



EXPERIENCE-SHARING BY SEYCHELLES ON NATIONAL TECHNOLOGY ASSESSMENT ON AGRIVOLTAIC TECHNOLOGY FOR CONTROLLED-ENVIRONMENT IN CROP PRODUCTION

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Ministry of Agricultre, Climate Change and Environment Mrs. Sara Estico Calderin Principal Policy Analyst





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## SEYCHELLES AT A GLANCE

- The Republic of Seychelles comprises a total 115 islands scattered over an exclusive economic zone (EEZ) of about 14 million km2 in the middle of the Western Indian Ocean, north east of Madagascar with a land mass of 455 km2.
- Population is 100,000 (2023 National Census)
- Seychelles is classified as a high income country, with a GDP per capita of USD 15,644 in 2013 (IMF, 2013).
- Seychelles imports more than 80% of its food needs thereby making it vulnerable particular to the external shocks. The key components of imports for 2023 were 'food, live animals & vegetable oils' accounting for 24 per cent, followed by 'mineral fuels', and 'machinery & transport equipment' each representing 23 per cent of the total value of imports
- Seychelle's economy is largely based on revenue from tourism industry 70% of foreign exchange earnings and about 25% of the GDP.
- Fishing Industry Tuna fishing and processing, accounts for close to 5% of total GDP, 7% of total employment, and around 35% of export goods. In 2023 Output from the fisheries sector expanded by 5.0 % as a result of a double-digit increase in fish catch (Central Bank of Seychelles Annual Report 2023)
- Other Sectors includes: Offshore services as growing sectors; manufacturing sector; telecommunications, agriculture etc.

# AGRICULTURE SECTOR BACKGROUND

- In Seychelles the availability of agricultural land, for both existing farming activity and further development, is very limited. 40% of land area is "protected" for environmental conservation reasons.
- Agriculture represents around 0.82% or 3.75 sq km of total land use and is governed through a land tenure system whereby lease is given to farmers with a 20 year renewal lease.
- In Seychelles there are a total of 679 registered farmers. The commercial agriculture is characterised by small farms averaging 0.5 hectare and rarely exceeding two hectares which undertake mixed farming.
- The majority of farmland (98%) is under open field cultivation, with only 7.2 hectares (2%) that have protected shade house infrastructure.
- At a national level, 65% of farms are located in mountainous areas whereas 30% are on flat land.
- Agriculture sector contributes slightly less than 2% to the country's gross domestic product at current market prices and in terms of food sovereignty, anecdotal evidence suggests that the sector accounts for a modest 10% of the country's total food demand (Agriculture Sector Strategy, 2023:1).
- The agricultural sector presently benefits from a panoply of institutional support which comprises of incentives in the form of subsidies, principally in the livestock sub-sector, tax concessions on the importation of capital equipment, low interest rate (2.5%) for loan under the Agricultural Development Fund (ADF) scheme, rental of agricultural land at only 0.32/sqm/year, Vat refund on imported and local agricultural products, etc.

# CHALLNEGES IN THE SECTOR

- Scarcity of land;
- Adverse seasonal climatic conditions (such monsoon rain, exuberant weed growth as well as the high incidence of pests and diseases that severely affect crops yields)
- Insularity
- Volatility in supply chain, lately being exacerbated by geopolitics
- High Dependency of imported food/vulnerable to price volatility
- High cost of production;
- Unfavorable topography for large scale mechanize crop production

## What is controlled-environment agriculture?

 Controlled-environment agriculture (CEA) -- which includes indoor agriculture (IA) and vertical farming

## What is fully-controlled environment crop production?

• It includes different farming methods compatible with closed-space or indoor agriculture, such as hydroponics, aeroponics, aquaponics, and vertical farms.

### Why agrivoltaick was selected ?

- This is very relevant to the context of Seychelles based on the challenges, the country faces in maintaining consistency of fresh crop production throughout the year;
- Seychelles has long been looking new technologies such as hydroponics and other climate smart agricultural technologies to address the issue of crop production

## TA POLICY IMPLICATIONS IN THE AGRICULTURE SECTOR

- Lately the Department of Agriculture is putting emphasis on high-tech agriculture as its overarching policy and strategic framework for its food and nutrition security in the face of those challenges that have been stated before;
- Agrivoltaics for controlled-environment crop production as the technology for the assessment comes at opportunity as the Department of Agriculture is encouraging investment in high-tech and climate smart agriculture while aiming to a net-zero food system;
- Based on the findings of TA pilot project a number of key policy recommendations have been made in order to successfully implement the agrivoltaics for controlled-environment;
- Those recommendations takes into account issues of regulations, infrastructure, capacity-building, the national system of innovation, governance, institutional set ups and investment framework;
  - Regulations: Despite the intent of the government to implement the technology, there are still regulatory gaps to be address the integration of PV in agriculture.
  - Infrastructure: The technology is capital intensive as it requires modern infrastructures. Those are not readily available locally. In this case, it favours the larger farming communities hence having a negative socio-economic impact;

- National System of Innovation (NSI): The mapping of NSI shows weak linkages amongst actors and stakeholders in system, which presents a problem for the implementation of technology. However, on policy perspective it presents a great opportunity to understand the synergies that are needed for a functional NSI to support the technology;
- Governance: Governance is key to the successful implementation of the technology. However, this aspect is needs major policy attention as weak governance is pervasive in the sector, which undermine investors confidence;
- Institutional Set ups: TA points to the needs of new institutional set ups to support the successful implementation of the technology;
- Investment framework: There is a need for a sound investment framework to support the technology due to the fact access to capital remains a vital problem for start-ups in the sector as as capital for business expansion;



Policy	Activities	Rational
Address the regulatory gaps to allow the integration of PV in agriculture	<ul> <li>The revised Agricultural Bill 2024. Approved in June 2024 by the Cabinet of Ministers. The bill repeal the Agriculture Act 1966.</li> <li>The Agricultural land allocation policy 2024-2030</li> </ul>	The Bill seeks to enhance the manage establish clear procedures to lease a to agricultural producers and process farming practices including soil and w security and incentivize research and impact of climate change and other the agricultural sector" Establishes clear guidelines for the a the standard operating procedures (S Emphasis to technology intergration/a farming all year round to meet the loc
	<ul> <li>The revised Agricultural Development Fund (ADF) Agreement</li> </ul>	the economy This credit facility will finance agricult productions whose promoters are reg relevant Government body. Total loar to 3 million. Above SCR 3 m the inter
Incentives in place	<ul> <li>The agriculture sector presently benefits from a number of institutional support</li> </ul>	<ul> <li>The institutional supports comprises</li> <li>Rental of agricultural land at only</li> <li>Tax concessions on the importati</li> <li>Vat refund on imported and local</li> <li>Incentives in the form of subsidie</li> </ul>

gement and legal protection of agricultural land, to agricultural land and grant financial resources sors, to provide support and promote sustainable water management, to ensure food and nutrition d innovation in the agricultural sector, to address the threats, whilst ensuring the long-term viability of the

allocation and utilization of agricultural land, including SOPs) for implementing the policy. adaptation and transfer for sustainable production

cal market demand and linkages to other sectors of

tural projects including livestock and agricultural input gistered farmers with the Agriculture Department or n amount SCR 5 million. Interest rate 2.5% for loan up rest rate is 5%.

of incentives such as: y SCR 0.32/ sqm/year

tion of capital equipment;

agricultural products;

es 9 principal in the livestock sub-sector)

# CONCLUSIONS



## • The UNCATD TA pilot project brought an opportunity for perspiratory research in formulating policies to support the implementation of new technologies in the agriculture sector.

• The selection of agrivoltaics for controlled-environment is relevant in the context of Seychelles based on numerous challenges that farmers face in order to have consistency in crop production throughout the year.

