

## OPINION

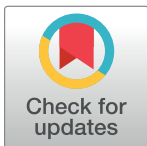
# A situational analysis of agricultural development, food, and livelihood security in Seychelles: Where to from here?

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There is a significant political will to increase agricultural productivity under climate change while reducing its environmental impact. Increasing resilient productivity and reducing emissions from agriculture are central components of 42 African countries' Nationally Determined Contributions [1]. Climate-Smart Agriculture (CSA), an approach to agricultural development that addresses the intertwined challenges of food security and climate change, is one of several solutions promoted by development practitioners [2]. CSA targets three objectives: (i) to sustainably increase agricultural productivity; (ii) build resilience food systems to climate change; and (iii), where possible, reduce greenhouse (GHG) emissions from agriculture [3]. For a technology to be CSA is based on its impact on these outcomes [3].

The climate-smart agriculture (CSA) concept reflects an ambition to achieve food security and broader development goals under a changing climate and to increase food production. In Seychelles, the agricultural sector is hampered by the prevalence of small farm sizes and climate-induced vulnerabilities such as saltwater intrusion on farmlands, soil erosion, crop pests and disease, rainfall variability, and a farming system dependent on irrigation [4]. As a granitic island, huge rocks on farmlands are typical of the agricultural landscape, reducing the farm area usable for cultivation [4]. These difficulties occur in an environment where about 50% of the land area is protected [5], and the expansion of agricultural land will result in deforestation. Seychelles has witnessed a shift from an economy historically supported by agriculture to tourism and fisheries as the main pillars of the economy since the opening of the international airport [6]. The industry's current state could be linked to almost 90% of imported food being consumed locally [7]. The COVID-19 pandemic and the Ukraine crisis exacerbated the food crisis in Seychelles with the disruption in the supply of food items and also rapidly rising food prices. These challenges have reinforced the need to boost local food production.

## CSA technologies and practices in Seychelles

The FAO documented several CSA technologies and practices farmers implement in Seychelles, including shade houses, intercropping, agroforestry, drip irrigation systems, erosion control measures, and planting drought-tolerant crops [6]. For example, growing *Chrysopogon zizanioides* (vetiver grass) in farmlands' upper or outer areas and drains and *Cymbopogon citratus* (lemon grass) at the edges of farmlands are specific erosion control measures among farmers in Seychelles. These CSA practices present opportunities for addressing climate change challenges and economic growth and development of the agriculture sector. According to the FAO report, several CSA practices have been adopted in isolation or combination,

covering a significant part (30–50%) of the agricultural area in Seychelles. Despite several efforts towards agricultural development, intensive diversification of agricultural production, productivity and competitiveness, self-sufficiency, and food security is far from being achieved [6]. Therefore, there is a need for a transformative agenda that goes beyond local or traditional practices that are climate-smart to technologies that allow for agricultural intensification.

### Land management and agricultural practices at a crossroad

Farmers in Seychelles have implemented different land management techniques, including planting lemon grass on the edges of farmlands to minimize erosion, terracing, use of manure and compost, crop diversification, shade houses, and agroforestry [4]. Despite using a wide range of land management techniques, agricultural lands in Seychelles faces several challenges. Seychelles has two agro-climatic zones based on biophysical characteristics—the mountainous (500–900 m) and coastal plateau (2–500 m) above sea level [6]. While red soils are common in the former zone, the latter is dominated by calcareous sandy soils [8]. The sandy soils on farmlands along the coast have low humus content and high infiltration capacity. Applying chemical fertilizers is one of the most potent practices from farmers' perspectives to improve their yields.

Also, there was a general perception among farmers that agroforestry is for those whose farmlands are found in the mountains where trees quickly grow. According to these farmers, the tree species they would like to plant on their farms do not grow promptly on sandy soils. During a visit to the farmland at Amitie, Praslin, on February 8, 2023 (see Fig 1), the farmer showed the researcher some potatoes baked in the sandy soil due to the scorching heat from the sun. Aside from competition from other land uses, farmlands along the coast are exposed to saltwater intrusion. Some farmers in the coastal zone of Mahe and Praslin have reported wilting of plants and their subsequent death from saltwater intrusion [9].

On the other hand, farmlands located on the mountainous terrain in Seychelles have their fair share of challenges. Large boulders are commonly found on most of the granitic islands of Mahe, Praslin, and La Digue. In some instances, these boulders can occupy as much as half of the area of farmland. Most farms on sloppy and mountainous terrain are affected by severe soil erosion, primarily when farmers have not implemented effective land management techniques [4]. Removing large boulders from farmlands is a common practice to create more cultivable land. For example, an ongoing Ridge-to-Reef project by the UNDP provides technical support to farmers willing to remove boulders from their farmlands with the help of tractors and excavators [10].

### Local versus imported food—a double-edged sword

Seychelles is still very much dependent on food importation, and the island nation imports 90% of what is consumed locally [7]. While there are increases in meat production, for example, 500 of the 1500 tonnes of pork meat consumed annually is produced locally [11], crop production still lags. The development of the tourism sector has considerably extended the market for food products, which in some cases compete unfavorably with locally grown food crops that are more expensive than those imported. Locally grown cabbages are more costly than those imported, and such a disparity in pricing could be linked to factors such as cost and scale of production. Another crucial challenge facing local food production is human resource capacity. An aging population drives agricultural production [6], with over 70% of farmers in Seychelles aged 50 years and above. The youthful population trained in modern production techniques is few and often chooses a different career path after training. Whereas several household members actively participate in agriculture in other African countries [12], the situation in Seychelles differs, with little engagement from family members.



**Fig 1. Farmland in Amitie, Praslin Island, consists mainly of sandy soils.**

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On the other hand, farmers can afford to secure the services of casual laborers, while a few have hired expatriate workers permanently. Hired labor further increases the cost of production amidst a market situation often flooded with similar agricultural produce, thereby lowering the price significantly paid by consumers. Moreover, the low level of conservation and processing of the leading agricultural products generally results in relatively high post-harvest losses [6]. A significant problem in this regard is the inadequate technology for processing and conserving perishable foodstuffs and the high cost of existing technologies. Crop pests and diseases further affect the quality of produce of farmers. For example, locally produced food, especially vegetables, faces threats from the melon fly, *Bactrocera cucurbitae*. The melon fly is a serious agricultural pest in many countries, including Seychelles, which affects the quality and quantity of locally produced vegetables [13]. Minimizing the effects of the melon fly has the potential to reduce losses from food grown locally by farmers while enhancing the availability of quality products that can compete favorably in the market.

For imported food items, the production scale reduces the cost of production, especially as mechanized agriculture is commonly practiced in most countries where food is imported. In November 2022, the FAO implemented a five-day workshop on the assessment of the quality

of food produced or imported in Seychelles using the Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) assessment tool [14]. Why such moves are essential, it's crucial to reiterate that boosting local food production will require investment in agricultural technologies. Technology is the way to overcome climatic and non-climatic barriers to sustainable farming. Large-scale hydroponic farms and aquaculture have significantly boosted local food production in the United Arab Emirates [15]. Farmers and agricultural stakeholders in Seychelles can learn lessons from the UAE on how Climate-Smart technologies can enhance local food production.

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