32.3%	67.7%	3.2%
Freight Rebate Scheme – AMB	16.7%	83.3%	0.0%
FORIP Scheme – FAREI	33.3%	66.7%	8.3%
Fruit Protection Scheme – FAREI	28.6%	71.4%	0.0%
Garlic Seed Purchase Scheme 2014 – AMB	14.3%	85.7%	0.0%
Onion Seed Purchase Scheme 2014 - AMB	21.4%	78.6%	0.0%
Potato Seed Purchase Scheme - AMB	13.8%	86.2%	0.0%
Sugar cane – plantation, re-plantation, de-rocking, mechanisation, irrigation, faisancevaloir, multipurpose	67.7%	32.3%	54.8%
Vegetable, fruit and flower - plantation, mechanisation, de-rocking and irrigation	13.0%	91.3%	0.0%
Agro-processing, food preservation and other agricultural diversification projects	12.5%	87.5%	0.0%
SME COVID-19 Special Support (max Rs 1 million) without guarantee	12.5%	87.5%	0.0%
SME Interest-Free Loan – without guarantee	12.5%	87.5%	0.0%
Subsidy on Agricultural Mechanization Scheme - SFWF	12.5%	87.5%	0.0%

Sections in green represent institutions such as AMB, FAREI, etc; in blue is the DMB and in orange is the SFWF.

APPENDIX 8

Sector-specific results

Planters

Percentage of farmers growing a variety of crops.	
Vegetables	**Respondents in %**
Tomato	50.00%
Carrot	33.33%
Eggplants	40.48%
Potato	11.90%
Onion	16.67%
Chili	61.90%
Herbs and condiments	57.14%
Sugarcane	9.52%
Pumpkin	40.48%
Cabbage	45.24%
Anguive	19.05%
Cucumber	42.86%
Garlic	14.29%
Ginger	26.19%
Peanuts	21.43%
Tea	0.00%
Other	45.24%

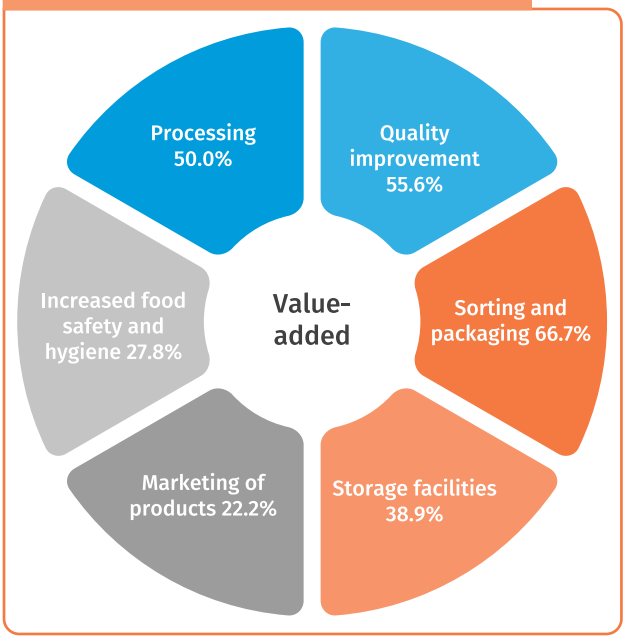
Other include: Patty pan squash, pineapples, lettuce, pak choi, bottle gourd, peppers, cucumber, ladyfinger, watermelon, banana, among others.

It was observed that most sales of their harvests occurred at the 'bazar' (market – 57.9%), "L'encan" (auction market – 42.1%) and the street side (31.6%) respectively. A vast majority of the planters tend to sell their products immediately after harvesting (95.1%). Otherwise, they store the vegetables mostly on-site or in storerooms (54.6% vs. 27.3%, respectively).

Agro processors

This project registered various types of products created by agro processors, such as snacks, chilli paste, jam, pickles, and processed octopus, among others. Items are usually purchased from local suppliers (72.2%) or producers (88.9%). A few of them tend to act as producers as well, through their own farm practices (44.4%). Once processed, the storeroom is the preferred location for keeping the food commodities over refrigerators (64.3% vs. 42.9%, respectively).

Figure 23. Value-added by the agro processors to products before distribution.



Dairy & livestock

There is a daily production of milk and the farmers make it a must to sell the milk immediately after collection as it is a rapidly perishable food item. Some would keep the milk in refrigerators and even fewer possess cooling tanks. A more serious matter observed was that nearly all of the dairy farmers did not process their milk before selling it, which is a very dangerous practice.

The situation is different in the livestock industry, which is mainly driven by beef, goat and poultry production. The production of cattle is mainly driven by the religious festival of "Eid al-Adha", usually celebrated in the period of June-July, where most sales are made. On the other hand, poultry production is all year round, leading to a low perception of seasonality in production and sales (41.7%).

Figure 24. Characteristics of the local milk production sector.

Cow breeds used in the sector	• Friesian - 94.7% • Jersey - 52.6% • Creole - 26.3% (local breed) • Cross - 26.3%
Milk storage facilities	• Sell immediately - 73.7% • Storeroom - 5.7% • Refrigerator - 15.8% • Cooling tank - 5.3%
Milk processing and pasteurization	• 94.7% do not process milk before sale (no filtration / pasteurization) • 89.5% do not possess pasteurization equipment / facilities

The Friesian breed is a renowned cattle breed for the production of high quantity and good quality milk. The Jersey breed also produces good quality milk but of noticeable lower volumes. However, this breed is more efficient in feed conversion and thus requires less in take (Lembeye et al., 2016).

Apiculture

Beekeeping is very different from the other activities in agriculture in terms of the type of animals involved, maintenance, attention, and the set of skills required. Nonetheless, this activity is very important for agriculture practices. Here in Mauritius, the beekeepers mainly keep the African bee and the hybrid. The primary products that all beekeepers produce and sell are honey, bee wax and honeycombs. Production has been deemed seasonal by the farmers due to flower availability and climatic conditions.

Figure 25. Characteristics of beekeeping in terms of species used, products and factors of influence.

Bee species	• 64.3% Hybrid of African and Italian bees • 57.1% African bee (*Apis melifera*) • 21.4% Italian bee (*Apis linguistica*)
Value-added products and services provided	• Honey - 100% • Bee wax - 33.3% • Honey comb - 20.0% • Propolis - 13.3% • Bee pollen - 6.7% • Royal jelly - 6.7% • Pollination services - 6.7% • Others - 13.3% (lollipops, soap, beekeeping equipment)
Factors affecting apiculture	• Climate change - 73.3% • Varroa mite (parasitic insect) - 46.2% • Bee grazing area - 53.3% (quantity of flowering plants)

The bee hybrid is the preferred choice of beekeepers for various reasons. The hybrid bee originates from crossing *A. melifera* and *A. linguistic bees*. The hybrid has more resistance to Varroa mite infestations, a characteristic that comes from the African bee. The Italian bee is known for its ability to produce good quality honey and is not so aggressive.

APPENDIX 9

The Partnership for Action on Green Economy (PAGE) supported the Government of Mauritius in carrying out the current study to support the Creation of an Enabling Environment and Incentives to Boost Sustainable Agro-Processing Industry, Including High Growth Potential SMEs in Mauritius. The aim of this study was to review the adoption and effectiveness of current governmental policies & schemes; as well as identify barriers to their adoption by local Small & Medium Enterprises (SMEs). This report is a product of a collaborative effort between UNIDO, the Ministry of Agro-Industry and Food Security (MOAIFS) and the Food and Agricultural Research and Extension Institute (FAREI). The report proposes new policies that will help facilitate the productivity of SMEs identified and suggest new avenues for incentives other than tax. Principally the incentives recommended are specifically targeted towards technological advancement and innovation in the agro-processing industry.

The current agro-processing food chain in Mauritius was analysed, gaps were identified and recommendations proposed. The study also delved into the impact of COVID-19 on SMEs in the agro-processing sector and proposes a sustainable development plan for the current and any future crises.

Factors that influenced the production capacities of farmers following the onset of COVID-19.			
	Caused an increase	Caused a decrease	Had no influence
Agro processors			
Access to business site (despite curfew)	20.0%	46.7%	33.3%
Processing of agricultural raw materials	20.0%	26.7%	53.3%
Sales of products	18.8%	75.0%	6.3%
Number of employees on site	0.0%	6.7%	93.3%
Beekeepers			
Access to farms (despite curfew)	0.0%	20.0%	80.0%
Regular cleaning of farm premises	18.8%	12.5%	68.8%
Regular cleaning of farm equipment	12.5%	12.5%	75.0%
Number of employees on farms	0.0%	13.3%	86.7%
Dairy			
Access to farms (despite curfew)	5.3%	31.6%	63.2%
Access to fodder to be used as feed	0.0%	57.9%	42.1%
Irregular feeding of animals	0.0%	57.9%	42.1%
Irregular milking of cows	0.0%	36.8%	63.2%
Regular cleaning of farm premises and cows	0.0%	5.3%	94.7%
Regular cleaning of farm equipment	0.0%	5.3%	94.7%
Regular veterinary check ups	0.0%	22.2%	77.8%
Number of employees on farms	0.0%	0.0%	100.0%
Planters			
Access to plantations (despite curfew)	16.2%	51.4%	32.4%
Irrigation of crops	13.5%	32.4%	54.1%
Presence of crop diseases	16.2%	35.1%	48.7%
Application of fertilizers / pesticides / herbicides	16.7%	36.1%	47.2%
Sowing of seeds	25.0%	47.2%	27.8%
Harvesting of crops	19.4%	55.6%	25.0%
Preservation of harvested crops	11.1%	50.0%	38.9%
Sales of harvested crops	14.7%	61.8%	23.5%
Number of employees on fields	6.1%	48.5%	45.5%
Livestock			
Access to farms (despite curfew)	8.3%	16.7%	75.0%
Irregular feeding of animals	9.1%	9.1%	81.8%
Access to slaughterhouse	9.1%	9.1%	81.8%
Regular cleaning of farm premises	16.7%	8.3%	75.0%
Regular cleaning of farm equipment	18.2%	0.0%	81.8%
Regular veterinary check ups	18.2%	18.2%	63.6%
Number of employees on farms	10.0%	0.0%	90.0%

NOTES

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