



National Circular Economy Framework & Guide for Entrepreneurs for São Tomé and Príncipe

Country report

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Introduction

Circular economy (CE) has been on the rise across the globe due to a growing concern about resource extraction rates and pollution arising from production processes under the linear economic model. The CE is “an industrial system that is restorative or regenerative by intention and design” (EMF 2013). The CE goes beyond recycling and waste reduction as it aims to value waste and keep materials in circulation for as long as possible. It is about extracting higher value from fewer resources by increasing productivity and efficiency, and moving from ownership to access of products, creating a sharing mindset allowing to reduce consumption thanks to increased efficiency of asset use. For island states, the CE is highly relevant due to their vulnerability to climate change and pollution but also due to the reliance of countries on import of most products consumed. The Indian Ocean Commission has therefore secured funding from the World Bank to support the SWIOFish regional project and increase efforts to set up a circular economic model for the supply and production chain to reduce downstream marine pollution. The CE Project’s aim for each AIODIS country is to foster a circular economy and protect the environment and natural assets while aiming for economic growth.

The objective of the report is to present a national policy framework and guidelines for entrepreneurs. Through collaboration with local experts and government officials, local agencies and international foundations, an understanding of the current situation has been established in the review report. Possible approaches and actions have now been identified to move forward. These actions are gathered within the present document. Thanks to incentives and policy adaptations made throughout the past decade, São Tomé and Príncipe already created the fundamentals to proceed within specific sectors such as agriculture and fishery. Additionally, in collaboration with the Food and Agriculture Organization of the United Nations, efforts toward a sustainable blue economy are being undertaken. Involvement from the private sector as well as awareness campaigns have additionally increased the understanding of the concept of a circular economy and cornerstones have been laid within the society.

The document is divided into two parts. First, it presents a policy framework to foster CE and respective suggested legislative implementations for São Tomé and Príncipe. To facilitate the connection between authorities and policies and the private sector it is important to guarantee a common understanding and the comprehension on how to proceed, with the goal of a circular economy in mind. The second part of this document then presents CE guidelines for entrepreneurs. Implementing a CE goes beyond recycling and waste reduction as it aims to value waste and keep materials in circulation for as long as possible. It encourages extracting higher value from fewer resources by increasing productivity and efficiency. Therefore, to move towards a circular economy it is crucial to involve local businesses and the private sector in order to facilitate the collaboration, implementing respective practices along the path within production, distribution and treatment facilities. The guidelines for entrepreneurs are linked to the policy framework and legislative suggestions made during the first phase. Explanations on how to set up a business in São Tomé and Príncipe with a circularity target, as well as the transition toward more sustainable business practices for established companies will be included and offer step-by-step advice along the way. This will allow to close a gap of informality within different sectors and better involve authorities and businesses in the common quest toward a circular economy.

1. Policy framework

The framework to lay out possible paths moving forward based on the particularities of São Tomé and Príncipe and feedback from local experts participating on this work. Acting upon present circumstances in place legislation will be promoted to develop a circular economy further while aiming to identify additional opportunities to expand the economy and improve aggregate efficiency of materials.

1.1 Establish regulations for the country's Circular Economy

National Policy goal: The government need to adopt a statement committing to a circular economy and fill the legal gaps. A number of legal texts exist in the country but they are not harmonised nor far reaching enough to address CE (See Annex 1).

Rationale: There is no interaction between industry and authorities for common action. The government did not make its target for a circular economy known and also did not offer a clear indication on how to follow through with it.

In São Tomé and Príncipe, the polluter pays principle (PPP) has not been implemented within the national environmental policy, and is yet to be decided to be controlled and monitored by the Commission for monitoring and evaluation of the application of the environmental impact tax (CMEAET) which was created to ensure the monitoring and enforcement of the tax, and is the responsibility of the Ministry of Decentralization. The PPP is not yet picked up throughout the industry, often the driving force behind circular economic progress in the country. The public sector is responsible for the waste collection and financial burden of the pollution costs, but the waste management system in place is little developed and only offers limited ground for future waste management upgrades. São Tomé and Príncipe recognizes the Extended Producer Responsibility (EPR) in the Decree-Law No. 64/2013 creating the Environmental Impact Tax but its implementation has been lacking follow-through. The Ministry of Infrastructure and Natural Resources is pushing for its implementation under the country's new country strategic plan (2019-2024). Since neither EPR nor PPP are developed enough in São Tomé and Príncipe, they do not to provide a CE basis to reduce marine and plastic pollution.

To achieve the above goal, it is suggested that the country adopts a declaration or an umbrella legislation that promotes integration of actors and harmonisation actions towards a CE. Commitment to the CE could be integrated into existing or upcoming blue economy policy of the country.

Specific actions needed: There is a need to adopt specific legislation that is currently lacking to promote a CE. These legislations need to be able to harmonize with existing laws, namely Law 10/99 which is the basic law of the environment that defines the bases of environmental policy for the sustainable development of the Democratic Republic of São Tomé and Príncipe and establishes the principles that guide it. Within the framework of the Political Constitution and the Rio Declaration on Environment and Development, Law 8/2020 Measures to reduce the use of plastic in STP and aims to ban the import commercialization and distribution of non-biodegradable plastic bags in São Tomé and Príncipe. Law 7/2018 ensures all water resources management, to create a mechanism that makes the aforementioned laws viable and that is able to make it easy from the ban the use of plastic, the management of waste and water resources that makes it easy to create an ERP or PPP.

1.2 Educate through awareness and education campaigns

Mobilising actors for the CE: To achieve a CE in São Tomé and Príncipe, it is essential to increase literacy on CE at all levels, especially in key sectors of the blue economy. The Concept of CE is still new at the national level; both population and governments are not aware of the benefits of a circular economy.

Rationale: There are currently limited efforts from the civil society to sensitise population through agencies.

To achieve the above goal, examples of specific actions needed include:

- Continued workshops in place engaging society at large.
- Build collaboration between large industrial partners and authorities.
- Reintroduce school campaigns to raise awareness within youth.
- Increase interaction with companies to introduce them to circular economic models and make them understand the necessity of it.

Specific actions needed: There is a need to support and replicate existing initiatives and other educational activities in place at the level of governments, businesses and the population. In São Tomé and Príncipe, awareness campaigns about the CE and blue economy have started recently and can be seen in the sectors of fisheries and agriculture. (see Annex 2)

1.3 Improve material stock management

1.3.1 Collection and sorting system

Optimising Waste value: To improve the waste management processes currently in place, it is recommended to optimise existing collection systems and introduce sorting systems. Currently, collection and transportation is done with worn-out transportation, and there are insufficient collection means and a lack of planning, leading to a collection coverage of only about 38 percent. This need for an optimised system is also acknowledged in the report on marine plastic under the AIODIS project.

Regarding waste treatment, no treatment is currently given to undifferentiated waste. There are small unique initiatives for the treatment of the organic fraction, but efforts are limited due to missing public backing or funding. As for recycling and reuse, there is a waste processing plant but the quantities recycled are still insignificant to generate an impact on the system.

Rationale: Waste is collected daily through collection of waste from containers. The collection is still made in an undifferentiated way, where no waste material separation or sorting is practiced and collection and transport of waste is within the responsibility of the municipality, leading to missing national common ground that could simplify future systemic improvements.

From the above it is then necessary to increase collection points, collection transport and equipment, improve sorting procedures and introduce a treatment site that allows for waste valorisation and sustainable practices that go beyond incineration. Especially hospital and medical waste that is currently dumped and burned in the open air is identified as an area in need of change.

Specific actions needed: An important step in this process is to encourage the creation of companies that can collect in a sustainable way and allow for waste valorisation. Additionally, the state should aim to create conditions for the sector to become attractive and foster waste material sorting and replicate it nationally. Currently companies that responsibly collect and sort waste do not exist and will need to be established first in order to address the matter effectively. A clear waste management structure should then be put in place to allocate the responsibilities along the collection and treatment process. (see annex 3)

1.3.2 Waste treatment facility

Improving efficiency of waste treatment sites: Addressing processes at waste treatment facilities represents a key step towards achieving circularity. To do so, the country should target to increase efficiency of current facilities and introduce more sustainable sites like landfill with gas congestion, incineration with energy recovery, waste sorting and cleaning sites and ultimately recycling stations. Existing facilities do not allow valorisation of waste and do not achieve their goals of reducing waste hence efforts to increase waste valorisation and efficient management at incineration sites need to be ongoing.

Rationale: A first step would be to assess existing waste treatment facilities but the government has not yet started discussions to upgrade or replace current landfill sites. Options to upgrade recycling plants, like the one currently already practicing glass recycling, are being evaluated by the authorities but no consents have been found yet. Efforts to increase waste collection, reduce littering and introduce recycling are being developed in a very timid way and without accountable results.

To achieve circularity, existing solutions include implementing waste valorization systems that allow to explore the part of energy valorization through biogas and also the production of organic compost with the main applicability in agriculture is deemed helpful.

Specific actions needed: For São Tomé and Príncipe options include creating new companies treating waste with circular motives under a common framework and on a common structural system. Companies that have waste valorisation processes currently do not exist and will need to be set up to take a step toward a more sustainable waste management system. (see annex 3)

1.3.3 Dumping and littering

Reducing pollution through improved waste management: For the country's blue and circular economy, reducing waste and related pollution at all levels and especially in the ocean is paramount. There is currently an important level of industrial pollution and accumulation of waste from littering in cities and on beaches.

Rationale: In São Tomé and Príncipe, anti-dumping and littering legislation need to be enforced more thoroughly and existing fines need to be harmonized and applicable. A body of control is in place and operated by the public sector. Responsible for monitoring company waste streams is the general environmental direction but in practice the system is not functional and industrial dumpsters are not currently supervised by the General environmental direction.

It then becomes obvious that the country needs to better monitor industrial waste and establish fines, introduce material use understanding across sectors such as manufacturing, tourism and fisheries.

Specific actions needed: For São Tomé and Príncipe, the solution lies within creating a program for industrial waste monitoring and a subsequent penalty system that is enforced on the entirety of the industry to manage large industrial waste flows.

1.4 Restore and better manage the use of natural flow

Managing natural resources: To achieve a sustainable use of natural resources within a CE, there is a need to upscale and further support existing initiatives. They should aim at regenerating natural flows especially in the blue economy sectors such as fisheries, tourism, oil and gas exploration and bioprospection. There is currently a low level of environmental protection of natural resources with less than 1 percent of the EEZ and coastal ecosystems being protected. The deal with ERHC Energy

Inc., giving the company the rights to manage parts of the national EEZ, is of particular interest as it offers future opportunities for sustainable energy production. Despite existing environmental texts to protect ecosystems and biodiversity and growing conscience of the issue, high levels of biomass are extracted through, among others, fisheries.

Rationale: A research centre and directions of state for the monitoring of natural resources such as fish stocks, forest abundance, wildlife preservation and water pollution is established. As a follow up on existing monitoring efforts of natural resources, there are limited controlling efforts like implementation of resource use permits.

Available solutions include increasing protection of EEZ through MPAs, reinforcing monitoring of existing MPAs and area-based management and increasing restoration activities while also introducing financial reprimands against offenders.

Specific actions needed: A first step could be to improve existing monitoring practices and capabilities while preventing ongoing harmful practices through fines. A close collaboration with ERHC Energy Inc. should be sought to increase control and sustainable use of the EEZ while assessing renewable energy options. Building better knowledge on the use of natural resources will provide evidence for future resource extraction rate decision-making. To address regeneration of natural flows, a parallel step is to support and upscale existing activities such as fishery closures, mangrove restoration and locally-managed marine areas/MPAs.

1.5 Incentivise businesses

Putting businesses at the centre of the CE: Increasing the involvement of businesses and entrepreneurs is a stepping stone towards achieving circular and blue economy activities. Businesses and entrepreneurs are not aware of the opportunity the CE presents while those already involved in CE related activities are not well supported by the officials.

Rationale: The public sector is not aware of private sector initiatives and efforts toward a circular economy and does not monitor circular business practices. The government does not encourage businesses by providing incentives for a circular economy within businesses or supporting them financially through subsidies, aides, tax reductions or operative advice.

The lack of governmental monitoring of business practices and the understanding of circular efforts does not allow there to be grouping of companies according to equipment, material use and production practices to encourage a closed loop or industrial collaboration called symbiosis.

To promote the adoption or transition to a CE business, the government needs to provide structural and financial support to businesses including through:

- The creation of a circular economy office within one or several of the government departments
- The creation of company grouping according to business activity, material use, equipment requirements and proximity to improve material use and infrastructural efficiency while reducing supply chain and waste treatment costs by sharing them among a group of firms
- Undertaking a dialogue with industry to create valorisation of waste materials
- Introducing tax relief system such as 3-5 year starting period of complete tax exemption or reduction
- Cutting repair and refurbish value added tax to encourage reuse businesses

Specific actions needed: In São Tomé and Príncipe most efforts are done by international NGOs or the private sector, while governmental support and initiatives are limited. Existing official programs providing subsidies, aides, tax reductions or operative advice need better promotion amongst businesses. There is also a need for more governmental initiatives to incentivize businesses to adopt circular models and a need for increased efforts to support current efforts.

2. Guide for entrepreneurs

To implement a circular economic model within businesses and across sectors through synergies both governmental and private sector efforts are required to create the right environment. Since private sector actors are able to decide and act quickly, companies can be the driving power toward a local circular economy. Businesses are currently in the position where they can drive the change by taking initiative and transition toward circular economic practices and influence governmental decisions on the matter to follow accordingly.

In order to engage businesses in efforts to achieve a circular economy it is necessary to provide them with guidelines on how to set up and transition toward a circular production cycle. Through consultation of local experts, consultants and governmental officials this document pinpoints to existing good practices as well as barriers and opportunities for a circular economy. Feasible solutions and possible stakeholders to become involved in the process have been identified and the guidelines are designed to create discussion across sectors to form synergies and break the linear economic model. Identifying and pointing out possible company collaborations as well as step-by-step guidelines for sustainability seeking businesses are starting points towards the final goal of protecting maritime resources and reducing ocean pollution.

The guidelines can help start-ups as well as existing companies to establish business models that allow for more efficient resource management while phasing out waste creation and thereby counteract maritime pollution at its source. The guidelines offer upcoming entrepreneurs administrative advice to set up their business and identify the main modalities of implementation for a circular economy. For existing businesses, the guidelines include step-by-step council on how to transition toward sustainable production and system processes that are associated with a circular economy. The guidelines conclude with in-depth solution proposals and opportunities for companies to pick up upon and implement in their ongoing quest for sustainable processes. Based on the content of this document companies will be able to make relevant progress leading to improved resource management, reduced waste generation and diminished maritime pollution for island states.

2.1 Creating a new CE business

2.1.1 Establish the mission, vision and objectives of the company

The company's mission must embody its essence and reason for being. The vision comes as the way the company is envisioned in the mid-long term. Objectives of the company should be derived from the founders' goals (personal and professional motivations) and should tackle environmental and social challenges, and satisfy customer needs.

For a CE business, these three elements should refer to one of the CE principles: (1) preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows, (2) optimise resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles, and (3) foster system effectiveness by revealing and designing out negative externalities (P3).

In São Tomé and Príncipe, the fishery, agriculture, tourism, services and manufacturing sectors have been identified as key sectors to drive circular economy. They offer the most impactful and far-reaching opportunities to reduce maritime and land pollution and introduce circularity on the islands of São Tomé and Príncipe.

2.1.2 Identify key stakeholders and customer segments

This step involves identifying and prioritising those stakeholders that will play a significant role in achieving the objectives of the project. Stakeholders include the team (co-founders and employees), partners, beneficiaries (beneficiaries are those who benefit from the value your project generates) and customers. Customers are at the core of the business model as they buy the services or products. The project's main impact in society has to be intrinsically linked to the local community and cover a local demand that is to be met. Another task is to develop a sound understanding of the potential customer base (customer identification and profiling) and the existing market around it (market assessment).

To promote a CE in São Tomé and Príncipe, it is at this stage essential to include stakeholders like governments, civil society organisations promoting CE and institutions like the Ellen MacArthur Foundation. To identify key stakeholders, entrepreneurs should target main suppliers, intermediaries, processing associates as well as customers and public partners of interest. In the above identified sectors of fishery, tourism, agriculture, service and manufacturing identifying and collaborating with some key stakeholders is essential (refer to Annex 4).

2.1.3 Develop the value proposition

CE businesses create environmental value by tackling circularity and environmental challenges (that key driver for their existence) through its business solutions and operations, and social value by empowering their stakeholders (including employees, suppliers, communities and future generations) and meeting the needs of their customers.

To achieve this, it is suggested to create strong collaboration across the board and involve customers and stakeholders in the process of designing and delivering the value proposition (co-creation)

In São Tomé and Príncipe, the issues of marine pollution, excess waste generation, missing waste responsibility, extensive resource extraction, a lack of locally accessible material inputs and the awareness of the population and the state about the need for a better management of resources represent key challenges that will be a good potential value proposition.

2.1.4 Identify the modalities of implementation

2.1.4.1 Key activities and resources

Key activities define what we must do in order to define and offer a value proposition to a specific customer segment. They include problem-solving (such as consulting or counselling), production (manufacturing etc), platform/network/sale, and supply chain management.

Activities within CE businesses should include those proposed in the different business models (in section 4 of this guideline)

Key resources represent all the elements and aspects that are essential for making the business work properly. They include human resources, physical assets, intellectual resources, financial resources and natural resources. For the latter, a special focus should be on the use of recycled materials and sustainable or renewable resources as input materials.

Entrepreneurs also need to consider incoming legislative changes such as laws on PPP, laws on EPR, phasing out of single use plastics. At this stage it can also be helpful to enquire for possible governmental support like tax reduction or investment subsidies.

2.1.4.2 Customer relationships and channels

Different types of relationships can be established with customers such as personal assistance, self-service, automatic service, community based or co-creation.

To properly establish the different types of relations with customers, doing a customer journey map of the particular segment of customers can be useful. A map is an oriented graph that describes a user's journey by representing the different touchpoints that characterise his/her interaction with the service or product.

You will also have to distinguish between the way (channels) to get the customer's attention and how to establish and maintain a close relationship with them. Channels include all means of communication and distribution to reach customers and deliver a value proposition to them.

For CE businesses, it is possible to explore existing initiatives towards sharing economies, introduce and replicate take-back options for customers to return products and help materials stay within the company while exploiting options to continue to interact with customers.

2.1.4.3 Cost structure

It is important to carefully classify costs (fixed and variable costs) so that the business can analyse and improve its performance.

Within a CE, it is useful to explore potential costs linked to niche CE areas and identify cost savings arising from CE practices such as equipment sharing, recycled material purchases or supply and transport costs from abroad.

2.1.4.4 Revenue streams

The business must have an accurate idea of the importance of each revenue stream and which one best matches a particular customer segment and channel. Streams might include asset sale, usage fees, subscription fees, licensing etc.

2.1.5 Test the product or service

Before fully implementing the modalities above, the entrepreneur needs to test key variables:

- Problems and needs identified should be tested by talking to experts in the field or by interviewing key stakeholders.
- Participation of key stakeholders should be verified through diverse types of consultations and meetings on the business objectives where multiple stakeholders can provide a good measure of their willingness to engage.
- Customer segments should be validated through focus groups, interviews, debate or conversations to check their needs, aspirations, gains and pains, etc. Focus groups, interviews, debates, and conversations could be used including on social media.
- Value proposition needs to be tested by building a prototype at small-scale or semi functional versions of the services/products. Here, participants' reaction to the test might include satisfaction level, feedback, and curiosity/ demand for more.

Once hypotheses on the different variables have been tested and validated, the service/product has to be scaled up from prototype to the optimal market size where viability is attained.

To test the circular product or service, a platform where businesses and entrepreneurs can try their green products is considered to be a helpful step for firms to assess feasibility and market conditions for their operations. As no such platform exists yet, a coordinated effort between industry and authorities could allow to put it into existence.

2.1.6 Mobilise tools for implementation

When the business model is validated, implementation of the modalities presented above can be facilitated by various tools. **First** is establishing a financial plan with income statements, balance sheets and cashflow projections, and a funding plan identifying traditional investors and banks as well as other funding mechanisms such as crowdfunding, financial cooperatives, micro-credits, ethical banks. **Second** is having a legal management plan to choose the best-fitting legal form according to the needs and business model. **Third** is setting a roadmap to foresee the progress of the business from year 0 to the medium and long-term. **Fourth** is to have an operation and management plan which dictates how operations are performed and managed by staff and by assigning roles and responsibilities and setting a schedule. Tools used need to be adapted according to the CE business model adopted.

To find the appropriate tools, entrepreneurs can refer to existing governmental departments that provide assistance to businesses such as Investment Promotion Agency (APCI) (refer to Annex 4).

2.1.7 Measure impacts and improve

Effectively measuring environmental and social impacts is essential to CE businesses. In addition to measuring how the business is doing regarding the achievement of objectives and mission, environmental indicators are needed to assess environmental performance. Environmental indicators such as water consumption, material use, waste generated per service or product, or other CE related indicators are suggested to be used in order to assess current performances. Constantly improving the business is key to achieve the circular economic objectives as it is a process that requires ongoing efforts to improve efficiency. Common areas of improvement include levels of participation of stakeholders, communication and marketing to incentivize customers, improve environmental performance, ensure green procurement and increase environmental awareness amongst the public.

2.2 Transitioning to a CE business

2.2.1 Map your impact and set priorities

Learn how to bring together an internal "sustainability team" to set objectives, define targets, review your environmental impact and decide on priorities. In this process, you need to evaluate impacts regarding natural flow use and material stock management. Relevant fields and key aspects to take into consideration in São Tomé and Príncipe could be maritime resource conservation, biodiversity protection, marine pollution, waste generation and waste collection and sorting.

2.2.2 Choose indicators and understand data needs

Identify indicators that are important for your business and learn about what data should be collected to help drive continuous improvement. To assess the circularity of your business, you can use CE related indicators such as: use of renewable energy, greenhouse gas intensity, energy intensity, intensity of your residuals, releases into the air and water.

2.2.3 Measure inputs used in production

Identify how materials and components used into your production processes influence environmental performance. Businesses can also measure CE related performance including: material consumption, resource extraction, renewable energy consumption, waste generation, import of inputs, non-renewable materials, restricted substances, recycled or reused materials. Businesses can check the availability of recyclable materials and monitor availability of waste materials/recycled materials as inputs into production process.

2.2.4 Assess the operations of your facility

Consider the impact and efficiency of the operations in your facility. Residual waste generation and excess material that can be phased out and managed more efficiently going forward (e.g. water consumption, energy intensity, greenhouse gas generation, emissions to air and water, waste generated). Efforts to improve production and material use efficiency toward circularity while reducing waste creation must be ongoing.

2.2.5 Evaluate your products

Identify factors such as energy consumption in use, recyclability and use of hazardous substances that help determine how sustainable your end product is. Businesses can use CE related indicators such as: recycled/reused content of your products, recyclability of your products, renewable materials used in your products, Non-renewable materials used in your products, restricted substances contained in your products, energy consumption in using your products, greenhouse gas emissions from the use of your products. You can also evaluate the possible incentives to recycle and engage customers to return products and possibly keep materials in cycle.

2.2.6 Understand your results

Learn to read and interpret your indicators and understand trends in your performance. Businesses can focus on CE related indicators that align with business models suggested.

Here businesses can make use of governmental offices and agencies or private sector companies that specialised in assisting businesses evaluate their performances. Examples in São Tomé and Príncipe include the 'Investment Promotion Agency' (APCI) is a governmental agency that provides such help.

2.2.7 Take action to improve your performance

Choose opportunities to improve your performance and create action plans to implement them. CE businesses should focus on CE related indicators that align with business models suggested, and stay up to date with new arising sustainable opportunities and drive ongoing progress by pinpointing areas of improvement or non-circular practices.

2.3 Circular Business models for entrepreneurs

2.3.1 Circular design

This CE model relies on the following elements:

- Circular **product design**: use recyclable materials for goods and packaging that allow for a circular system and **local supplies** at a maximum

- Product/service design and provision: **access over ownership** and product service systems
- **Local** supplies and local demand for service/good
- **Economy of functionality** (rent resources rather than buy and own them)

There are existing companies that operate based on an entirely circular design (see Annex 5).

2.3.2 Optimal material and resource use

- **Understand value** of waste materials and engage in opportunities from materials
- **Buy recycled materials** and reduce input material costs
- **Target recyclable and sustainable materials** and pioneer in industrial waste valorisation
- **Introduce Industrial symbiosis**; internalise a maximum of production steps within the company on the same site to reduce transport costs. This also helps with waste creation as all accrues on the same site, making recycling or reusing easier since larger amounts hold more potential
- **Redefine retail**; skip retailers by directly interacting with consumers. Simplifies recycling practices, understanding of consumer behaviour and increases revenue
- **Inspect daily practices** to identify non-sustainable production practices such as use of single use plastics, equipment and garment
- **Adopt a closed-loop process**; use residual outputs and by-products as input for other production processes
- **Set up internal target rates** to increase recycling rates and encourage sorting to improve employee understanding of a circular economy and its benefits

There are no existing companies that optimised resource use by functioning solely with renewable and recycled materials as input yet.

2.3.3. Value recovery

- **Reuse and recycle**: Introduce ways to keep waste materials within the company and the production cycle; Increase material use efficiency
- **Repair and recondition**: produce goods and services to last (quality over quantity) and provide service to repair and refurbish products and services
- **Remake** products that did not meet standards and were considered waste
- **Consumer awareness**: inform customers of recycling and repair opportunities to incentivize closed-loop material use while explaining competitive advantage of your service/product compared to non-circular business models

There are existing companies that maximise the utility and value of some of their materials within their production cycle and reach higher production process efficiency leading to a minimized waste creation (see Annex 5).

2.3.4. Collaborative economy

- **Group businesses** that use similar materials to share transport supply costs and open channels to trade materials between firms
- **Foster cooperation**; exchange good practices and learning experiences between companies to accelerate transition toward circularity

- **Introduce a sharing economy:** collaborate with other businesses to build expensive infrastructure or purchase equipment to improve efficiency of usage (ex; cooling units, trucks, sorting site, ...)

There are very few existing companies that operate on the basis of a collaborative economy and exploit all potential side products and collateral uses that accrue during their production. Additionally, equipment and material sharing are maximised through excessive industrial networking (See Annex 5).

3. Annexes

Annex 1: Type of policies and laws towards circular economy

| | | | |
|----------------------------------|--|---|--|
| Renewable Flow Management | Environmental protection/ Biodiversity Conservation | ✓ | Environmental Law No. 10/99 (1999) |
| | Fisheries management | ✓ | Fisheries Law No. 9/2001 (2001) |
| | Forestry management | ✓ | Forestry Law No. 5/2001 (2001) |
| | Protected Areas | ✓ | Law No. 11/99 on Flora and Fauna conservation and protected areas (1999) National Biodiversity Strategy and Action Plan 2015-2020 (2015) Laws Nº 6 and 7/2006 of August 2nd: Obô Park Law of São Tomé and Obô Park Law of Príncipe |
| | Water management | ✓ | Water Resources Framework Law No. 07/2018 (2018) Order No. 12/2012 approving the Participatory Strategy for Water and Sanitation of Sao Tomé e Príncipe until 2030 |
| | Renewable Energy | X | |
| Stock Management | General waste management | ✓ | National Plan for the Integrated Management of Urban Solid Waste to the period 2018-2023 Decree No. 36/99 regulating solid waste disposal (1999) |
| | Recycling | ✓ | Decree-Law No. 64/2013 creating the Environmental Impact Tax (TIA) (2003 then 2013) |
| | Plastic Bag Ban/ Phase out | ✓ | Law No. 8/2020 Approving Measures to Reduce the Use of Plastic Bags in São Tomé and Príncipe |

Annex 2: Existing awareness raising initiatives and campaigns towards CE

| Initiative name | Description of activity | CE aspect addressed | Link / Contact |
|--|--|---|---|
| TESE - Associação para o desenvolvimento | Promotional videos for kids and the public | Waste reduction | https://www.facebook.com/tese.ongd/videos/316298845957680/ |
| OQUIMAMB | promotes cleaning action in the framework of the Clean World | Waste reduction & Green chemistry promotion | https://m.facebook.com/Lets-Do-It-S%C3%A3o-Tom%C3%A9-Pr%C3%ADncipe-989950781186143 |

Annex 3: Examples of companies doing CE related activities in waste management

| CE aspect | Company | Description of activity | Link / Contact |
|------------------------|-------------------------|---|---|
| Collection | Public service | Depends on municipality | N/A |
| Sorting | N/A | N/A | N/A |
| Treatment | N/A | N/A | N/A |
| Recycling and disposal | CPR São Tomé e Príncipe | Collection and recycling glass into construction material | https://fr-ca.facebook.com/cprsaotome |

Annex 4: Key sectors to foster CE and related stakeholders and supporting platforms

| Key sector | Identified key stakeholders | Relevance of the stakeholder |
|----------------|-----------------------------|--|
| Fisheries | MARAPA | NGO with a lot of experience in the protection of marine and coastal habitats and ecosystems, co-management of fishery resources and support to the actors in the fishing industry |
| Sustainability | OIKOS | is an NGO that bases its area of work on three pillars Humanitarian Action, Sustainable Life, and Global Citizenship. |

Annex 5: Key examples of companies operating under CE business models

| Business model | Company | Activity | Website link or Contact |
|-----------------------------------|---------------|--|---|
| Circular design | ROSEMA | Production of beer | N/A |
| Optimal material and resource use | ECOGESTUS Lda | Production of compost from organic waste | https://www.ecogestus.com/pt/en/projects/ |
| Collaborative economy | Agripalma | industrial oil palm | https://www.socfin.com/en/locations/agripalma |