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Research Article

Circular Economy Model for The Use of Recyclable Waste in Tropical Countries

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Abstract

In every economy in its productive processes there are wastes that can be but are not used, hence models such as those proposed by the circular economy, allow to reduce the amount of waste that ends up in landfills and that become polluting agents of the environment. This article proposes a model for the use of inorganic waste for countries located in tropical areas, where activities related to tourism and crafts are carried out, taking into account the precepts of the circular economy and the orange economy. This model is very useful since it not only contributes to the economy and the generation of income for vulnerable populations, but also contributes to the sustainability of the resources of one of these tropical countries.

Keywords: Solid waste, creative economy, circular economy, handicrafts, tourism.

Introduction

Since the dawn of time, humanity has relied on the productive factors of land, capital, and labor for its subsistence, through the extraction of various raw materials from renewable and non-renewable natural resources. These raw materials have been employed in the diverse productive activities that enable the generation of the goods and services circulating within the economy. This represents a linear productive model that also encompasses its distribution and consumption processes (Hailstones, 1972).

In this context, anthropogenic activities, constrained within the framework of current productive sectors, place significant demands on the planet's finite natural resources. Therefore, its utilization in a

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controlled manner, or in some cases without evident control, generates various environmental effects that, for the most part, are adverse and lead to other negative consequences. This is illustrated in Figure 1:

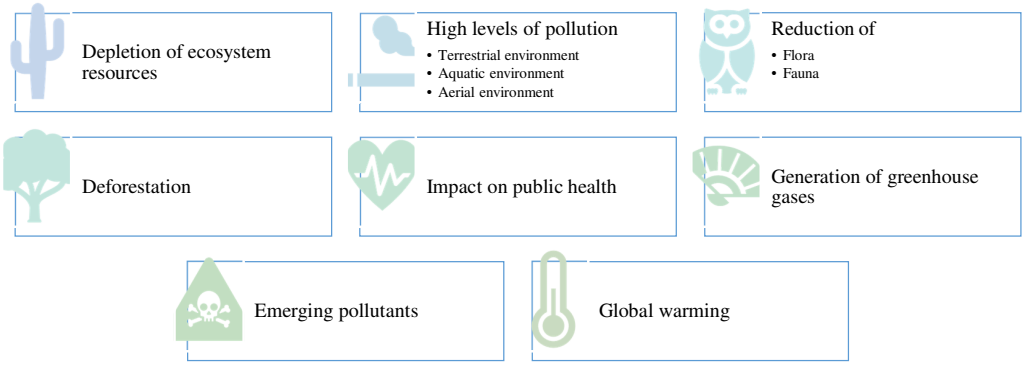

Fig. 1. Effects of the excessive use of natural resources in tropical countries (Prepared by the authors)

The large global population (as of 2021: 7.8 billion worldwide, 650 million in Latin America, and more than 50 million in Colombia) places significant pressure on the environment, constantly demanding vast amounts of resources: water, electricity, clean air, food, raw materials, products, goods, and services. To sustain the economic model, large quantities of solid waste are generated from the goods, products, or services of the various productive sectors. In other words, overconsumption should be avoided, and efforts should focus on reducing the rate of natural resource depletion. Thus, it is better to consider producing more with fewer resources and to begin a gradual transition to an adequate model for natural resource production and management. A model that minimizes the use of raw materials and incorporates reused and recycled elements into the cycle to enhance productivity. Therefore, this new model can achieve a lower negative environmental impact and, in good measure, align with the conceptual framework of the circular economy, fully implementing it within a context such as the orange economy and its associated activities, thereby serving as a driver for this sector (CEPAL, 2016; MMA, 1999; MVCT, 2012; Superservicios, 2019; Miller MX, 2020; Villamil, 2020). Based on population data and per capita solid waste production, reports on total solid waste generation can be consolidated as follows (see Table 1).

Table 1: Data on solid waste generation (Prepared by the authors based on the sources cited)

Level	Quantity	Source
The entire planet	10.14 million tons per day	World Bank (2021)
Colombia	41 thousand tons of waste per day	Superintendencia de Servicios Públicos Domiciliarios (2021)
Arrival of waste at the Doña Juana landfill (Bogotá)	663 tons per day	UAESP (2021)

Tropicality and Climate Variability

A tropical zone has a high prevalence of elevated air temperatures and relative humidity, as well as abundant precipitation, which significantly impacts the soil and subsoil. It also affects ecosystems, public health, and the socioeconomic conditions of the communities residing in these regions. These are regions near the Intertropical Convergence Zone (ITCZ), whose characteristics can be summarized as follows in Figure 2:

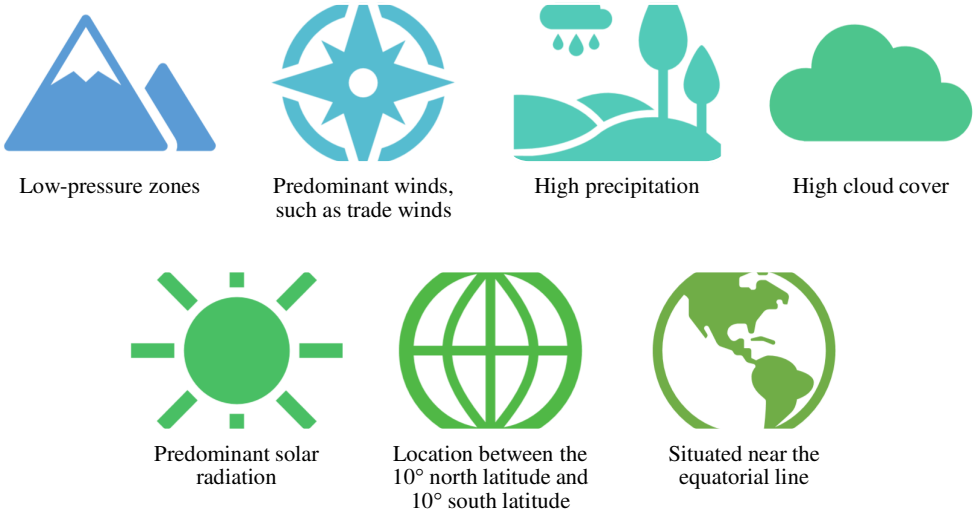

Fig 2. Some characteristics of the countries located in the tropical zone of the planet (Prepared by the authors)

These regions near the equator, considered tropical, include the Amazon Basin, South America, the Congo Basin, the Gulf of Guinea coast, and Southeast Asia. In these areas of seasonal thermal amplitude, meteorological conditions are influenced by atmospheric factors with short-term variations and highly variable weather-related factors, such as air temperature (stable), relative humidity, precipitation (seasonal and abundant variations), wind speed (in some cases < 20 km/h), atmospheric pressure, among others.

They may also experience relative variation due to extreme and recurrent or cyclical climatic phenomena depending on spatial location. Thus, in tropical countries, there is only one climatic season (typically summer) with bimodal dry and rainy season events (due to the ITCZ) featuring high humidity (absolute or relative) and climatic phenomena such as El Niño and La Niña (which may occur periodically). Similarly, socioeconomic and geographical overlapping conditions lead to a changing (spatiotemporal) climate state depending on the time scale analyzed (years or months), referred to as climate variability, which is highly dependent on the amount and distribution of precipitation (Miller MX, 2020; Vide, 1996; Prats, 2006).

In some countries, such as Colombia, there is a tendency to confuse low air temperatures (<10°C) in certain cities (e.g., Bogotá, Tunja, Manizales, among others), located above 2,000 meters above sea level (masl), with a winter climatic season. This assumption is incorrect, as the climate in mountainous areas is typically and directly associated with the principle that, for every 100-meter increase in altitude (some authors refer to a thermal gradient of 180 meters), the ambient temperature drops approximately

1°C or 0.6°C in humid conditions. This establishes an adiabatic dry and humid rate. However, altitudinal positioning determines that, at elevations between >900 masl and 1,700 masl, air temperatures range from 18°C to 24°C. Between 1,700 masl and 2,500 masl, air temperatures are between 14°C and 18°C, while, at altitudes above 2,500 masl, air temperatures vary between 0°C and 14°C (Lopez, 2012; Prats, 2006).

Regarding climate variability, considering the fluctuating set of climatic conditions involves integrating determining factors and interactions of climatic order within physical and geographical contexts, which show variations over time and space scales. Thus, modifications in the interactions among components of the climate system (atmosphere, terrestrial surface, oceans, ice-covered land areas, biosphere, and human activity) are caused by temporal climate variations over short periods (years or months) or relative to its average state (highly dependent on the amount and distribution of precipitation), known as climate variability (Pabón, 1998; Montealegre, 2000; Izaguirre, 2010; García, 2007; Ruíz, 2009).

The tropical zone, influenced by climate variability, is characterized by developing countries with pronounced issues of poverty, public health, and monoculture practices. Likewise, they have extensive forest areas and changing biogeographic, climatological, and edaphic conditions, among others (Vargas, 2010; FAO, 2000). The above represents a significant contribution (although customs, traditions, food, and consumption habits also play a role) of humidity due to climatic effects. Therefore, precipitation, air temperature, and relative humidity in the solid waste generated in a population or city of a tropical country exceed 70%, particularly in Latin America and, notably, in Colombia.

Potentially Usable Waste in Tropical Countries

Traditionally, in tropical countries, the comprehensive management of urban solid waste involves transporting the waste to a controlled final disposal site, where it can be utilized and valorized. However, concepts of sustainable production and consumption emphasize the inclusion of elements such as waste minimization, responsible consumption, and cleaner production of solid waste. Currently, based on this approach, there is a paradigm shift from a linear economy (resource extraction, production, distribution, consumption, and waste). This linear economy involves extracting resources to produce goods, with waste generated both during production and by the end consumer, often disposed of primarily through technologies like final disposal in sanitary landfills. For this reason, the goal is to transition from a linear economy to a circular economy (production, distribution, consumption, reuse, recycling). In other words, the circular economy focuses on recycling, improving, and redesigning products, alongside implementing technologies to reduce waste and ultimately eliminate waste generation in consumption and production processes. The aim is to reduce environmental pressure in various ways, enhance social welfare, and increase efficiency in industrial production. (Stubbs, 2008; Sandoval, 2020; Castañeda e. a., 2019; Castex, 2018).

In the conventional analysis of urban solid waste, its characteristics vary across municipalities or cities, influenced by climate variability and traditions based on dominant activities (industrial, commercial, or tourism-related). Similarly, population customs, such as rhythms, habits, food preferences, consumption patterns, and meteorological conditions, contribute to variations in solid waste characteristics. The above highlights the need for essential classification of solid waste by type, including organic, non-usable, special, hazardous, inorganic, or potentially usable waste. Depending on the origin of solid waste, it can be classified as urban, industrial, commercial, agricultural, radioactive, mining, sanitary, construction and demolition, forestry, and livestock. According to the producing source, it can be categorized as residential, commercial, street sweeping, special, institutional, industrial, marketplaces, and supermarkets. Regarding solid waste management, it can be classified as urban, special, hazardous, and hospital (Sandoval et al., 2020).

In terms of solid waste generation, as previously mentioned, its independent variables include customs, traditions, economic income, climate, and the demographics of populations or human settlements, which, due to their anthropogenic activities, produce solid waste. Its dependent variables include per capita generation, the number of dwellings, productive, institutional, industrial, and commercial activities, and the number of inhabitants (residential) in the study area.

Temporary storage and presentation are particularly important due to source separation practices through the classification of containers and/or bags by color. In Colombia, this classification is governed by GTC 24 and Resolution 2184 of 2019 which provide guidelines for separation by type of solid waste. It is also important to highlight that specialized vehicles should be available for selective or differentiated collection (micro-routing) of potentially usable solid waste. These vehicles have a smaller capacity compared to those traditionally used and are essential in a locality or municipality with an appropriate production centroid (Rondón Toro, 2016).

A form of temporary storage in localities, municipalities, or cities for potentially usable solid waste includes classification and utilization stations or sorting and preparation facilities. In Colombia, these are known as Classification and Utilization Stations for Solid Waste (ECAS). These stations represent an evolution from storage warehouses to a consolidated infrastructure, technically designed with engineering criteria and economic efficiency. This process is facilitated by a solidarity economy involving formalized recyclers who specialize in separating potentially usable solid waste. In essence, these ECAS play a significant role in the separation and storage of inorganic solid waste within the value chain. This type of waste, whether separated by generators (a process requiring optimization) or during the transfer of the solid waste route, holds substantial value for utilization and valorization within the integrated waste management process. What is unacceptable is disposing of waste in a sanitary landfill, dumping inorganic and organic solid waste into surface water bodies, on vacant lots, properties, or simply in the streets.

There should be recycling plants or recovery facilities suitable for initiating the transformation of potentially usable solid waste based on its product line: plastic, glass, paper, cardboard, ferrous and non-ferrous metals, fabrics, etc. In other words, an expanded recycling model (transformation of inorganic solid waste) should be integrated into the value chain, where an energy-efficient balance is achieved between unprocessed raw materials and recycled raw materials. This aims to incorporate these materials into the production of goods, the distribution chain, and the end-user cycle. By doing so, greenhouse gas emissions, negative environmental impacts, and energy consumption related to obtaining virgin raw materials are gradually reduced. The above establishes significant valorization in the process of utilizing potentially usable solid waste as recycled raw material, thus promoting effective use within production cycles through the circularity of inorganic solid waste.

It is worth noting that the integral management of solid waste (GIRS) is conceptualized at the municipal level, while the organizational scale addresses the comprehensive management of solid waste (MIRS). The latter involves defining the roles and responsibilities of all stakeholders involved in the generation and management of solid waste, collaboratively establishing procedures, resources, challenges, needs, and sustainable solutions in a creative and cooperative manner with a shared goal. This goal is to manage solid waste in a way that aligns with environmental concerns and public health. It considers the responsibilities of subscribers, communities as a whole, sanitation service providers, and the formulation and implementation of municipal policies alongside relevant programs. Furthermore, it seeks to establish adequate institutional and municipal or local capacity for organizing a sanitation service aligned with an integrated solid waste

program and local, regional, and national development plans. At the organizational level, it is appropriate to consider harmonization with strategic planning instruments, mission, and vision (MVCT, 2012; CEPAL, 2016).

According to the above, the normal cycle involves generation, temporary storage or presentation, collection, transportation, and controlled final disposal, typically in controlled sanitary landfills—that is, burying potentially usable solid waste. However, it is essential to establish a virtuous cycle that incorporates sustainable or responsible production and consumption, minimization, cleaner production in productive activities, and, importantly, the maximum valorization and utilization of potentially usable solid waste. Accordingly, the integral management of solid waste, especially in tropical countries, must include verifiable nuances of utilization and valorization of potentially usable solid waste.

A Bit about Circular Economy, Circular Business, and Orange Economy

The circular economy originates from industrial ecology and is designed to integrate environmental and social sustainability into economic development based on the principles of cleaner production and a functional service economy. This involves the causal relationship between production and consumption systems, promoting efficiency and effectiveness in the use of materials, water, and energy. It extends to the circular use of material flows and the prolongation of useful life through the implementation of technological innovation and the promotion of circular business models grounded in sustainable development (ELLEN McArthur Foundation, 2014; MADS, 2019).

In this way, the circular economy transitions to an industrial economy focused on intentional preservation. This model employs renewable energy, minimizes the use of toxic chemicals, eliminates waste through careful and appropriate design, and promotes sustainable consumption. It channels public and private investments that ultimately drive economic growth (Oliveira, 2017; Castañeda e. a., 2016). The circular economy can be considered a paradigm due to the diversity of strategies oriented toward sustainability and the comprehensive analysis of the production chain, the use of products, goods, and services. Therefore, the circular economy is implemented in organizations to promote long-term economic sustainability (Burgo et al., 2019). The above includes elements of a cycle that can be closed through a business model with a strong emphasis on environmental sustainability (Tchobanoglous & et al, 1998; Agudelo M, 2020; Banco Mundial, 2018).

Additionally, the circular economy describes an economic system based on business models that replace the end-of-life concept with reduction, reuse, recycling, and recovery of materials within production, distribution, and consumption processes. Similarly, it operates at both micro and macro levels to achieve sustainable development, create environmental quality, foster economic prosperity, and promote social equity for the benefit of current and future generations (Haas, 2015).

Regarding the above, the circular economy may face a lack of user interest and awareness, compounded by factors such as corporate culture. This challenge can become pressing when analyzing its implementation, particularly in sectors that exhibit significant resistance to change. Furthermore, the design of value propositions for circular systems of products and services requires greater depth, particularly addressing the lack of guidance for integrating circularity into the design of products and services, especially within the framework of eco-consumption and user engagement (Campos, 2003; Banco Mundial, 2018; Lamprea M, 2017; Cervi, 2011).

The circular economy is characterized as an approach to economic development with a specific purpose of protecting the environment and gradually reducing pollution. This approach facilitates, among other actions, sustainable economic development. The circular economy is regarded as an appropriate and decisive strategy aimed at reducing the input of virgin materials and the output of solid waste by closing economic loops, reverse cycle

networks, and ecological elements of resource flows (Balboa & Domínguez, 2014). When implemented, the circular economy will generate balanced benefits for both the economy and society. These benefits focus not only on the responsible use of the environment but also on reducing essential natural resources used in productive sectors and economic activities. At the same time, the foundation of this economy is rooted more in physical aspects than in purely economic observations (Andersen, 2007).

It is important to establish that a business model based on the valorization of potentially usable resources or inorganic solid waste can generate opportunities that benefit the waste separation sector or recyclers in a balanced manner. Currently, conventional business models are not being effectively developed due to the heavy exploitation of natural resources to carry out their activities or produce their products, leading to environmental, social, and economic impacts on recycler organizations operating under such models. The integration of potentially usable resource waste into a sustainable business model can incorporate elements such as value creation and organizational strengthening. Sustainability demands new sources, approaches, and methods to generate value propositions. Value creation is approached on a network scale rather than being exclusively organization-centered. Value delivery considers all stakeholders involved, including nature and society, without focusing solely on customers or economic profits (Kiely, 1999; Tchobanoglous & et al, 1998).

Circular business models facilitate a more circular economy by contributing to the deceleration and closure of resource flows. The product value extension business model is a type of circular business model that plays a role in slowing down resource flow. Existing circular economy approaches have identified key common strategies: stock optimization, eco-efficiency, waste reduction, and the 4R strategy as primary methods to achieve a circular economy. The creative, or orange, economy establishes a significant framework for the development of creative industries and cultural initiatives. For the creative, or orange, economy to act as an activator of a country's economy and market, it must, at its core, foster innovative, entrepreneurial, and application-driven elements, ideally incorporating technological processes. These efforts should align with the principle of protecting intellectual property rights and aim to transform creative ideas into cultural or creative goods and services. (Vieira, 2020; Figueiredo, 2019; Maulina, 2019; Parshukova, 2021; Mikhaylova, 2021; Boccella, 2016)

In general, the creative (orange) economy can be classified into cultural industries, publishing, and visual arts. It also encompasses movement, ecotourism and tourism, gastronomy, cultural traditions, and handicrafts. The latter refers to the utilization of potentially usable resource materials from areas of influence for the valuable transformation of artisanal expressions specific to a region, incorporating elements of environmental sustainability through the use of inorganic solid waste that is easily moldable and valorizable (Miguez, 2007; Bendassolli, 2009; Runco, 2015; Dziedzic, 2016).

The orange and/or creative economy should evolve from reactive environmental management (corporate resistance to fully comply with environmental regulations until legally compelled) to responsible environmental management (leveraging relevant environmental information to make decisions and fully comply with current environmental regulations) in specific sectors such as ecotourism, handicrafts, or cultural industries. This evolution involves applying techniques such as product line analysis, which is similar to life cycle analysis but offers a broader analytical spectrum by incorporating economic and social aspects. It emphasizes congruence, prevention, and precaution in terms of gradually reducing negative environmental impacts (Segura, 2024).

Creative Economy (Orange) and Its Applications in Handicrafts

When delving into certain sectors of the circular economy, the physical characteristics (particle size, size distribution, density or specific weight, and moisture content) and chemical characteristics (physical analysis, melting point, energy content, and calorific value) must be considered. These factors are significant for selection and incorporation into the production cycle, ensuring better utilization within the production of goods, services, or finished products. The above defines a circular business model within the orange economy, as it lays the foundation for organizations to create, deliver, and capture value through closed material cycles or potentially usable resource solid waste, which serve as the basis for product production. This model includes circular supplies, waste recovery, product life extension, shared platform use, and the consideration of the product as a service.

According to the above, considering strategies for the efficient and effective inclusion of potentially usable inorganic solid waste presents a viable opportunity to close reverse cycle networks. This involves designing systems that eliminate waste, incorporating technical components for reuse, increasing system recovery capacity, and ultimately providing a service to the user. In the production cycle — or rather, sustainable production — (considering raw materials, waste, manufacturing, processing, and recovery, along with eco-design and industrial symbiosis), sectors such as ecotourism, handicrafts, or cultural industries would experience favorable impacts. These include reducing raw material consumption (from renewable and non-renewable natural resources), lowering production and marketing costs, and fostering product, goods, or service innovation in terms of sustainable consumption (eco-consumption, reuse, preparation for reuse, and the collaborative economy). All of this is achieved with a genuine sense of sustainability that benefits businesses and organizations, leading to noticeable improvements in the quality of life for adjacent populations while reducing environmental effects on public health, energy consumption, biodiversity, ecosystems, and the surrounding environment.

Therefore, this circular business model, designed within systems and/or cascades in the orange economy—particularly in sectors like sustainable tourism, handicrafts, or cultural industries in developing countries—would align with Sustainable Development Goals (SDGs) 1, 2, 3, 7, 8, 9, 11, 12, 13, 14, and 15. Additionally, it can drive economic growth through net savings in raw material substitution costs, value creation, job creation, and systematic eco-innovation. Other benefits include a significant increase in productivity and competitiveness, profit generation, reduced volatility, development of new corporate services, enhanced customer interaction, improved quality and price reduction of products or services, relocation of activities at the local level, significant reductions in obsolescence, better environmental health prevention, reductions in greenhouse gas emissions, minimized negative externalities, and increased supply security through raw material strategies.

Creative Economy (Orange) and Applications in Sustainable Tourism

Tourism related to activities undertaken by individuals, involving stays or trips outside their usual residence for purposes such as business, study, or leisure, represents significant aspects of an industry intrinsically tied to the economy. Therefore, for the creative and/or orange economy—considering the various productive units and sectors linked to operators and the generation of goods or services, or a combination thereof—tourism is a grouping of production and consumption activities that originate on-site from the movement of people (Francesch, 2004; Acerenza, 2006).

According to the above, tourism, analyzed from various perspectives, is a social phenomenon based on a set of interrelations and temporary as well as spatial movements driven by anthropogenic and socioeconomic needs distinct from the usual environment. This has a direct relationship with entirely socio-environmental aspects, especially in host or tourist destinations, which have

demonstrated evolution and resilience in response to economic factors, pandemics, leisure practices, spiritual or intellectual needs (e.g., professional studies), use of free time, market changes, business, and environmental services within the territory where tourism develops. A consolidated tourism system comprises components such as demand, supply, geographical space, and market operators, creating a synergy of elements that converge through interactions among diverse socioeconomic actors (Castro, 2021; WTO, 2010; Theobald, 1994; Truitt, 1991).

The different types of tourism, classified based on their activities, can be categorized by their origin (international, national, export), their economic involvement (mass or massive, active, passive, alternative, conventional, specialized, affinity-based, medical), leisure modality (adventure, ecological or alternative, agrotourism or rural, experiential, ethno-tourism, gastronomic, professional, religious), volume (minority, mass, individual, selective, group), type of travel (independent, permanent, itinerant, residential), and nature (youth, social, green, sustainable) (Acerenza, 2006; WTO, 2010; Theobald, 1994).

Sustainable tourism must achieve a balance between the economic, political, and ecological dimensions of the area where the activity takes place and, naturally, incorporate an ethical and social perspective for the benefit of adjacent communities. Sustainability, when applied and demonstratively associated with tourism, has been subdivided into various forms such as ecotourism, green tourism, rural tourism, community tourism, fair tourism, solidarity tourism, ethnic tourism, responsible tourism, environmentally friendly tourism, wildlife tourism, among others. However, at its core, these types of sustainable tourism aim to reduce adverse effects on ecosystems, manage natural resources effectively, maximize the benefits of tourism, and seek a sustainable balance between this anthropogenic activity and the environment where it occurs. This is achieved through planning and environmental strategies that promote harmony with the environment, social use, pollution reduction, optimization of green areas, and the adaptation of natural spaces. The goal is to ensure compatibility and appropriate utilization of the ecological, cultural, and social value of the adjacent area (Khoshnevis, 2017; D' Arco, 2021; Grilli, 2021; Aly, 2021; Tiago, 2021).

Accordingly, the circular business model applied in the orange economy, designed within systems and/or cascades—especially in sectors such as sustainable tourism and its various forms—establishes direct and inversely proportional relationships with the type (internal, receiver, or emitter) and categories (internal, national, and international) of tourism and the physical (geographical) environment or space where tourism develops. In this context, the exploitation of environmental goods and services in the host or tourist destination (geographical space) of a specific natural resource entails adverse environmental effects. These effects arise from factors such as the cohesion or disintegration caused by the intersection of tourist supply and demand, infrastructure interventions, intensive utilization of physical space, demand flow, ecosystem modifications, climate influence (in tropical countries, linked to climate variability), and the limited capacity for self-recovery of the territory and its environmental assets. These challenges can exceed the touristic carrying capacity (environmental carrying capacity and, by extension, the biophysical and social capacity of the environment relative to anthropogenic activity) in the area where tourism is developed (Castillo, 2019; Castañeda et al., 2020; McIntosh, 1990; Swarbrooke, 1995; Winston, 1992; Peñaranda et al., 2019).

This circular business model can be envisioned where cohesion and mitigation of the impact exerted by tourism on the geographical space generate an integrated utilization of potentially usable resources, incorporating them into the production cycle of goods and services provided by tourism operators as added value in the sustainable

circular business framework. This is regarded as a successful derivation aligned with SDGs 8, 12, and 14. Sustainable tourism adopts an integrated approach to develop processes that enable tourism growth without degrading or depleting nearby natural resources. In other words, it focuses on preserving geographical spaces and conserving adjacent ecosystems. This entails the confluence of economic, ecological, and sociocultural sustainability within the framework of tourism development in a specific area, emphasizing the implementation of tourist routes that primarily support community development (Astudillo, 2020; Meneses, 2020; Peñaranda et al., 2020; Manning, 1996).

In tropical countries, economic factors, demand units, randomness, marketing systems, production systems, and exogenous or uncontrollable physical factors such as demographics, economic development, political situations, security, and climate play a role. Climate, in particular, can influence sustainable tourism development and affect the system itself, especially in tourist areas impacted by climatic phenomena. These include regions with intertropical convergence and variability in meteorological conditions, such as high relative humidity, atmospheric pressure, winds, precipitation, and air temperature, among others. The overlapping geographical and socioeconomic conditions promote the dynamic nature of the climate in these geographical spaces where tourism develops. Consequently, this generates implicit negative impacts on the relationship between tourism supply and demand, as tourism markets become highly vulnerable to seasonal changes, environmental risks, and prevailing climatic conditions in the demand area for tourism (Kropinova, 2021; Andries, 2021; Streimikiene, 2020; Elnasr, 2021).

Thus, the circular business model for sustainable tourism in tropical countries considers a comprehensive analysis of biotic and abiotic factors influencing sustainable tourism. These include ecogeographic, landscape, geomorphological, and climatic characteristics, which interact with one another through the environmental relationships embedded in the tourism development area. If analyzed as a system within the framework of a geographical, environmental, and ecological space, it considers the interrelations, adaptations, and limitations of the physical space, location, environmental and ecosystem services, and the climatic factors influencing the area where all sustainable tourism is developed. That is, recognizing the importance of ecosystems for human well-being, restoring deteriorated ecosystems, and implementing low negative environmental impact actions to achieve a significant, analytical, and balanced understanding of the social phenomenon of sustainable tourism, especially within the framework of circular businesses in the creative or orange economy (Altinoz, 2021; Zhang et al., 2019; Scott, 2021).

Conclusions

In tropical countries, where climatic, socioeconomic, and environmental conditions are particularly distinct in terms of the type and quantity of solid waste potentially usable, the various creative and/or orange economy initiatives—particularly handicrafts and sustainable tourism—and the potential of circular businesses within the circular economy have a high likelihood of success. This success is oriented toward the utilization and valorization of inorganic or potentially usable waste. In other words, the inclusion of the materials cycle in the value chain of handicrafts and sustainable tourism represents a viable alternative to reduce production costs for finished products, goods, or services related to these activities. It generates a sustainable and circular activity, presenting an effective and efficient corporate opportunity within the Latin American framework.

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