



ENHANCING TANZANIA'S COMPETITIVENESS AND EXPORT DIVERSIFICATION IN SEAWEED

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Abbreviations and acronyms

| | |
|---------|---|
| ACP | African, Caribbean, Pacific Group of States |
| AIPH | Association of Horticulture Procedures |
| ASA | Agriculture Seed Agency |
| ASDP2 | Agriculture Sector Development Programme Phase II |
| AMCOS | Agriculture Marketing Co-operatives Societies |
| ANSAF | Agriculture Non State Actors Forum |
| ASTA | American Spice Trade Association |
| AVRD | World Vegetable Centre |
| B2B | Business-to-Business |
| BOT | Bank of Tanzania |
| BTC | Belgium Development Agency |
| BRN | Big Results Now |
| CBI | Centre for Promotion of Imports |
| COMESA | Common Market for Eastern and Southern Africa |
| CPUS | Centralised Processing Units |
| CSOD | Clove Stem Oil Distillery |
| DADPS | District Agriculture Development Plans |
| DFI | Development Finance Institutional |
| DRC | Democratic Republic of Congo |
| EAC | EAn Community |
| EBA | Everything but Arms |
| ESA | Economic and Social Research Foundation |
| ESRF | Economic and Social Research Foundation |
| EU | European Union |
| FAO | Food and Agriculture Organisation of the United Nations |
| FDI | Foreign Direct Investment |
| FLA | Flower Logistics Africa |
| FLORINT | International Florist Organisation |
| FOB | Free on Board |
| FSI | Floriculture Sustainability Information Network |
| FYDP | Five-Year Development Plan (First and Second, Government of Tanzania) |
| GAIN | Global Agricultural Information Network |
| GAP | Global Agricultural Practices |
| GDP | Growth Domestic Product |
| GHI | Global Horticulture Initiative |
| GI | Geographical Indications |
| GMP | Good Manufacturing Practice |
| GTIS | Global Trade Information Service |
| HACCP | Hazard Analysis Critical Control Points |
| IAPRI | Indaba Agricultural Policy Research Institute |
| ICO | International Coffee Organisation |
| IFAD | International Fund for Agricultural Development |
| IMO | Swiss Institute of Market Ecology |
| ISCP-Tz | Innovations Systems and Clusters Programme in Tanzania |
| ISO | International Standards Organisation |

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| ISTA | International Seed Trade Association |
| ITC | International Trade Centre |
| JNIA | Julius Nyerere International Airport |
| KNCU | Kilimanjaro Nature Cooperative Union |
| LDC | Least Developed Country |
| LGAs | Local government authorities |
| MAFAP | Monitoring African Food and Agriculture Policies Project |
| MIS | Market Information System |
| MIT | Massachusetts Institute of Training |
| MTC | Meristematic Tissue Culture |
| MKUZA | Zanzibar Strategy for Growth and Reduction of Poverty |
| MSMEs | Micro, small and medium-sized enterprises |
| MITI | Ministry of Industry, Trade and Investment |
| MT | Metric Tonnes |
| MVIWATA | Network of Farmers Association in Tanzania |
| NCSC | National Coffee Stakeholder Committees |
| NGOs | Non-Government Organisations |
| NTB | Non-Tariff Barriers |
| NSSF | National Security Fund |
| NTM | Non-Tariff Measures |
| OCGS | Office of the Chief Government Statistician |
| PAHS | Polycyclic Aromatic Hydrocarbons |
| PDO | Protected Designation of Origin |
| PLA | Perishable Logistics Africa |
| PPP | Public-Private Partnership |
| QFP | Quality Food Products |
| QI | Quality Infrastructure |
| REPOA | Research on Poverty Alleviation |
| SACCOs | Savings and Credit Co-operatives |
| SADC | South African Development Community |
| SAGCOT | Southern Agricultural Growth Corridor of Tanzania |
| SAI | Social Accountability International |
| SAP | Strategic Action Plan |
| SDGs | Sustainable Development Goals |
| SISO | Sisal Smallholder and Outgrower |
| SMETABPG | Sedex Members Ethical Trade Audit Best Practice Guidance |
| SPS | Sanitary and Phytosanitary |
| SUA | Sokoine University of Agriculture |
| SWIOFish | South-West Indian Ocean Fisheries Governance and Shared Growth Programme |
| TaCRI | Tanzania Coffee Research Institute |
| TAHA | Tanzania Horticultural Association |
| TAT | Technical Assistance Team |
| TANTRADE | Tanzania Trade Development Authority |
| TAWOCA | Tanzanian Women In Coffee Association Ltd. |
| TAZOP | Tanzania Organic Products |
| TBS | Tanzania Bureau of Standards |
| TBT | Technical Barriers to Trade |
| TCA | Tanzania Coffee Association |

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| TCB | Tanzania Coffee Board |
| TCDF | Tanzanian Coffee Development Trust Fund |
| TCGA | Tanganyika Coffee Growers Association |
| TCV | Tanzania Development Vision |
| TFDA | Tanzania Food and Drugs Authority |
| TFRA | Tanzanian Fertiliser Regulatory Agency |
| TIC | Tanzanian Investment Centre |
| TMEA | TradeMark East Africa |
| TOAM | Tanzania Organic Agriculture Movement |
| TOSCI | Tanzania Food and Drug Authority |
| TPRI | Tanzanias Tropical Pesticides Research Institute |
| TSA | Tanzanian Sisa Authority |
| TSB | Tanzania Sisal Board |
| TTFA | Transit Transport Facilitation Agency |
| UC | University of California |
| UNDP | United Nations Development Programme |
| UNIDO | United Nations Industrial Development Organization |
| URT | United Republic of Tanzania |
| USAID | United State Agency for International Development |
| USDA | United States Department of Agriculture |
| VET | Vocational Educational Training |
| WIPO | World Intellectual Property Organisation |
| WTO | World Trade Organization |
| ZaSCI | Zanzibar Seaweed Cluster Initiative |
| ZATI | Zanzibar Agricultural Transformation Initiative |
| ZBS | Zanzibar Bureau of Standards |
| ZMTIM | Zanzibar Ministry of Trade, Industry and Marketing |
| ZOSG | Zanzibar Organic Spice Growers' Association |
| ZSCs | Zonal Stakeholder Committees |
| ZSTC | Zanzibar State Trading Corporation |

EXECUTIVE SUMMARY

This report presents the findings of a Technical Assistance project *‘Targeted support to strengthen capacity of policymakers, exporters, and trade associations to assess and review trade and related economic policies to promote trade competitiveness and diversification for widening trading opportunities with the EU’*, funded by the European Union (EU) through the EU-ACP TradeCom II Programme. The overall objective of the programme is to contribute to sustainable economic development and poverty reduction in the United Republic of Tanzania through closer regional integration and increased participation in the global economy.

Part I of the report was prepared to contribute to the project by identifying and proposing responses to the bottlenecks to improving competitiveness and diversification in selected agricultural export-oriented sectors along Tanzania’s main export corridors. Part I of the report constitutes was prepared a separate document.

Using a case study and value chain analysis approach, this report examines agricultural competitiveness and export diversification in context of the seaweed sub sector, adopting Zanzibar as a case study area.

The report scrutinises ways to improve competitiveness in the seaweed value chain:

Enhancing competitiveness and export diversification of the seaweed value chain

- Until recently, seaweed accounted for 90% of Zanzibar marine product exports, representing about 25% of overall exports, being the third largest contributor to GDP after the tourism and clove sectors. Seaweed farming currently employs 25,000 people – 80% of them are rural women – with over 150,000 people benefiting indirectly from the seaweed industry. Sector output and quality has been in decline over the last decade, and without intervention the sector faces a low-growth future.
- The seaweed industry along the Zanzibar Export Corridor faces a combination of threats due to climate change and unsustainable production methods that only focus on seaweed harvesting without concomitant replenishment (the common pool problem). Other sector challenges include poor governance and environmental degradation of seaweed habitat due to climate change, diseases such as epiphytes colonisation, weak production and export capacity, and decline in export prices. The huge decline in seaweed prices in export markets is largely attributed to monopolistic behaviour by a few international buyers who export to their mother companies (in the USA and Europe) for processing, and the surge in seaweed supply from Indonesia and China.
- Potential in seaweed value addition remains underutilised. Zanzibar produces less than half of the 100 by-products of seaweed due to poor postharvest handling, processing, packaging and storage.

Box 1: Seaweed – key recommendations

- i. Supporting improved production, harvesting and training on deep-water cultivation techniques, such as using Cottonni varieties. It would help increase yields and double the production to at least 20,000 MT.
- ii. Increasing investment in processing facilities and better packaging. It would increase production of high-quality value-added by-products such as seaweed soap, snacks, extracts, cosmetics and candles to the tourism sector and local supermarkets.
- iii. Mitigating the impact of global prices by diversifying into sales of value-added seaweed products in high-value markets such as the EU.
- iv. There are gaps in the in the seaweed policy environment and regulatory framework, that continue to undermine competitiveness and growth of the subsector. As a starting point, a separate seaweed development policy framework would be beneficial, with specific mechanisms, actions and resources for implementation indicated.
- v. If such a framework is prepared, a comprehensive implementation and capacity-building strategy could be developed to build the production and trade capacity of seaweed value chain actors towards enhancing their competitiveness, diversification, standards compliance and value chain upgrading.

Value chain analyses undertaken by the programme identified various success factors and initiatives that could be replicated in order to enhance competitiveness across the different value chains with a major focus on the production segment and marketing (see box s for further details).

Box 2: Best practices

In terms of lessons from good practices it is important to:

- i. Identify and adopt the champion approach to strengthen associations that will dramatically advance primary producers' interests towards overcoming institutional bottlenecks and enhancing value chain activities as well as to promote more effective extension services and information delivery.
- ii. Support business-to-business and public-private partnerships to drive competitiveness, industrialisation, economic transformation and human development.
- iii. Introduce district-level technological and quality infrastructure platforms.
- iv. Improve district and sector planning, i.e. every district must review and approve a comprehensive plan for value chain upgrading and agricultural trade expansion.
- v. Enhance smallholders' participation in high-end value chains.
- vi. Promote product branding and better use of biotechnology and biosafety.
- vii. Promote the synergies between agribusiness and tourism development, including agri-tourism initiatives.
- Viii. Support a national and international multi-stakeholder approach in the provision, implementation and enforcement of the appropriate regulations and legislations across the value chain.

This report looks into the seaweed value chain. Using a value chain approach, a detailed review of the performance and competitiveness potential of the selected export-oriented agricultural subsector was undertaken. The last chapter provides summary, policy recommendations and strategies for implementing the recommendations.

1 INTRODUCTION AND BACKGROUND

1.2 The ACP-EU TradeCom II Programme

The European Union (EU) supports improvements in competitiveness and exports in Tanzania's agriculture sector through the TradeCom II Programme. This programme, which was approved following a request from the African, Caribbean and Pacific (ACP) Group of States, is designed to facilitate the integration of ACP countries in the global economy and value chains by improving their capacity to formulate and implement suitable trade policies, participate effectively in multilateral trade negotiations under the World Trade Organization (WTO) and to implement the trade agreements to their benefit, and strengthen their competitiveness.

The TradeCom II Programme has translated the needs of ACP beneficiaries into a number of relevant and implementable projects. This includes the project for which this report has been prepared. The *'Targeted support to strengthen capacity of policymakers, exporters, and trade associations to assess and review trade and related economic policies to promote trade competitiveness and diversification for widening trading opportunities with the EU'* project contributes to sustainable economic development and poverty alleviation through closer regional integration and increased participation in the global economy.

1.3 Zanzibar Export Corridor

The Zanzibar Export Corridor has direct access to the Indian Ocean and close proximity with the international sea and airports in Unguja, Zanzibar. Zanzibar's booming sectors are spices, cloves, nutmeg, cinnamon, black pepper, seaweed and tourism (the latter being a major foreign currency earner). This largely explains why Zanzibar, together with Tanzania's Mafia Island, are often referred to as the 'Spice Islands'. Zanzibar has a large fishing and dugout canoe production. In addition to the possible oil resources, the government has established a free port area since 2000. However, the seaweed value chain remains poorly developed and suffers from policy neglect. It is over-dependent on subsistence agricultural methods and suffers from weak production capacity, poorly resourced and fragmented trade support institutions, all of which constrain competitiveness and diversification.

To unlock growth and export competitiveness of the seaweed sector, it is critical to reform the loosely coordinated and fragmented seaweed value chains into better organised structures utilising economies of scale; enhance production capacities throughout the seaweed value chain; upscale organic certification of seaweed products (including varieties and by-products) and develop product quality standards to meet export market requirements in high value markets; strengthen institutional capacities and address policy weaknesses. As a point of departure, it is paramount to design and implement the sector's development strategies independently of the recently enacted 2020 Zanzibar Blue Economy Policy. This can be done through a dedicated seaweed sector development policy and strategy not supplanted by

1.4 Methodology and approach

To achieve the programme objectives, REPOA and ISS Erasmus employed a multipronged approach that involved both primary data collection, secondary data analysis and cross-checking the various data sources for consistency. Primary data were gathered from structured interviews with stakeholders (private sector actors and government officials) and value chain actors along the Zanzibar export corridors. Key secondary sources of information, (policy and strategy documents) and academic studies on the subject were studied. A case study approach was also adopted to achieve a greater understanding of the issues investigated and provide fresh insights on them through development of case studies.

The methodology was designed to comprehensively capture the programme goals, combining quantitative and qualitative sources. Three major methodological areas of concentration include:

1. Trade policy analysis and development of policy frameworks for trade, SPS, standards, and quality management¹;
2. Value chain analysis with emphasis placed on supply-side constraints in the upstream segments; and
3. Capacity building, research and awareness creation/dissemination.

The methodology placed strong emphasis on the programme objectives, while strategically supporting the beneficiaries to develop effective policy and advocacy tools for increasing competitiveness of primary producers and diversification of the export base (focusing on selected value chains) to take advantage of market access opportunities in the EU.

Value chain analysis

Value chain analysis is an effective tool for understanding competitiveness and to identify sources and constraints for competitive advantage for selected products and subsectors in Tanzania. Value chain analysis focuses on the market context of identifying bottlenecks across upstream and downstream segments. It also looks at broad public policy, institutional and infrastructure factors that produce constraints in the enabling business environment. By examining and mapping a value chain from production, through delivery to the end market, strategy-makers in Tanzania can better identify the areas where they can capture greater value within the national component of the global value chain. National exporters might not easily see how they can translate a trade policy or a national export strategy into concrete strategy help grow their businesses and exports. Thus, the area of greatest interest for producers and exporters will be in national programmes aimed at addressing competitiveness within their respective value chains. Such support is likely to help to achieve a greater 'buy-in'.

One of the major challenges of developing a credible, comprehensive and integrated value chain analysis is the absence of reliable baseline data. Consequently, there is a need to rely on rigorous local research in individual in-depth stakeholders' interviews.² This required a two-step approach: first, the fieldwork; and second, data analysis, benchmarking and report writing.

Sector and crop selection

The selection of sectors and crops was made at the request of the beneficiary agencies based on their priorities, and to avoid duplication of sector studies undertaken by other development partners. The selected subsectors are leading export crops but have experienced, or continue to experience, volatile market and climate conditions, or in some cases declining trends in export quantity and quality over time. They are also characterised by inadequate capacity across different value chain actors to effectively enhance competitiveness. These agricultural subsectors are also important sources of low-skill employment and income generation especially for women and youth.

These sectors were selected based on the following criteria (see table 1):

- Sectors where quality differentiation, value addition, and upgrading are possible and most

¹ See Part I of this report (*'Analysis of bottlenecks affecting agricultural competitiveness and export diversification in Tanzania and proposals for a trade policy framework to enhance agricultural competitiveness'*) developed under this TradeCom II project.

² Intensive one-on-one interviews tend to yield detailed data and information required to develop a representative value chain analysis.

- urgent;
- Sectors with unexploited productivity and export potential;
 - Emerging sectors that can take advantage of with existing comparative advantages;
 - Services sectors that can contribute horizontally to improved competitiveness given the importance of trade in services for selected export corridors; and
 - Detailed review of the performance and competitiveness potential of four major export-oriented sectors.

In addition, the selection placed emphasis on the opportunities for value addition, competitiveness and diversification.

Table 1: Selection of crops and sectors

| Sector/crops/export corridors | Mode of research | Methodology |
|--|---|---|
| Zanzibar-Pemba Export Corridor and other export corridors: <ul style="list-style-type: none"> • Agribusiness and value chain development: seaweed, spices, and cloves • Agricultural trade drivers and inhibitors • Guide to managing agri-product quality • Review of trade policy and strategies | Interviews with key stakeholders and relevant organisations, secondary research, review and evaluation of land, quality, agribusiness, health, and food exports policies, programmes, strategies and initiatives. | Graphics, tables, sector diagnostics, analysis, and value chain analysis. |

The Government agencies responsible for trade and agriculture,³ farmers' groups, private sector producers, processors, marketers, aggregators, services providers, NGOs, and exporter associations were interviewed to identify subsector constraints and also areas of competitive advantage. Interviews were also held with development partners to collect data on the many sector interventions seeking to address different challenges to value chain development and the business environment. For instance, an assessment of the product quality environment was undertaken with the aim of fully understanding the roles of government agencies and institutions in enhancing or undermining quality management along those value chains as well as those agencies that are responsible for SPS/TBT compliance ensuring food safety, plant and animal biosecurity, together with the private sector beneficiaries; agribusinesses, the agricultural production base, and export clusters and associations.

Emerging issues

The stakeholder interviews, literature review of literature and data collection provided a picture of various bottlenecks affecting the respective entire value chain. The TAT examined whether certain challenges cluster heavily along specific sections of the value chain. For instance, issues related to weaknesses in quality infrastructure that delay product standardisation and certification arose repeatedly during the interviews. On this basis, targeted interviews were pursued with the Zanzibar

³ This included agencies responsible for food safety and quality standards and certification, customs and trade facilitation, trade statistics, trade, export and investment promotion agencies, crop boards, public research institutions etc.

Bureau of Standards (ZBS), Tanzania Bureau of Standards (TBS), Tanzania Foods and Drugs Authority (TFDA) and the Office of the Chief Government Chemist to determine the root cause of the institutional hitches identified along the value chain.

Validation process

As a core component of the quality assurance of the programme deliverables, six ‘brown-bag’ seminar series have been held to discuss the programme findings, thereby soliciting feedback and clarification. A final project workshop is to be held in early 2022 to seek views from Tanzania’s trade policy community. The output of these activities also provided material for the EU TradeCom II monthly newsletter series.

AGRICULTURAL COMPETITIVENESS AND EXPORT DIVERSIFICATION ALONG THE ZANZIBAR EXPORT CORRIDOR – VALUE CHAIN ANALYSIS OF SEAWEED

2 SEAWEED

2.1 The global and national context

Seaweed is one of the most important commercial marine living renewable resources. Edible seaweed has traditionally, in some parts of the world, been used as a staple diet thanks to its nutritional and health benefits. Nutritionally, seaweed is used as a bioactive antioxidant and anticancer agent because of its high content in soluble dietary fibres, proteins, minerals, vitamins, phytochemicals and polyunsaturated fatty acids. It also serves as feedstock for biofuels production, therefore reducing dependency on fossil fuels. Seaweed is also used to reduce adipogenesis – the degeneration of healthy cells.⁴

The annual global production of seaweed stands at 25 million metric tonnes – with China and Indonesia accounting for four-fifths of the entire stock – and is worth some US\$6.4 billion (2015). Seaweed production is expanding at about 8% per year in the past decade, up from 6.2% in the previous decade, with output more than doubling in this period (FAO, 2016). On comparative terms, Indonesia is the major contributor to the global growth in seaweed, with annually farmed seaweeds output rising by more than 10 times, from less than a million tonnes in 2005 to 10 million tonnes in 2014, and its share of world farmed seaweed production expanding dramatically from 6.7% in 2005 to 36.9% in 2014 (FAO 2016). Harvests are either from naturally growing (wild) seaweed or from cultivated (farmed) crops. In recent years, farming of seaweed has grown exponentially as demand has outstripped the supply available from natural (wild), stocks which has spurred the growth of cultivation industries that now supply over 90% of the market.

The global commercial seaweeds market was valued at US\$10.31 billion in 2015 and is forecast to reach US\$22.13 billion by 2024 (FAO, 2016). This represents annual growth of 8.9% from 2016 to 2024. China, Japan and South Korea are among the major export markets. The seaweeds market includes food products for human consumption worth about US\$5 billion, extracts from seaweeds (hydrocolloids), which account for a large share of the market, and smaller, miscellaneous uses, such as fertilisers and animal feed additives, which account for the rest of the market. Nearly 40 countries are engaged in commercial harvesting, in waters ranging from cold, through temperate, to tropical.

2.1.1 Seaweed's untapped potential

Industrial and commercial seaweed production began in Zanzibar in 1989, (introduced from the Philippines) but to date its huge potential to stimulate the economic transformation through increased cultivation and export remains untapped. According to the Ministry of Agriculture, Livestock and Natural Resources data from 2016, there are about 25000 seaweed farmers in Zanzibar, 80% of them rural women which presents great potential for the economic empowerment of women as well as providing a pathway towards rural development, poverty reduction in Zanzibar and achieving the SDGs 1, 2, 8, 10, 12. In addition over 150,000 people also benefit indirectly from the seaweed

⁴ Benefits of seaweed farming (2017) – Retrieved 12 July 2017, from <http://www.thecitizen.co.tz/News/national/Benefits-of-seaweed-farming/1840392-2593302-4yqlqaz/index.html>

downstream industry. Annual production volumes currently stand at about 11,000 metric tonnes (Ministry of Agriculture, Livestock and Natural Resources 2016), which represents a decline from 13,000 MT in 2014 and a high of 15,000 MT in 2012. Government plans are to double production to at least 20,000 MT by 2020 (see Figure 3). Until recently, seaweed accounted for 90% of Zanzibar marine product exports representing about 25% of exports, and the third largest contributor to GDP after tourism and cloves. Therefore, its importance cannot be understated. Zanzibar's seaweed industry depends largely on global export markets: China, Denmark, France, Korea, Spain, the USA and Vietnam. There is also a nascent market for seaweed products in the tourism sector.

However, the sustainability of exports is threatened by competition from producers in countries like Indonesia, the Philippines and China who have closer proximity to the lucrative Asian market as well as better resourced marketing infrastructure. Within the value chain, growers complain of low prices from local buyers/exporters. There is high concentration and lack of competition among buyers (oligopsony), with one buyer, C-Weed Corporation, accounting for over half of Zanzibar's exports. The sector's future also faces threats from climate change. However, there is much more to harness from the seaweed downstream value chain towards enhancing competitiveness and diversification, while serving as one of the surest pathways towards rural development, environmental sustainability and poverty reduction in Zanzibar.

2.2 Assessment of the seaweed value chain in Zanzibar

The seaweed supply process in Zanzibar involves many activities that include input supply (ropes, pegs, boats, seedlings), land preparation, planting, harvesting, use of drying methods, cleaning from foreign matters, proper packing, and use of appropriate methods of packing materials, collection, bulking of the harvested seaweed, supplying, wholesaling, retailing for domestic consumption and exporting to overseas markets.

2.2.1 Production

Small-scale seaweed farming is one of the most important socio-economic activities in Zanzibar due to its provision of informal employment opportunities especially to women.⁵ It is mostly grown in Pwani Mchangani, East Coast of Zanzibar and Pemba. Zanzibar produces two types of seaweeds, which are the thin-layered leaves *Eucheuma (spinosum)* and thick-layered leaves *Eucheuma (cottonii)*.⁶ However, *cottonii* fetches higher world market prices than the *spinosum* type.⁷

According to Seif (2013), either a senior female or a male household member manages each seaweed farm and it is estimated that two persons per household are engaged in seaweed farming. Many of the Zanzibar farmers manage between one and five farms. Men owned farms tend to be larger than those owned by women. A typical large, male-owned off-bottom plot consists of 30 lines that are ten metres in length.

Seaweed farming technology includes:

- Deep-water technique (where the farm is kept underwater at all times);

⁵ Seaweed grows best in shallow, calm and constantly warm waters with temperatures of around 25 to 30 Celsius (77–86°F), but temperatures are now rising above 31°C (88°F), which is unfavourable for seaweed growth.

⁶ *Spinosum* is the most commonly grown seaweed type in Zanzibar to the tune of 90% of the production and is resistant to coastal weather and movements of ocean water. While the *cottonii* type is fragile and very sensitive to open exposures, water tides and high temperatures. Both types require six weeks from planting to harvest and grown continuously throughout the year. *Eucheuma cottonii* is grown from April to December, and *Eucheuma spinosum* is cultivated throughout the year.

⁷ Despite its environmental sensitivity, *cottonii* seaweed species has high market value due to its characteristics of producing a strong gel. Planting *cottonii* seaweed in deep waters enables it to tolerate harsh environmental conditions such as temperature fluctuations and strong waves.

- Raft method (floating lines technique);
- Peg and line technique or tie-tie system; and
- Off-bottom technique.

It takes six weeks to harvest the seaweed and two days to dry it. The use of old seedlings and the failure to adopt modern techniques are two of the common challenges that undermines farming productivity on the island.

Whereas competitor producer nations, such as Indonesia and Philippines, produce 92% and 97% of higher-value *cottonii*, respectively, Zanzibar has just over three% of the world market of which 77% of the product is the lower value *spinosum*. Pemba contributes about 70% of Zanzibar's seaweed exports largely because the farmers are able to grow seaweed in deep water where it is cooler, thereby counteracting the effect of climate change. As illustrated in Figure 4 seaweed production has fluctuated with it being relatively high in 2012 and 2015 and a comparatively low production in 2013 and in 2016. The decline in production in 2016 has been partially blamed on climate change impacts such as changes in water temperature, rising sea level, storm intensities, poor governance and environmental degradation of seaweed habitat, diseases such as die-off and epiphytes colonisation, low prices offered by buyers and conflicts between seaweed communities and other sectors, poor postharvest handling, packaging and storage and weak support institutions.

2.2.2 Seaweed farmers' groups

In Zanzibar, and like most farmers' cooperatives in the mainland, seaweed farmers associations and cooperatives have evolved, disappeared and re-emerged over time in every farming village. In order to strengthen the governance of the farmers groups, the Marine and Coastal Environment Management Project, Zanzibar Seaweed Cluster Initiative (see Box 11, below) and Seaweed Centre Zanzibar helped to mobilise farmers in different villages to form groups so as to access technical, financial and other related entrepreneurial support.⁸ As at May 2013, and based on government support, seaweed farmer groups increased from 40 in 2007 to 80 groups in both Unguja and Pemba (Seif, 2013). Export volumes are in decline from 9,635 tonnes in 2012, dropping to 5,440 tonnes in 2016. See the figures below.

⁸ Seaweed Centre Zanzibar is a centre founded by the Chalmers School of Entrepreneurship and the School of Intellectual Capital Management, and aimed at making seaweed women farmers more independent, entrepreneurial, self-sustaining and driven towards socio-economic empowerment. The women at the centre produce and sell soaps to tourists and local hotels as well as to Swedish market. The centre is also a knowledge centre where local people could learn English and access internet. It is also a business centre for seaweed tours for tourists and sales of other locally made clothes. It is expected that the success of the Centre can be replicated in other villages in Zanzibar.

Figure 1: Seaweed production per annum in tonnes

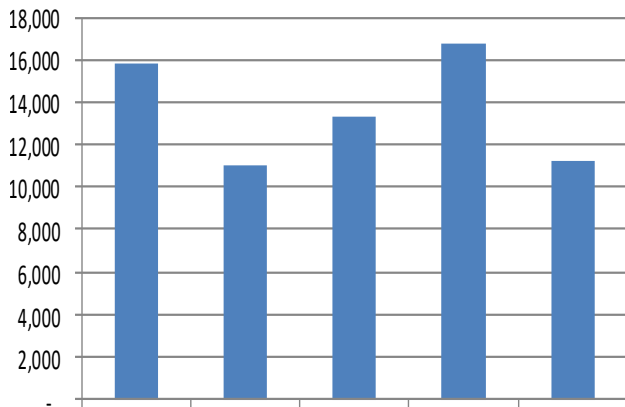
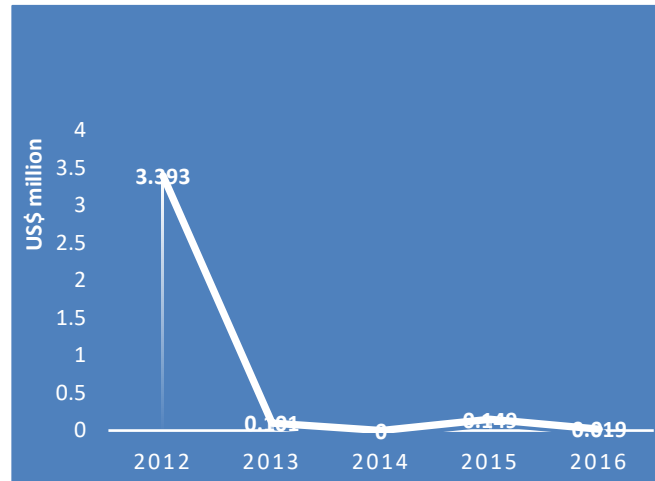


Figure 2: Tanzania's Seaweed Exports 2012–16



Source: Department of Marine Resources, Zanzibar (2017) and https://www.trademap.org/news/trademap_update_trade_indicators_en.html

Box 11. Zanzibar seaweed cluster

ZaSCI is one of the clusters established under the Innovations Systems and Clusters Programme in Tanzania (ISCP-Tz) and is now called the Pan African Competitiveness Forum. It commenced activities in 2006 and is working with seaweed farmers in nine villages in Zanzibar and one village on the mainland. ZaSCI is facilitated by the 'Cluster Facilitator', which is based at the Institute of Marine Sciences of the University of Dar es Salaam, working with seaweed farmers on value addition, as well as adapting farming methods towards combating seaweed die-offs problems. ZaSCI is specifically aimed at addressing the competitiveness challenges along seaweed value chain and harnessing scientific information for the benefit of farmers and the country, focusing on adoption of improved farming techniques and value addition. More importantly, the cluster is a shared set of seaweed competitiveness ideas and relationships that are shared among a set of the relevant value chain actors. Among the 70 cluster programmes that exist in Tanzania, six are based in Zanzibar and its seaweed cluster stands out to be the most successful in Tanzania.

The cluster adapts a triple helix model, a system that brings together government, academia and enterprises. In addition to providing the platform for enhancing the capacities of seaweed primary producers by exposing them to innovative and effective technologies, some of the successes driving the ZaSCI is the cordial relationship between the farmers and scientists towards removing the barriers of superiority attitude and information asymmetry between the cluster actors. Furthermore, until 2008, farmers depended on prices paid by exporting company for a kilo of dry seaweed. In addition, farming process was based on contracts in which the farmers were provided with farming inputs (mainly ropes or pegs) by the seaweed exporting companies and farmers were required to sell the seaweed to the provider of inputs. Thus, farmers had no negotiating power over seaweed prices until 2008 when the first seaweed value-added product was launched under the ZaSCI.

As at 2012, ZaSCI comprises approximately 3000 members in about six villages. One of its groups in Chwaka village, named Tuwe Pamoja (let us be together'), took steps to obtain an export licence from the government and other members were actively looking for overseas export markets. The group also arranges exports through the Dar es Salaam based export company Calmax Exporters, which is also an affiliate of ZaSCI. ZaSCI has a crucial role to play in the industry by strengthening its own capacity to enhance seaweed farmers capacity to form

cooperative so that they can enhance their economic market power. A seaweed farmer cooperative can serve one or more functions including but not limited to providing loans to farmers, supplying information pertinent to agricultural production, selling inputs necessary to agricultural production, bargaining on behalf of its members, providing transportation services, and marketing agricultural products for its members.

2.2.3 Value addition, post harvesting management, and processing

There is huge untapped potential in seaweed value addition during postharvest management and processing. Globally, there are over 100 seaweed by-products, yet Zanzibar produces less than half of them (mainly seaweed shampoo, lotion, liquid soap, coconut oil, caustic soda, essential oil – and still in small quantities).⁹ Postharvest handling is poor, processing capacity is limited, and packaging and storage are done in unclean sheds or by road sides. Seaweed growers harvest/catch the seaweed, dry it and sell it to dealers for a historically low price at around \$0.27 per kg. To facilitate diversification of seaweed production, the Zanzibar Ministry of Trade, Industries and Marketing (ZMTIM) and MANRLF, in partnership with the private sector, need to provide a platform for the creation of more value-added products such as seaweed powder to make soaps, body oils and shampoos. For example, there is a seaweed centre in Paje, a small village on the south-eastern coast of Unguja, where ZaSCI are adding value by producing soaps, body scrubs and skin care products, which they market and sell to hotels.¹⁰

2.2.4 Product quality

The price paid to farmers is dependent on quality yet there is no structured postharvest quality control system in place. After harvesting, much still needs to be achieved along the seaweed value chain downstream activities before the seaweed final products get to the consumer. Seaweed is dried to 35% moisture (determination is by feel) and 2% impurities (i.e. sand, stones and salt). Storage of the product is in the houses of the producers before sale and later in exporter stores. Some 70% of the product is from Pemba and containerised on Unguja island. For the product destined to carrageenan processing,¹¹ the viscosity of the product is important in determining price; the higher the viscosity, the better the price. The end-user determines the price and there is no testing for viscosity prior to dispatch by the exporters. However, quality drops when farmers see more buyers looking for product and some will add sand and fresh seaweed in the lots to add weight and therefore try to get more money. There is very little loyalty between producer and buyer. To facilitate fair process of quality control, government should provide processing centres where farmers can dry their seaweed and chop it into pieces, rather than exporting the raw seaweed to other countries.

2.2.5 Marketing and retailing

Marketing and retailing of seaweed products for domestic and export markets is respectively dominated by individual women and private foreign companies operating in the Zanzibar-Pemba Export Corridor. Women rely on informal community relations between farmers, aggregators and buyers but access to finance credit facilities is their main challenge. With the increasing number of value-added seaweed products, there is a rise in the number of mini-stores and other retailing outlets

⁹ Dry seaweed, seaweed bar soap including with cinnamon, lemon grass and lime, Seaweed desserts (Cold process products, Maha Blanca, Gulaman, *Halua ya mwani*), seaweed body creams (seaweed only, seaweed with lemon grass, seaweed with cinnamon), seaweed puddings with fruit chops, seaweed gels and with fruit concentrate.

¹⁰ The seaweed soap comes in a variety of flavours from cloves, coffee, lemongrass and eucalyptus, all with pure essential oil, and/or fresh powder, no perfume.

¹¹ Several ongoing seaweed value-added initiatives include efforts especially in the medical experiments to extract the gel carrageenan by University of Dar es Salaam, Sokoine University of Agriculture and the Tanzania Industrial Research Development Organisation.

with diverse types of processed seaweed products. However, domestic retailing is undermined by limited product standardisation and quality certification.

On the other hand, private seaweed companies¹² operating in Zanzibar employ thousands of people engaged in the farming of red algae, and downstream value chain activities such as rope making, cockling and shell gathering. Each exporting company operates a buying office in the farming villages and employs a local villager as a buying officer to buy seaweed during peak harvesting seasons. The companies buy and store seaweed in the village until sufficient quantities accumulate to make a truck trip to Zanzibar Town and onward to its multinational sister companies abroad.

2.2.6 Exporting

The export markets for Zanzibar exporter is monopolised by a few international buyers who export to their mother companies in the United States of America, France, Denmark, and Spain for processing. Some of the privately owned seaweed companies operate in Zanzibar and employ thousands of people with farming of red algae.¹³ This includes downstream value chain activities such as rope making, cockling and shell gathering. Each exporting company operates a buying office in the farming villages, employs a local villager as a buying officer to buy seaweed during peak harvesting seasons. The companies buy and store seaweed in the village until sufficient quantities accumulate to make a truck trip to Zanzibar Town and onward to its multinational sister companies abroad (Msuya, 2012).

The seaweed growers sell their crop as individuals through commission agents. Although associations and clusters exist there are no group sales. The seaweed growers produce on average between 15 to over 20 tonnes per annum providing a reasonable income for farmers (€5,600 per annum for a limited outlay).

Processed products include: soaps, body cream, juices, jams and cakes. Powder is also produced locally. Seaweed jam has been sold in exhibitions in Uganda and Burundi.

The huge decline in seaweed prices in the export market in recent years has attributed to monopolistic behaviour, and the surge in seaweed supply from Indonesia and China has had a devastating impact on the sector. For example, the price of *spinosum* seaweed was previously around TZS700 (US\$0.31/€0.28) per kg (2.2 pounds), but is now less than half, selling for TZS300. The price for *cottonii*, another type, has tumbled from around TZS1,100 to TZS700. Economic rent due to farmers has been eroded as average price of seaweed has been declining for many years (around TZS300–400/kg). However, with value addition, seaweed products can be sold at up to TZS10,000/kg, which would constitute a 2,400-percentage increase. It is estimated that a farmer gets about 0.26% of world price (COSTECH, 2015)¹⁴ – to get more income from seaweed products there is a need to increase value addition to about 50% by 2020. For example, average price of seaweed powder is US\$4.50 per kg, but local female entrepreneurs that process seaweed powder into seaweed soap can sell the product for TZS30,000 (US\$13.3) per kg.

¹² As at August 2017, the private exporting companies include: Kai Trading, SM Rashid, C-Weed Company, Zanque Aqua Farms, Zanzibar Agro-Seaweeds Company Ltd (ZASCOL), Zanzibar East Africa Seaweed Company (ZANEA) and Zanzibar Shell. The three biggest buyers in decreasing order are C-Weed, ZANEA and ZanQue/ZaSCOL

¹³ As at 2010, the private exporting companies include: Kai Trading, SM Rashid, C-Weed Company, Birr Sea-Weed Company, Zanque Aqua Farms, Zanzibar Agro-Seaweeds Company Ltd (ZASCOL), Zanzibar East Africa Seaweed Company (ZANEA) and Zanzibar Shell.

¹⁴ COSTECH. (2015). Zanzibar Research Agenda 2015–20. Available at <http://www.costech.or.tz/wp-content/uploads/2015/03/Zanzibar-research-agenda1.pdf>

Box 12. Value addition and diversification are the most appropriate responses to declining seaweed exports prices

Dried seaweed can be stored for six months under good storage conditions and good packaging. The seaweed growers sell their crop as individuals through commission agents. Although associations and clusters exist there are no group sales. The market prices are determined by the Indonesian and Philippine seaweed industry. In recent years the prices for dry seaweed have been depressed from TZS700 (US\$0.3) to TZS400 (US\$0.17) per kg. With value addition the prices rise; for example, for seaweed powder at US\$4.50/kg, local female entrepreneurs that process seaweed soap can sell the product for TZS30,000 (US\$13.3) per kg.

Processed products include soaps, body cream, juices, jams and cakes; powder is also produced locally. Seaweed jam has been sold in exhibitions in Uganda and Burundi. Unfortunately, most of the processed seaweed products are not exported to the EU or other developed markets because ZaSCI is still processing the certification and standardisation of the products with Zanzibar Bureau of Standards (ZBS) and Zanzibar Food and Drug Agency (ZFDB). A further export permit is yet to be processed. ZaSCI hopes its members will commence exporting to EU markets this year (2018).

2.2.7 Export procedures

Procedures for exporting spices are cumbersome and costly. National export procedures require that all seaweed be compacted into bales and containerised in 12 metre dry containers each holding 45 tonnes. Packing the container is done at the exporter’s store in the presence of police and customs officials to ensure no smuggling/fraudulent activity is undertaken. The exporter is charged for the monitor’s time at US\$20 per hour. Other costs include weighing at the port (US\$100) and transport to the port (US\$104). The Zanzibar Bureau of Standards (ZBS) carries out testing and certification using the certification systems management process International Standards Organisation (ISO) 17065 and the inspection process under ISO 17020. Charges include application fee TZS10,000 and inspection TZS50,000, annual certification costs TZS100,000 plus testing and inspector costs and subsistence; two licence extensions at TZS50,000 each and two testing fees. A phytosanitary certificate (that costs TZS10,000) must accompany each consignment but some countries in the EU do not recognise certificates issued in mainland Tanzania. And only China recognises a phytosanitary certificate that is issued on the mainland. The ZBS has no laboratory, and only very few ZaSCI members have been able to certify their products with both ZBS and ZFDB.

Table 2: Dried seaweed exports

| Crop | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | |
|---------|--------|-------------------------------|--------|-----------------------|--------|-----------------------|--------|-----------------------|--------|-----------------------|
| | Tonnes | Value TZS million (million €) | Tonnes | Value TZS million (€) | Tonnes | Value TZS million (€) | Tonnes | Value TZS million (€) | Tonnes | Value TZS million (€) |
| Seaweed | 9,635 | 5,151 (2.5 million) | 9,241 | 6,828 (3.2 million) | 13,806 | 8,471 (3.9 million) | 8,073 | 5,863 (2.4 million) | 5,440 | 3,803 (1.5 million) |

Source: Tanzania Revenue Authority (2017)

2.2.8 Gender

Seaweed farming has empowered women in Zanzibar as becoming breadwinners. Though a few men could be sceptical about this development, husbands and children largely assist their wives in such activities, as harvesting large amounts of seaweed from the farms to the drying centres and finally to

the point of sale. In addition, children also provide support in tying branches to lines at home. Due to the nature of seaweed farming as a joint family activity, women find it more convenient as a family business. However, in Pemba island, the sister Island of Unguja, many men still farm seaweed probably because of lack of alternatives on that island compared to Unguja, and the fact that Pemba people are often described as more diligent than their Unguja counterparts (Msuya, 2011 – World Aquaculture, September 2011).

2.3 Seaweed policy framework

Up until the 1980s, a centralised, top-down approach to economic policymaking and coastal resources management was followed in Zanzibar across all its districts. It is not unexpected that as the economy becomes more liberalised and the subsector evolves, the extent of competitiveness issues that were targeted with specific policies also grew from the broad development policies, down to the specific regulations on production, processing, exports, and inputs from the central governments as well as bottom-up through participation at the district levels. In addition, the most important legal documents relating to the management of the seaweed subsector can be grouped as policies directed towards the following:

- State and private management of seaweed;
- Fisheries (and seaweed) development strategies;
- Exploitation and protection of aquatic resources;
- Environmental management and control of aquatic diseases;
- Quality, safety and veterinary control of aquatic products; and
- Standards and requirements for running a seaweed agribusiness.

Interviews with the district-level policymakers and value chain actors in the field suggest that while development strategies exist within the fisheries development policy, specific mechanisms and concrete actions for implementation and progress are weak, thereby, making the policy environment inimical to seaweed competitiveness and diversification.

2.3.1 National policies and laws

Zanzibar seems to have no specific legislation on seaweed at the national or state levels, but such legislation is under development. In spite of this legislative gap, the SMZ has been very active in the transformation of the seaweed industry within its fisheries and aquaculture development strategies and programmes. The Government of Zanzibar is promoting agro-industrialisation and has declared seaweed as one of the priority crops on its pathway to realising the Vision 2020. Provision of the appropriate policy incentives and enabling business tools for value chain actors, especially towards enhancing the competitiveness of farmers, processors and exporters is one of the objectives. Government contributions and institutions towards seaweed research and policy activities continue to reflect government commitment to the transformation of the industry. However, seaweed being a major coastal resource in Zanzibar, the seaweed farmers rely on it for their livelihoods, although other activities such as artisanal fishing, lime and salt production, and related tourism activities also affect livelihoods. Due to the intensive exploitation of coastal and marine resources over time, there is increasing need for sustainable use of coastal resources towards improving economic well-being and poverty alleviation. In view of this, and over the years, there exists relevant coastal and marine

resources management policies, legislation and regulations that are applicable to the seaweed industry in Zanzibar.¹⁵

One of the most recent and relevant policies is the Revolutionary Government of Zanzibar Fisheries Policy (see the Box 13 below). One of the objectives of the Fisheries Policy is to promote the development of sustainable aquaculture and seaweed in Zanzibar towards contributing to socio-economic development of the coastal population.

Box 13. Revolutionary Government of Zanzibar Fisheries Policy

Seaweed farming is one of the most significant income-generating mariculture activities for women living in the coastal communities of Zanzibar. As at 2010, number of seaweed farmers was 21,970 (Zanzibar Fisheries Policy, 2015). In 2012, the sector exported 14,400 tonnes (dried weight) and about US\$3.6 million worth of seaweed.

The current seaweed policy strategy is articulated within the larger fisheries policy strategy. It places emphases on value addition and provides the implementation institutions to achieve this vision.

Issue: There is a need to improve value addition for seaweed farming at producer level so as to boost existing production and to create an enabling environment to support development initiatives of private entrepreneurs in other mariculture activities.

Policy statement: The government will play a catalytic role in the development of sustainable private sector-led growth aquaculture in Zanzibar through further developing seaweed farming with focus on value addition activities and promoting the formulation and implementation of a Zanzibar Aquaculture Strategic Plan paying particular attention to commercial aquaculture and public-private partnership in accordance to MKUZA II.

Implementation strategy: Improve value addition in seaweed farming through increasing the capacity of farmers in price negotiation (awareness-raising, training, market information system), promoting the establishment of semi-industrial processing units in Zanzibar in close collaboration with private investors (possibly) through promoting financial incentives) and improving formalisation and enhanced regulation of seaweed trade activities.

Ensure that seaweed farming development aligns with environmental objectives in coastal zones through the development of local coastal management plans for seaweed farming including zoning measures (e.g. no seaweed zones) in close collaboration with existing Village Seaweed Fishing Committees.

Implementation Strategies and Main Partner Institutions:

- Improve value addition in seaweed farming – Local Governments, academic research, ZBS, ZMTIM, Chamber of Commerce, OCGS, private actors, ZASEFA, SVFCs, non-governmental organisations (NGOs);
- Ensure seaweed farming is environmentally friendly – Local government, police, academic research, Ministry of Environment, Ministry of Forestry, ZASEFA, SVFCs, NGOs.

2.3.2 International policies and conventions

At the global level, the South-West Indian Ocean Fisheries Governance and Shared Growth Programme (SWIOFish) includes Comoros, Madagascar, Mauritius, Mozambique, Tanzania and Seychelles. In Tanzania, SWIOFish focuses on tuna, prawns, small pelagics, octopus, reef fisheries and mariculture, such as seaweed. It seeks to build the economic importance of these subsectors to local employment. The SWIOFish project is a follow-up to its predecessor, the Marine and Coastal

¹⁵ Some of these national policies include: Fisheries Policy (1985), National Environmental Policy for Zanzibar (1992), Fisheries Act (1988) and Regulations (1993), Environmental Management for Sustainable Development Act (1996), and Regulations, Establishment of Zanzibar Nature Conservation Areas Management Unit Act (1999), Land Tenure Act (1992) and Land Tenure (Amendment) Act 2003, Zanzibar Tourism Policy (2004), Territorial Sea and Exclusive Economic Zone Act (1989), Deep Sea Fishing Authority Act (1998). While complementing the National Integrated Coastal Environment.

Environment Management Project, which covered 147 communities and included a wide range of activities.

2.4 Challenges affecting competitiveness of the seaweed subsector

Like any rapidly growing agricultural subsector, seaweed economy faces many challenges, chief among them being weak poor governance, and environmental degradation of seaweed habitat. The challenges include:

- Gaps in seaweed policy environment and regulatory framework continue to undermine the competitiveness, growth and sustainable development of the subsector. Stakeholders lament that while development strategies exist within the fisheries development policy, specific mechanisms, concrete actions and resources for implementation and progress are either weak or absent. In addition, there is weak macroeconomic support and regulatory institutions to enforce quality standards. Less supportive business environment, multiple levies and taxation, complicated logistics and weak trade support institutions further exacerbate the situation. In addition, making informed policy decisions for the development of seaweed production is undermined by serious gaps that exist in official statistics.
- Competitiveness of the seaweed subsector is also hampered by weak business linkages among value chain actors including farmers, processors, traders, exporters and ineffective marketing systems. Direct business networks – especially with exports market and market information service systems customised to meet the different needs of the value chain actors – are inadequate.
- Recently problems have emerged in the areas where seaweed farming originally started, including diseases such as die-off and epiphytes growing on the seaweed. Other problems are skin itching among the seaweed farmers, low prices offered by buyers and conflicts between seaweed communities and other sectors. It is targeted to increase production from 15,087 tonnes in 2012 to 20,000 tonnes by 2020 through improved farm management practices and alternative farming methods. Examples of research topics in this area would be die-off of seaweed, impact of climate change on seaweed growth, epiphyte infestations, new seeds as well as marketing and innovation.
- As the third most productive sector after tourism and cloves, changing climatic and market factors are increasing affecting the buoyancy of the industry. Some of the environmental factors include rise in seawater temperatures, epiphytism (see Mmochi et al. 2005, Msuya 2007, Msuya 2012).
- Currently, postharvest handling is poor, packaging and storage are poorly done in unclean sheds or by roadsides.
- Other challenges include stealing of seaweed during cultivation and drying season, the loss of seaweed in water during cutting, the presence of seaweed disease such as fungus and fungal diseases, conflict between seaweed cultivators and other marine space users (e.g. fishermen and tourism investors), the lack of basic farm inputs to enhance the production of seaweed, and the lack of knowledge on the competitive price of seaweed in the global market.

Table 3: NTMs-related obstacles: Zanzibar seaweed exports by partner countries

| NTMs applied by Zanzibar | NTMs applied by partner countries | Procedural obstacles encountered by exporters | Procedural obstacles encountered by importers |
|--|---|--|--|
| <ul style="list-style-type: none"> • Certification required by the exporting countries. • Licensing or permit to export. • Export registration. • Other export quantitative restrictions. • Export taxes and charges. • Measures on re-export. • Other export related measures. | <ul style="list-style-type: none"> • Technical requirements. • Conformity assessment • Pre-shipment inspection • Charges, taxes. • Microbiological criteria. • Product registration. • Special authorisation because of food. • Labelling. • Packaging. • Quantity control measures. • Price control measures. • Trade-related investment measures. • Anti-competitive measures. • Subsidies. • Distribution restriction. • Rules and related certificate of origin. • Finance measures. | <ul style="list-style-type: none"> • Administrative burdens related to regulation. • Information/transparency issues. • Discriminatory behaviour of officials. • Time constraints. • Informal or unusually high payment. • Lack of seaweed-specific facilities. • Lack of recognition/accreditation. • Other | <ul style="list-style-type: none"> • Administrative burdens related to regulation. • Information/transparency issues. • Discriminatory behaviour of officials. • Time constraints. • Informal or unusually high payment. • Lack of seaweed-specific facilities. • Lack of recognition/accreditation. • Other |

| NTMs applied by Zanzibar | NTMs applied by partner countries | Procedural obstacles encountered by exporters | Procedural obstacles encountered by importers |
|--------------------------|--|---|---|
| | <ul style="list-style-type: none"> • Intellectual property. • Other import related measures. | | |

2.5 Recommendations to enhance seaweed competitiveness

The analysis has revealed that the several hurdles facing the seaweed subsector include: (i) weak production and trade capacity; (ii) unsustainable production methods; (iii) decline in seaweed production and prices; (iv) policy gaps; and (v) weak capacity to meet product quality requirements for export market. As one of the mariculture products with huge growth potential supported by sustained growth in global demand, Tanzania needs to re-direct more efforts towards implementing quick-win strategies (production and trade policy strategies) to reverse the current downward trend in seaweed exports and maximise opportunities in the subsector. To reverse the downward trends, the following recommendations are made:

1. As a starting point, a separate seaweed development policy framework is required with specific mechanisms, concrete actions and resources for implementation. Based on the framework, there should be developed and implemented a comprehensive implementation and capacity-building strategy geared to build the production and trade capacity of seaweed value chain actors towards enhancing their competitiveness, diversification, standards compliance and value chain upgrading. The strategy should include clear actions, time frames, deliverables, outputs and outcomes. In this regard the capacity building should, inter alia, focus on:
 - Targeted client or stakeholder-based and customised trainings to respond to the specific challenges of farmers groups, producers, processors, marketers, retailers and exporters;
 - Training and transferring knowledge to farmers regarding farm management practices, expanding output, disease prevention, and securing independent credit access;
 - The establishment of a quality and productivity policy programme to provide support to ZMTIM on the enforcement and analysis of standards compliance and quality issues along the seaweed value chain for the seaweed players to meet export market standards;
 - Providing market information service systems customised to meet the different needs of the value chain actors, to enable them to directly access international markets, especially in Europe. There is a need to prepare and disseminate training manuals/posters, specifically tailored to seaweed farmers;
 - Vocational education and extension services for farmers and primary producers, especially a special empowerment package for women seaweed farmers to be conducted at local level to provide opportunities for on the job training.
2. Developing a seaweed agricultural trade policy. This should comprise three key components:
 - Boosting seaweed production by introducing modern and efficient technologies, seedlings,

research and farm management procedures.¹⁶

- Improving processing capabilities, which will result in structural transformation. Competitiveness of the seaweed value chain depends largely on the ability of seaweed enterprises to accumulate technological, managerial and market capabilities in a rapidly changing global seaweed marketplace. In other words, the seaweed value chain actors need to learn how to respond proactively and preparedly to demand and markets dictates (and hence how to produce, process and export).
 - To make the implementation of these capacity-based trade policies effective and impactful, there is a need for a mix of market forces and public sector support, by addressing supply-side constraints, institutional bottlenecks, infrastructural deficiencies, and other NTM.
3. Promoting the blue economy. This should be implemented within the national blue economy strategy aimed at sustainably harnessing the productive capacity of oceans for economic transformation, food security and poverty alleviation. Central to an effective blue economy programme lies the expansion of seaweed processing subsectors to increase the value of its exports, being the second largest industry in the Zanzibar-Pemba corridor. Transforming raw seaweed into value-added products (e.g. carrageenan) holds potential for attracting private investment while creating scaling-up opportunities for the rural women smallholder farmers that supply nearly all (90%) of Tanzania's seaweed. However, there is huge challenge unsupportive agribusiness environment, which does not allow farmers to intensify the production activities in response to the rapid growth in global market for seaweed.
 4. Targeted investment in the seaweed supply via PPP. Trade policies should be thoughtfully evaluated and re-articulated towards outcome-oriented investments along the entire value chain of the seafood industry, focusing on facilitating access to capital, provision of training to farmers and processors, improved technology and its transfer among farmers and processors for enhancing the production of seaweed, enhanced market strategies for accessing regional and international markets with specific reference to the European market.
 5. Trade policy should also be fashioned to provide an enabling business environment and governance reforms that foster efficiency and further technological innovations in seaweeds genetics and breeding, disease/pests control, postharvest management, product processing, distribution and marketing. A business aimed at connecting small farmers to consumers and the market through a business-to-business e-commerce platform geared to the agricultural sector that allows farmers to advertise their products, negotiating and distributing agricultural products.
 6. Sustainable seaweed management.

To create a profitable seaweed sector by providing access to new seaweed techniques and developed infrastructure and systems to boost investment for local value added to seaweed products. There is a need for the establishment of new policies and regulatory frameworks for seaweed subsector growth.

Some solutions are beyond the reach of the farmers. These solutions include the demand drivers in the international markets, hard and soft infrastructure at the domestic level, capacities of local marketing firms, regulatory framework to mitigate conflicts in land use between seaweed farming and

¹⁶The quality of products and services offered by an agro-enterprise reflects the set of capabilities that its value chain actors possess. In this context, capabilities comprise the tacit knowledge (value chain actors' abilities, knowledge on agro-inputs, equipment, and skilled actors, management and markets; agro-enterprise level know-how, as well as working and organisational practice).

tourism, and provision of favourable business environment. There is need for more extension facilities to be deployed for efficient and sustainable cultivation practices.

Overcoming market access challenges may require a strong farmers' association to improve farmers bargaining power which has been an uphill task among the farmers over the years. While prioritising women small-scale seaweed farming, it is imperative to strategically enlarge ZaSCI towards adopting a multi-stakeholder involvement approach where the roles, contributions and positions of women relative to other players in the value chain do not deteriorate. There is a need for more collaborative efforts to add value to seaweed produce and enhance the capacities of the primary seaweed process to access domestic, regional and international markets, especially in Europe.

The current availability of gender-related data on seaweed is inadequate. In response to this, there is need to address the gaps in gender-disaggregated data.

In recent times, and with the role of Seaweed Cluster Initiative, seaweed subsector is increasingly becoming a lucrative agribusiness venture as the private sector drives and plays a crucial role in the expansion of the industry. However, for seaweed to fulfil its developmental objective in Zanzibar, the public sector also has a strategic role to play in creating an enabling environment for the private sector engagement. This includes development of a favourable business climate, pro-poor regulations (to curtail different forms of environmental degradation, discrimination and inequalities) and functional institutions in place for markets to work efficiently. For example, social and gender specific seaweed programme that focuses on women's economic empowerment. However, accurate information on the production of seaweeds and its downstream value chain activities is difficult to obtain partly due to failure of governments to collect accurate data, lack of interaction between government and industry, commercial secrecy, etc.

Furthermore, developing and ensuring a successful and sustainable seaweed industry is an imperative agenda for the Zanzibar economy. Based on its unique nature, need to establish a seaweed programme with key donors and stakeholders to engage the European Union in improving environmental sustainability, human well-being and economic performance along the seaweed value chain, with a focus on the welfare of the poor in seaweed farming communities in Zanzibar. The programme will be driven by the mission to foster and facilitate the contribution of seaweed to poverty alleviation, sustainable economic growth and economic opportunities for women. In addition to implementing good governance systems in the subsector, it will provide seaweed information, knowledge products and expertise to help ensure sustainability.

3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

Tanzania had been one of the leading global exporters of seaweed since the 1980s. However, post-independence policy mis-steps, subsequent market liberalization without accompanying supporting measures coupled with changes in the global market and commodity prices had resulted in significant decline in output for several traditional exports and loss of market share. The selected value chains have not responded competitively to global production and market changes characterized by lowering of the costs of ICTs, fragmentation of production, trade liberalization and erosion of trade preferences, increasing concentration of lead firms (buyers and traders) in the end markets, and increasing mechanization and use of inputs (improved varieties and fertilizers) to increase productivity, increased incidence of non-tariff barriers, the growing importance of standards and food safety (SPS and TBT issues) especially in seaweed and the corresponding need for quality infrastructure and related

regulations. With appropriate policy interventions, the seaweed sub sector can exhibit significant comparative advantage and potential for export and value chain upgrading.

Further, the seaweed export corridor in Zanzibar exhibits some similar bottlenecks but also some that where specific to certain corridors. For example, cross-cutting issues which largely impact the production segment of the value chain include poor quality infrastructure, a weak enabling environment, burdensome regulations and taxes, poor quality extension services, limited access to finance, subsistence agriculture with low mechanization, low adoption of technology and good agricultural practices, limited use of inputs leading to low productivity, weak supporting institutions with limited resources like local government authorities and crop research institutions etc. On the other hand, region specific bottlenecks include issues such as access to land, remains an acute problem. Other issues such as climate change were both cross-cutting and region-specific, with Zanzibar in particular feeling the acute effects of climate change (especially warmer temperatures, lower rainfall, pests and diseases). Some bottlenecks directly affected specific crops in specific districts such as governance of cooperative societies. Some bottlenecks, especially on the downstream side, involved complicated issues to do with the governance of the global value chain of a product. For example, seaweed has also been found to have a high concentration and vertical integration creating an oligopsony of traders and roasters. These relationships create rent-seeking middle men, and lead to lower prices for producers.

There is no shortage of agricultural, fisheries, and now blue economy sector policies in Zanzibar seeking to promote value chain development and competitiveness. However, the key challenge is poor and ineffective policy implementation, as well as policy inconsistency and sometimes the Revolutionary Government of Zanzibar has retreated from fully supporting the seaweed sector. Most of the recommendations to enhance agricultural competitiveness had been discussed in recent forums but there has been limited action on the ground, for example, the strengthening of extension services, support for irrigation, the neglect of agriculture research institutions etc. The issue of piecemeal / stop-start reforms in agriculture by the state was impeding efforts to adopt a coherent and broad-based approach to enhancing competitiveness. As such, several promising sub-sector initiatives that had been adopted with donor support came to an end once donor funding had ran out.

The role of quality infrastructure (QI) for agricultural exports is of paramount importance. QI in Tanzania (both mainland and Zanzibar) is weak which is exacerbated by regulatory and institutional weaknesses. Many small holder farmers lack capacity and resources to comply with QI issues such as standards, food safety and certification. This resulted in loss of market and export opportunities. Among the other constraints, in Zanzibar, for example, testing capacity is limited to microbiology, some food and water chemistry tests, product physical parameters and limited aflatoxin testing. There is currently no capacity for testing pesticide quality and residue or for food adulterants and contaminants – which are the key challenges for export products such as spices.

Farmer groups are an important part of an ecosystem to value chain development and competitiveness. However, poor governance of farmers/growers (cooperative societies and unions) is a major bottleneck in the production segment of the seaweed value chain. Since liberalization of the economy in the 1990s, agriculture cooperatives have been plagued by governance challenges and inefficient cooperatives have been unable to effectively address the demands facing farmers in today's market driven agricultural value chains. On the other hand, effective agricultural cooperatives enabled farmers to realize economic benefits that they could not otherwise achieve alone. Groups of agricultural producers improve their bargaining power in the marketplace, reduce costs by pooling capital and resources through cooperative enterprises, and make expensive services cheaper, enable farmers to improve product and service quality and reduce risks. Best performing farmers groups (like

MUVIKIHO and TAHA) exhibit certain characteristics and only exist to cater for high yield horticultural sector. They tend to be commercially oriented with proper accounting and transparency. Some have registered as private companies, some have recruited dedicated business managers and agronomists to manage the cooperative, formed business partnerships with buyers and commercial farms, as well as NGOs to support them in finding export markets, training on GAP for members and obtain certification in areas like organic agriculture.

Related to the theme of inclusiveness and diversification, the research found that women and youth were highly under-represented in some of the sub-sectors under examination. In sub-sectors like seaweed, where women constitute the majority of growers, their participation was focused on low value activities.

3.2 Recommendations

To address the above constraints and enhance competitiveness in the seaweed value chain, several policy recommendations which build on lessons from previous and on-going agriculture value chain initiatives are made;

1. It is important to focus on implementation of existing policies and sub-sector strategies which already contain a wealth of initiatives targeting improved competitiveness and productivity. Improving implementation entails better utilization and allocation of resources. It also calls for improved coordination and capacity between all stakeholders, including central and local government and farmers.
2. There is a need for a modest approach, avoiding over-ambitious targets, that are unmatched by resources.
3. There is need to focus on achievable policy recommendations that provide synergy with existing initiatives by inter alia: (i) emphasis on implementation of existing policies and strategies; (ii) emphasis on addressing supply-side issues and strengthening the production segment of the value chain by drastically improving productivity through increased mechanization, adoption of good agricultural practices, development and use of high-yield and climate resilient seed varieties; (iii) facilitating greater adoption of out-grower/contract-farming schemes, which have been successful in developing competitive exports for crops like avocado and specialty coffee, with emphasis on quality and product certification; (iv) adopting a multi-year programme to strengthen national quality infrastructure covering institutions, product standards, infrastructure such as laboratories and other testing facilities and accreditation; (v) establishing a compact to facilitate the private sector as the driver of the agricultural sector; (vi) improve marketing, transport and logistics infrastructure along key corridors, including, pack sheds, cold chain, storage and warehousing and so on. In addition to the value chain recommendations, the programme proposed trade policy measures to reduce trade costs and promote international competitiveness and export diversification. These measures include: (i) emphasis on addressing trade barriers that impede market access (especially to regional trade), including, regulations that raise the costs for imported inputs; (ii) reform and simplify marketing arrangements for certain export crops like cloves and coffee to improve prices for producers and so on.
4. Adopt a commercial approach to seaweed farming. There is need for a more commercial approach to seaweed farming to develop the value chain, improve competitiveness and boost exports. A major take away from the field research is that seaweed can learn from other value chains that have done well which have undergone a shift in approach, moving away from over reliance on government support, towards greater reliance on a mix of private sector and support from development partners.

5. Improving quality standards for competitiveness. A robust National Quality Infrastructure (QI) is critical to ensure aquaculture production, aqua-processing, intermediary and final goods and services conform to specified quality standards, in order to access markets like the EU and also to protect consumers.
 - The QI requires on-going reforms to strengthen missing links, address overlapping and unnecessary institutional duplication, improving streamlining of documentation and standards.
 - QI and standards challenges could be addressed with appropriate multi-year interventions that target all stakeholders in the QI ecosystem.
 - For sustainability, the role of value chain lead firms and cooperative societies (where present) is critical to ensure on-going compliance with industry and market standards.
 - To support smallholder seaweed farmers to meet standards and certification issues it is critical to organize them under effective cooperatives or under a viable out-grower scheme where a commercial farm or lead firm provided support with compliance with standards.
 - The roles of QI agencies need to be streamlined and setting up a one-stop shop or single national window for QI and other licensing and certification issues where exporters could obtain all their QI related certification documents is ideal.

Collaboration and synergies between the ZBS, TBS and other testing agencies needed to improve in order to cut unnecessary costs and duplication.

- Government should commit more resources for the development of QI, training of personnel and purchase of laboratory equipment. This includes improving capacity for organic certification and testing which remains a key concern for seaweed which needs to target both volume increases as well as value addition in premium markets for organic and specialty products.
 - To enhance awareness and capacity to comply with quality standards among local producers, emphasis should be placed on addressing quality issues across trade and agriculture legislation and policies, targeting training for seaweed producers (especially smallholder farmers and processors) on quality issues and standards compliance, and strengthening of SPS enquiry points in the trade ministry.
6. Improving governance of farmers/growers' associations and apex bodies in export and value chain development.
 - Support the formation of best performing autonomously managed farmers group, with minimal government interference and dependency that are structured as profit-making business units.
 - Government should support business to business linkages and provide support to AMCOS through co-operative education and training to improve business acumen and governance. Challenges facing farmers groups must be addressed together with those facing crop boards, marketing systems, LGAs, extension services, agriculture research institutions and SACCOS – as they all impact the production and marketing segments of the value chain.

7. The private sector should be at the heart of any competitiveness reforms together with strengthened and better organized agricultural cooperative societies to ensure sustainability of subsector initiatives.
8. Initiatives to improve value chain competitiveness must incorporate women and youth, including graduates from agricultural training colleges. Address the bottlenecks that impede women and youth from engaging in agriculture such as lack of access to land, lack of access to finance and training, etc.

3.3 Strategies for implementing the recommendations

The proposed recommendation should be supported with an implementation strategy comprising four components:

- Action plan to implement the interventions;
- Financing strategy to mobilise the necessary funds to catalyse the implementation;
- Communication strategy to raise awareness and disseminate information; and
- Monitoring and evaluation framework to track process, demonstrate results and ensure effective implementation.

Table 4: Main interventions — pillars and areas of joint implementation by stakeholders

| Pillar | Specific intervention areas | Relevant SDGs 2030, Zanzibar's Vision 2050, and Tanzania's FYDP III | Private Sector role (domestic) | Role of donors (aid, loans, DFIs, FDIs) |
|--|---|---|--|---|
| Capacity Building for Policy Development and Agric-Investment Ecosystem Reform | <p>Establishment of agri-farms and greenhouses</p> <p>Construction and Upgrading of the agri-processing firms, factories and plants.</p> <p>Upgrading and modernizing technology and equipment.</p> | Agro-processing - value addition to selected crops | Improved leading opportunities from banks and other institutional investors to finance the investments | FDI for transfer of technologies on large agri-farm development and agribusiness analytics. Imports of modern inputs and technologies from donor countries. |
| | <p>Development productive capacity focusing on value addition and beneficiation</p> <p>Effective standards, grading systems, quality assurance and control</p> | Specific crops value chain | <p>Improved bank lending to SMEs and MSMEs (e.g. through less rigorous collateral requirements).</p> <p>Access to finance from capital</p> | <p>Grant aid</p> <p>Technical assistance (TA) from donors</p> <p>FDI in productive and</p> |

| | | | | |
|----------------------------|--|--|---|---|
| | | | market and venture capital firms Institutional investors like insurance companies | processing capacities. |
| | Agri-investment promotion and incentives | All selected agricultural value chain | Lisa with large potential investors | Grant aid (e.g., Invest Africa) TA from donors. |
| | Training and skills development to meet the demands of the priority agro-enterprises | All selected agricultural value chain | Building good rapport to the private sector secure its support. | Grant aid (e.g., Invest Africa) TA from donors. |
| | Regulations and legislation Ensuring accountability, and transparency. | All selected agricultural value chain. | Private sector preventatives and industry associations to lobby for reform. | Grand aid. |
| Infrastructure development | Development and upgrading of export corridors, SEZs, industrial parks, and logistics centre. | Agri-enterprises | PPPs | IFC programme for SEZs. FDI into SEZs. |
| | Expansion, upgrading and modernizing transpiration, logistics, and ICTs | All selected agricultural value chain. | PPPs Selected banks and institutional investors | Grant aid Concessional loans form the World Bank Non-concessional finance |
| Support for mobilisation | Better access to finance for agro-enterprises Support for agro-industrial projects. Mobilization of alternative financing sources (national climate and natural resources funds, local government bonds, PPPs) for implementation. Planning and institutional coordination across | All selected agricultural value chain. | Active role for private sector including PPPs. Needs good relationship with private sector | DFIs. Grand aid like Invest Africa TA from donors |

| | | | | |
|--|---|--|--|--|
| | government ministries, departments and agencies. Framework and systems for monitoring and evaluation | | | |
|--|---|--|--|--|

A vibrant multi stakeholder consultative process is essential for the implementation of these recommendations. This should be accompanied by improved institutional coordination and strengthening to boost participation. Pro-active engagements via regular and open dialogue between the Revolutionary Government of Zanzibar, Government of Tanzania and other partners (i.e. private sector, development partners, development finance institutions, foreign investors) around this proposed recommendation such as agri-investment promotion, infrastructure expansion and modernization skills development and training initiatives, capacity-building for improved planning and institutional coordination is essential. Institutions such as REPOA can play an important role is catalysing this process by providing evidence-based recommendations on all key elements identified above.

References

1. Agricultural Council of Tanzania: www.actanzania.org
2. Agriculture Non-State Actors' Forum (ANSAF). Proceedings of the 5th Annual Agricultural Policy Conference, Morena Hotel, Dodoma, Tanzania, 13–15 February 2019. Retrieved from <http://ansaf.or.tz/>
3. Baffes, John. (2003). Tanzania's Coffee Sector: Constraints and Challenges in a Global Environment. World Bank. Retrieved from <http://siteresources.worldbank.org/>
4. Baregu, S.; Barreiro-Hurle, J. and Maro, F. (2013). Analysis of Incentives and Disincentives for Coffee in the United Republic of Tanzania. Technical notes series, Monitoring African Food and Agricultural Policies Project (MAFAP). Food and Agricultural Organization (FAO), Rome. Retrieved from <https://agriknowledge.org/>
5. Belgian Development Agency (BTC). (2012). Organic Spices in Tanzania: Opportunities for Producers of Organic Ginger, Chilli and Vanilla. Retrieved from https://issuu.com/tradefordevelopmentcentre/docs/market_study_organic_spices_final
6. Benefits of seaweed farming (2017) - Retrieved 12 July 2017, from <http://www.thecitizen.co.tz/News/national/Benefits-of-seaweed-farming/1840392-2593302-4ylqlaz/index.html>
7. Blouin, Arthur and Macchiavello, Rocco. (2017). Strategic default in the international coffee market. International Growth Centre, Working Paper Ref # F-89305-CCP-1. Retrieved from <https://www.theigc.org/>
8. Borrella, Irma; Mataix, Carlos and Carrasco-Gallego, Ruth. Smallholder Farmers in the Specialty Coffee Industry: Opportunities, Constraints and the Businesses that are Making it Possible. Institute of Development Studies Bulletin, 46(3), May 2015. John Wiley & Sons Ltd, Oxford
9. Bullock, Renee. (2012). Smallholder Farmers in Global Value Chains: Spice Market Participation in Tanzania. Centre for African Studies Research Report. Retrieved from <http://sites.clas.ufl.edu/africa/files/CASRR12-13-Bullock.pdf>
10. Business Daily. 2017. Rising EU blockage worries Kenyan fresh produce exporters. [online] Available at: <http://www.businessdailyafrica.com/economy/Rising-EU-blockage-worries-Kenyan-fresh-produce-exporters/3946234-3981724-8cpt9vz/index.html> (Accessed 27 August. 2017)
11. Centre for the Promotion of Imports (CBI). (2016). CBI Buyer Requirements: Spices and herbs in Europe. Retrieved from <https://www.cbi.eu/> See also CBI Product Factsheet: Sustainable spices and herbs in Europe.
12. Centre for the Promotion of Imports (CBI). Available at <https://www.cbi.eu/market-information/spices-herbs/buyer-requirements/> For a comprehensive collection of materials and guidance on EU Food safety requirements see the
13. Chang, Kaison. (2013). Policy developments affecting jute and hard fibres markets and their implications for production and trade. Food and Agriculture Organization of the United Nations. Available at <http://www.fao.org/>
14. Cheji Bakari. State says intends to retake idle Tanga sisal plantations. Daily News, 11 December, 2017. Available at <https://www.dailynews.co.tz/>

15. COMESA-EAC-SADC Tripartite, 'Tanzanian Ports Authority,' September 2011, pages 4 and 5.
16. COSTECH, (2015), Zanzibar Research Agenda 2015 - 2020 <http://www.costech.or.tz/wp-content/uploads/2015/03/Zanzibar-research-agenda1.pdf>
17. De Groot, H.L.F., G. J. Linders and Rietveld. 2003. 'Why do OECD Countries Trade more?' Tinbergen Institute Discussion Paper T1 03-092/3.
18. Department of Agriculture, Forestry and Fisheries, South Africa. (2015). Sisal Production Guideline. Available at <http://www.daff.gov.za/>
19. Doing Business: www.doingbusiness.org
20. Economic and Social Research Foundation (ESRF). Quarterly Economic Review. Volume 15, Issue 2, April - June 2015. Available at <http://esrf.or.tz/>
21. EUBGTZ, 2016. European Investment in Tanzania: How European Investment Contributes to Industrialization and Development in Tanzania.
22. EUBGTZ, 2016. Policy Briefing: Port Operations in Dar es Salaam.
23. European Spice Association. (2015). Quality Minima Document Rev. 5. Available at <https://www.esa-spices.org/index-esa.html/publications-esa>
24. Fisheries Act No. 8 of 1988 and the Zanzibar Trading Act No. 4 of 1989, Section 17.
25. Food & Agricultural Organization of the United Nations. (2011). Policy Issues Affecting Trade in Fibre and Products. Joint Meeting of the Thirty-Sixth Session of the Intergovernmental Group on Hard Fibres and the Thirty-Eighth Session of the Intergovernmental Group on Jute, Kenaf And Allied Fibres Salvador City, Bahia, Brazil, 16-18 November 2011. Available at <http://www.fao.org/>
26. Food & Agricultural Organization of the United Nations. (2013). Fibres Policy Review. Joint Meeting of the Thirty-Seventh Session of the Intergovernmental Group on Hard Fibres; The Thirty-Ninth Session of the Intergovernmental Group on Jute, Kenaf and Allied Fibres; and the Eighteenth Session of the Sub-Group Of Sisal and Henequen Producing Countries, Negombo, Sri Lanka, 5 - 7 November 2013. Available at <http://www.fao.org/>
27. Food & Agriculture Organization of the United Nations. (2013). Potential Constraints to Smallholder Integration into the Developing Sisal Value Chain in Tanzania. Report submitted to the Joint Meeting of the Thirty-Seventh Session of the Intergovernmental Group on Hard Fibres; The Thirty-Ninth Session of the Intergovernmental Group on Jute, Kenaf and Allied Fibres; and the Eighteenth Session of the Sub-Group of Sisal and Henequen Producing Countries. Negombo, Sri Lanka, 5 - 7 November 2013. Available at <http://www.fao.org/>
28. Food & Agriculture Organization of the United Nations. (2017). Review of the Sisal Market Industry: Market
29. George Sembony. Women take up men's work, cutting sisal as times change. The Citizen, 20 January, 2018. Available at <http://www.thecitizen.co.tz>
30. George, Edward. The coffee sector in Sub-Saharan Africa. Presentation at the ICO, 4 March 2014, London. Retrieved from <http://www.ico.org/>
31. Global Coffee Platform. (2016). National Coffee Platforms: Public/Private Alignment for a Sustainable Coffee Sector. Retrieved from <http://www.globalcoffeeplatform.org/>
32. Global Horticulture Initiative (GHI). 'Kenya Position Paper. Prepared for the Post-Harvest and Transport Technology issues in East and Southern Africa Video Conference, June 22, 2010.

33. Global Horticulture Initiative (GHI). 'Uganda Position Paper. Prepared for the Post-Harvest and Transport Technology issues in East and Southern Africa Video Conference, June 22, 2010.
34. Global Trade Information Service (GTIS). Global Trade Atlas Database. <http://www.gtis.com/gta/usitc>
35. Good Herbs. (2013). Food Safety and Quality Management for Spices Since Spices and Culinary Herbs Production Until Their Consumption. Retrieved from <http://good-herbs.eu> See also International Organisation of Spice Trade Associations. (2013). General Guidelines for Good Agricultural Practices on Spices and Culinary Herbs. Prepared with assistance from the ITC. Retrieved from <https://www.esa-spices.org/download/iosta-gap-final.pdf>
36. Grossman, G. H. and E. Helpman. 1991. Innovation and Growth in the Global Economy. MIT Press, Cambridge MA.
37. Herms S. (2015). Business Opportunities Report: Spices #6 in the series written for the Ethiopian Netherlands business event 5–6 November 2015, Rijswijk, The Netherlands.
38. Hillbom, Ellen. (2014) From millet to tomatoes: incremental intensification with high-value crops in contemporary Meru, Tanzania. *Journal of Eastern African Studies*, 8(3): 400–19.
39. <https://www.dandc.eu/en/article/zanzibar-promotes-locally-grown-organic-cloves-world-market>)
40. [https://www.trademap.org/\(S\(sdiwsvwbnmkskc12po0rezus\)\)/Product_SelCountry_TS.aspx?](https://www.trademap.org/(S(sdiwsvwbnmkskc12po0rezus))/Product_SelCountry_TS.aspx?)
41. https://www.trademap.org/Product_SelProduct_TS.aspx?nvpm=1||||TOTAL|||4|1|1|2|2|1|1|1|1
42. Hurtade, Anicia Q; Critchley, Alan T and Neish, Iain C (Eds). (2017). *Tropical Seaweed Farming Trends, Problems and Opportunities*. Springer.
43. International Coffee Organization (ICO). Annual Review 2015/16. Retrieved from <http://www.ico.org/>
44. International Coffee Organization. (2016). Assessing the economic sustainability of coffee growing. International Coffee Council 117th Session, 19–23 September 2016, London. Retrieved from <http://www.ico.org/>
45. International Growth Centre. (2015). A comparative analysis of the coffee value chain. Retrieved from <https://www.theigc.org/>
46. ITC's Tanzania Spices Sector Strategy (2014)
47. Jimenez, Gloria. (2005). The development of coffee cultivation across Tanzania as exemplified by the Bukoba and Moshi regions. Carleton College, Northfield. Retrieved from <https://apps.carleton.edu/>
48. Keyser, John C.; Chalu, Henry Chalu and Namutebi, Fiona. (2010). Tanzania and Uganda: Kagera-Rakai Parallel Value Chain Analyses of Coffee and Maize. Draft ESW Working Paper, World Bank. Retrieved from <http://siteresources.worldbank.org/>
49. Kimaro, Didas N; Msanya, Balthazar M and Takamura, Yasuo. (1994). Review of Sisal Production and Research in Tanzania. *African Study Monographs*, 15(4): 227-242, December 1994. Kyoto University, Japan. Available at <https://repository.kulib.kyoto-u.ac.jp/>
50. Kimaryo, Primus. Tanzania Coffee Industry Report 2016–2017. *African Fine Coffees Review Magazine*. July–September 2017, 7(4). Retrieved from <https://afca.coffee/>

51. Kingu, John. (2014) Impact of trade reform on coffee in Tanzania: A time series Analysis. *Journal of Economics and Sustainable Development*, 5(5): 58. Retrieved from <http://www.iiste.org/>
52. Kremer, M. 1993. The O-ring Theory of Economic Development, *Quarterly Journal of Economics*, 108(3), pp. 551 - 575
53. Kwaramba, M., 2013. Trade Reform and Quality Upgrading in South Africa: A Product-Level Analysis, AGRODEP Working Paper Series 0002.
54. Leyaro, Vincent and Morrissey, Oliver. (2013). Expanding Agricultural Production in Tanzania: Scoping Study for IGC Tanzania for the National Panel Surveys. International Growth Centre Working Paper.
55. Match Maker Associates, 2017. Mapping of Production of Fruits and Vegetables in Tanzania, Phase 1. Study commissioned by the Embassy of the Kingdom of Netherlands.
56. Mhando, D. G., Haller, T., Mbeyale G. & Ludi, E. 2013. Adaptation to changes in the coffee value chain and the price of coffee among coffee producers in two villages in kilimanjaro, Tanzania. *African Study Monographs*, 34 (1): 27–56. Retrieved from <http://jambo.africa.kyoto-u.ac.jp/>
57. Ministry of Investment, Trade and Industry (MITI): www.miti.go.tz
58. Mkandya, E. et al. (2010). The Impact of Market Reform Programmes on Coffee Prices in Tanzania. *Tanzania Journal of Agricultural Sciences*, 10(1): 38-45.
59. Mmari, Donald. (2012). Competitiveness of Tanzanian Coffee Growers amid Bifurcated Coffee Markets. REPOA Brief No. 30. Retrieved from <http://www.repoa.or.tz/>
60. Modor Intelligence. (2017). Global Seasoning and Spices Market - Growth, Trends and Forecasts (2017-2022). Available at <https://www.mordorintelligence.com/>
61. Modor Intelligence. (2017). Global Seasoning and Spices Market - Growth, Trends and Forecasts (2017-2022). Available at <https://www.mordorintelligence.com/>
62. Mofya-Mukuka, Rhoda and Abdulai, Awudu. (2013). Effects of Policy Reforms on Price Transmission in Coffee Markets: Evidence from Zambia and Tanzania. Working Paper No. 79, September 2013. Indaba Agricultural Policy Research Institute (IAPRI) Lusaka, Zambia. Retrieved from <http://www.iapri.org.zm>
63. Msuya, (2017), Retrieved 12 July 2017, from <http://www.wiego.org/sites/default/files/publications/files/Msuya-Zanzibar-Seaweed-Farming-OHS-2012.pdf>
64. Mwimo, Lucas et al. Contract Farming Schemes in Tanzania: Benefits and Challenges. Bank of Tanzania Working Paper Series. WP No 8: January 2016. Available at <http://www.bot.go.tz/>
65. Nathan Associates, Corridor Diagnostic Study, vol.1, April 2013.
66. National Bureau of Statistics, Tanzania: www.nbs.go.tz
67. National Coffee Conference. Presentations from TCB, TaCRI and TAWOCA. May 2017. Retrieved from <http://www.coffeeboard.or.tz/>
68. Neish, Iain C. (2013). Feasibility Assessment for a Zanzibar MUZE seaweed processing facility (ZANMUZE). Report submitted for UNIDO Project No. 13083 – ‘Building Seaweed Processing Capacities in Zanzibar and Pemba: Creating Value for the Poor’.

69. Neish, Iain C. and Msuya, Flower E. (2015). An Analysis of Production, Markets and Market Systems for Farmed Seaweeds from Zanzibar. Report submitted for FAO Project No. TCP/URT/3401
70. Neish, IC & Msuya, F. E. (2013), Seaweed Value Chain Assessment of Zanzibar. Report submitted for UNIDO Project no 13083 on 'Building Seaweed Processing Capacities in Zanzibar and Pemba: Creating value for the poor'
71. Nguni, Winnie and Chalu, Henry. (2014). Value Chain Coordination in Coffee Sector: An Analysis of Influencing Factors for Smallholders Upgrading in Tanzania. University of Dar es Salaam. Retrieved from <http://repository.udsm.ac.tz>
72. Office of the Chief Government Statistician (OCGS), (2017), Retrieved 12 June 2017, from <http://www.ocgs.go.tz>
73. P & S Market Research. (2015). Seasonings and Spices Market by Product, by Geography - Global Market Size, Share, Development, Growth and Demand Forecast, 2011-2020. Available at <https://www.psmarketresearch.com/> See also Persistence Market Research. (2014). Global market Study on Seasonings and Spices: CAGR Estimated at 4.8% over 2014-2020, Europe and APAC to Continue Dominance. Available at <https://www.persistencemarketresearch.com>
74. Prospects and Policy. Joint Meeting of the Thirty-Ninth Session of the Intergovernmental Group on Hard Fibres and the Forty-First Session of the Intergovernmental Group on Jute, Kenaf and Allied Fibres, Tanga, United Republic of Tanzania, 15-17 November 2017. Available at <http://www.fao.org/>
75. Samper, Luis F. and Quiñones-Ruiz, Xiomara F. (2017). Towards a Balanced Sustainability Vision for the Coffee Industry. Retrieved from <http://www.mdpi.com/journal/resources>
76. Siani.se. 2017. 'How can Avocado Improve the Livelihoods of Smallholders in Tanzania? (Online). Available at <http://www.siani.se/news/how-can-avocado-improve-livelihoods-smallholders-tanzania> (Accessed 20 August, 2017).
77. Sokoine Agricultural University: www.suanet.ac.tz
78. Sokoine University of Agriculture (Bureau for Agricultural Consultancy and Advisory Service). 2005. Coffee Baseline Report 2005, prepared for TaCRI
79. Stewart, Hayden, Jeffrey Hyman, Andrea Carlson and Elizabeth Frazao, 2016. The cost of satisfying fruit and vegetable recommendation in the dietary guidelines, EB-27, U. S. Department of Agriculture, Economic Research Service.
80. Tanzania Bureau of Standards (TBS): www.tbstz.org
81. Tanzania Cluster Competitiveness Program: Horticulture Strategy Development Background Document December 2009
82. Tanzania Coffee Board. Tanzania Coffee Industry Development Strategy 2011–21
83. Tanzania Coffee Research Institute (TaCRI). Strategic Action Plan IV, 2017/2018–22/2023
84. Tanzania Horticultural Association (TAHA): www.taha.or.tz
85. Tanzania Horticulture Sector Outlook: Opportunities and Challenges, Ministry of Economic Affairs of the Kingdom of Netherlands, The Netherlands
86. Tanzania Investment Centre (TIC): www.tic.co.tz

87. Tanzania Ministry of Agriculture, Food Security and Cooperatives: www.kilimo.co.tz
88. Tanzania Organic Agriculture Movement (TOAM). (2015). The Organic 'Window of Opportunity'. Retrieved from <http://www.kilimohai.org/>
89. Technoserve. (2013). The Coffee Initiative Phase One Final Report, 2008 to 2011. Retrieved from <http://www.technoserve.org/>
90. The American Spice Trade Association (ASTA) has prepared numerous guidance materials for spice producers dealing with food safety. They include the Identification and Prevention of Adulteration Guidance Document; the updated HACCP Guide to Spices and Seasonings and Good Manufacturing Practice (GMP) Guide for Spices. Retrieved from <http://www.astaspice.org/food-safety/haccp-guide-to-spices-and-seasonings/>
91. The World Bank, 'Doing Business' Database
92. The World Bank, 'World Development indicators Database'.
93. UN Food and Agricultural Organization (FAO). Making the United Republic of Tanzania's Coffee Sector More Competitive. Monitoring African Food and Agricultural Policies Project (MAFAP) Policy Brief No. 14, July 2013. Retrieved from <http://www.fao.org/mafap>
94. United States Department of Agriculture. (2017). Coffee: World Markets and Trade. Foreign Agricultural Service. Retrieved from <https://apps.fas.usda.gov/>
95. USAID. (2010). Tanzania coffee industry value chain analysis. Profiling the actors, their interactions, costs, constraints and opportunities
96. Webber, C. Martin and Labaste, Patrick. (2010). Building Competitiveness in Africa's Agriculture: A Guide to Value Chain Concepts and Applications. World Bank. Retrieved from <http://siteresources.worldbank.org/>
97. Wenban-Smith, H. (2014). Rural-Urban Linkages: Tanzania Case Study. Working Paper Series N° 127. Working Group: Development with Territorial Cohesion. Territorial Cohesion for Development Programme. Rimisp, Santiago, Chile.
98. Workman, Daniel. (2017). Coffee Exports by Country. Retrieved from <http://www.worldstopexports.com/>
99. World Bank. (2015). Risk and Finance in The Coffee Sector A Compendium of Case Studies Related to Improving Risk Management and Access to Finance in the Coffee Sector. Agriculture Global Practice Discussion Paper 02. Retrieved from www.worldbank.org

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The Member States of the European Union have decided to link together their know-how, resources and destinies. Together, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

TRADECOMI PROGRAMME

  BUILDING ACP TRADE CAPACITY
RENFORCER LES CAPACITÉS COMMERCIALES DES ACP