Sustainable Development in East Asia

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4 Sustainable consumption and production as a challenge to sustainability in East Asia

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Introduction

Nowadays, along with the progressive development of humanity, accompanied by a dynamic increase in consumption (resulting, on the one hand, from the growing level of prosperity and, on the other, from the quantitative growth of the world's population) and a simultaneous increase in the production of goods for which demand is constantly rising, the issue of more rational and sustainable consumption and production (SCP) is gaining particular importance. Meeting these growing needs is, unfortunately, inextricably linked with the increasing exploitation of natural resources and the degradation of the environment. Recognising these processes and the challenges they entail – not only of a strictly environmental nature but also social and economic – the United Nations (UN), in its Sustainable Development Goals (SDGs) adopted in 2015, identified the necessity of striving for SCP as one of the 17 priority goals for humanity for the following decade, that is, Goal 12: "Ensure sustainable consumption and production patterns" (UN, 2015). This goal assumes above all the minimisation of the extraction and use of natural resources, the reduction of waste and emissions throughout the life cycle of manufactured goods, and the improvement of human development and well-being. In this context, it is hardly surprising that there has been a rise in interest and in the number of scientific studies and publications on SCP (Geels et al., 2015), including those focusing on East Asia (Schroeder et al., 2017). This region, due to its population and the unprecedented economic growth recorded in recent decades (Falkowski, 2024), faces challenges of unsustainability just as strongly as Europe or North America.

This chapter aims at an in-depth analysis of SCP in East Asia (ASEAN Member States, China, Japan, and the Republic of Korea – ASEAN plus 3). It is worth noting that the overwhelming majority of existing research on SCP in fact concerns so-called WEIRD societies (Western, Educated, Industrialised, Rich, Democratic). Therefore, the undertaking of SCP issues in East Asia – in countries that clearly cannot be classified as WEIRD – constitutes an extremely important and desirable attempt to fill the existing gap in this field.

In this chapter, the author seeks to answer the following research questions: What actions are East Asian countries undertaking in favour of SCP? What is the level of

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implementation of the SCP concept in East Asia? What are the main problems and challenges for SCP in East Asia?

The search for answers to these research questions is intended to allow the verification of the research hypothesis, according to which East Asian countries are undertaking a number of actions to achieve SCP, recognising their significance and necessity in the face of the environmental, social, and economic challenges associated with the dynamic development of the entire region. The effects in this respect are, however, varied, which results, among other things, from the existing differences between East Asian countries stemming from their levels of development, as well as differences in the ecological awareness of their societies.

The structure of this chapter is subordinated to the research questions posed and to its main objective. Following a brief introduction, the chapter begins with a synthetic discussion of selected fundamental theoretical aspects of SCP, in particular explaining the concept and essence of SCP. It then discusses the positive and desirable impact of SCP on the process of so-called decoupling, that is, the disconnection of economic growth from environmental degradation. The next section presents, in a synthetic manner, the process of the growing importance of sustainability in the area of consumption and production in the international arena, resulting in the elaboration by the UN of the aforementioned Goal 12 within the SDGs, namely, "Ensure sustainable consumption and production patterns". This is followed by a discussion of selected key actions undertaken in favour of SCP in particular East Asian countries, and subsequently a focus on the level of implementation of the SCP concept in these countries, with attention paid to the scope of similarities and differences in this respect. To this end, the method of hierarchical cluster analysis – Ward's method – was employed, and the analysis covered the years 2000–2025. The following part of the chapter discusses selected problems and challenges for SCP in East Asia. The chapter concludes with a summary containing the basic findings and recommendations.

Concept and essence of SCP

The concept of SCP has its origins in economic theory. Both the notion of consumption and that of production must be regarded as fundamental issues within the economic sciences, which study the process of human economic activity.

The notion of consumption may be defined as the process of satisfying specific human needs, in which goods and services are ultimately utilised by people (consumers) (Laibson, 2001). Thus, consumption as a macroeconomic category is considered to be the final phase of the economic process; in other words, it lies at the end of the chain of economic activities that begins with the assessment of available resources and subsequently passes through the production of goods and services and their distribution to the final recipient.

The expansive development of humankind, entailing an increase in consumption and thereby also the production of goods necessary to satisfy the growing demand, unfortunately takes place in a highly unsustainable manner. This compels global discussion on the need to promote and implement sustainable actions both in

consumption and in production. Consequently, sustainable consumption and sustainable production are gaining ever greater significance.

Sustainable consumption draws upon the achievements of environmental economics, which emerged from the integration of natural sciences with social sciences, particularly economics. Environmental economics is based on the paradigm of neoclassical economics, which assumes that the human being (*homo oeconomicus*), although egoistic by nature, nevertheless acts rationally, striving to achieve maximum individual and social satisfaction (Hussen, 2018). The same assumption underlies the definition of sustainable consumption, since it presumes that consumers are capable of making rational decisions, provided they have information on the consequences of their choices. In this context, the phenomenon of scarcity (limitedness) of resources is of particular importance, as it compels consumers to make rational choices while also taking sustainability into account. In managing resources that are in short supply, the consumer must constantly make decisions concerning their allocation. These decisions are often associated with the hierarchisation of individual needs and the renunciation of less important ones in the name of a higher value (Hussen, 2018).

A particularly important environmental aspect of sustainable consumption is highlighted by J.H. Spangenberg (2014), who argues that all consumer choices freely made in accordance with the principle of sustainability take place within the available decision-making space of the individual, defined on the one hand by specific social objectives, and on the other by environmental goals.

It is also worth recalling the definition of sustainable consumption proposed by J. Moisander and S. Pesonen (2002), who define it as consumption whose form and scale are determined by a set of ecological values and attitudes of consumers, leading to so-called green awareness and a responsible process of market decision-making that takes environmental and social aspects into account. Accordingly, under this approach, sustainable consumption is that which reduces the scale of waste of both resources and finished products, as well as diminishing existing environmental damage.

In a similar vein, Mittelstaedt et al. (2014) define sustainable consumption as the pursuit of minimising the negative effects of the consumption of goods and services, both consumer and investment-related, through conscious, rational, and optimal utilisation of production factors, as well as the reduction of waste and the environmental pollution thereby generated.

In defining the concept and essence of sustainable consumption, it is also appropriate to recall the distinction between its two basic types according to G. Seyfang (2011), namely weak and strong sustainable consumption. Weak sustainable consumption primarily involves the transformation of consumption towards greater rationality and efficiency (particularly in terms of the use of limited resources) at various levels, especially the environmental, against the backdrop of an overall increase in consumption. Strong sustainable consumption, in contrast, is based on the postulate of a general reduction in consumption, requiring consumers to renounce consumption at the present level in favour of future generations. Complementing this concept, Lorek and Spangenberg (2014) associate weak

sustainable consumption with energy-saving behaviours and the promotion of consumption of energy- and material-efficient products with low emissions and pollution impacts. Strong sustainable consumption, on the other hand, they equate with a culture of simplicity, involving the absolute reduction of the total level of unsustainable consumption, rather than merely the improvement of material or energy efficiency. In the literature, it is generally held that strong sustainable consumption appears to be a postulate that will be extremely difficult to put into practice (Mont & Plepys, 2008; Tukker et al., 2010; Lorek & Fuchs, 2013).

Production, meanwhile, is understood in economics as the totality of activities aimed at supplying goods and services to the market in order to satisfy specific consumer needs of society. These activities may be understood very broadly, ranging from the extraction (acquisition) of necessary materials to the sale of the final good (Kurz & Salvadori, 2000).

Sustainable production, like sustainable consumption, draws to a large extent on the achievements of environmental economics (Hussen, 2018). It may be defined as a way of producing goods and services that, at every stage of the production cycle and the product life cycle (resource acquisition, product design, production method, packaging, distribution, and disposal), takes ecological and social aspects into greater account than previous or conventionally applied methods, while emphasising the particular importance of limiting the negative impact of the production of goods and services intended to meet human needs on the economy, society, and the environment (Zwiech, 2023).

Veleva and Ellenbecker (2001), in defining sustainable production as the creation of necessary goods and services, stress that it should be carried out by means of processes and procedures that are free from pollution, efficient in terms of energy and natural resource use, economically viable, safe for workers, communities, and consumers, and socially and creatively beneficial for all stakeholders. Sustainable production is defined in a similar spirit by Lebel and Lorek (2008) as well as Wiles and Watts (2014).

In discussing sustainable production, Veleva and Ellenbecker (2001) pointed to several fundamental principles applicable to the processes and procedures of producing goods and services if these are to be sustainable in economic, environmental, and social terms. These principles include, inter alia: (i) products and services should be manufactured so as to be safe and environmentally friendly throughout their life cycle; (ii) waste and environmentally unfriendly by-products should be reduced, eliminated, or recycled; (iii) energy and materials should be conserved, and their types optimally matched to the intended production purposes; (iv) chemicals, physical factors, technologies, and work practices that pose a threat to human health or the environment should be systematically limited or eliminated; (v) workplaces should be designed so as to minimise or eliminate physical, chemical, biological, and ergonomic hazards; (vi) work should be organised in a way that fosters the preservation and development of employees' efficiency and creativity, respecting their subjectivity; and (vii) the safety and well-being of all workers should be a priority, as should the continuous development of their talents and skills.

The concept of sustainable production corresponds closely with the concept of the circular economy (Antonioli et al., 2022; Stahel & MacArthur, 2019). It may be defined as an economic system aimed at minimising waste and maximising resource use by keeping products and materials in use for as long as possible. This approach is the opposite of the traditional linear economy, based on the "take–make–use–dispose" scheme (Glöser-Chahoud & Schultmann, 2025). Liu (2012), in defining the circular economy, adds consumer aspects to production-related ones, arguing that it is a model of production and consumption based on sharing, borrowing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible. In this way, the product life cycle is extended and the amount of waste is, by design, reduced to a minimum, which brings economic, social, and environmental benefits.

It is also worth underlining the utility and practical dimension of the concept of SCP. According to Ecological Modernisation Theory (EMT), the concept of SCP constitutes a key programme for operationalising "eco-rationality" in the economy and society. The theory assumes that existing institutions – the state, the market, science, and civil society – are able to internalise environmental objectives through technical innovations, regulatory reforms, and new forms of co-governance, so that economic modernisation leads to the systematic reduction of environmental pressure (Mol & Spaargaren, 2000). In this sense, SCP is a set of mechanisms through which this internalisation actually occurs along value chains: on the production side through eco-design, life cycle management, and closing material loops, and on the consumption side through the standardisation of the environmental quality of goods, green public procurement (GPP), and the shaping of infrastructural conditions for everyday practices (Spaargaren, 2003). EMT interprets these actions as a transition from "end-of-pipe control" to prevention and the systemic reconfiguration of production and service processes and thus as a source of "innovative regulatory compensations". As a result, SCP becomes a tool for decoupling economic growth from resource use and emissions, which will be discussed later in this chapter.

To summarise, it is worth emphasising that in line with the concept of sustainable development, SCP are defined as the conscious use of products and services that meet basic needs and improve quality of life, while at the same time minimising the use of natural resources and toxic materials, as well as emissions of waste and pollutants throughout the life cycle of a product or service, so as not to endanger the needs of future generations (Dubey et al., 2016).

As is clearly evident from the above review of definitions and approaches to SCP, sustainable consumer behaviour may in fact be related to the awareness of the long-term consequences of individual consumption behaviours for the natural or social environment, and it is often described with words such as responsible, environmentally friendly, or socially friendly consumer behaviour (Carrington et al., 2010).

There is no doubt that sustainable patterns of consumption and production can provide economies, in the long term, with tangible competitive advantages and reduce the scale of poverty, and in a broader context ensure sustainable development,

which justifies the necessity of incurring certain inconveniences and higher costs in the short term (Subramanian & Gunasekaran, 2015; Huang et al., 2012).

Impact of SCP on decoupling

SCP may play a key role in achieving the so-called decoupling, that is, the separation of economic growth from environmental degradation (the negative effects of human economic activity on the natural environment) (Hickel & Kallis, 2019). This is one of the fundamental assumptions of sustainable development, according to which the economy can grow without the necessity of increasing the consumption of resources and without worsening the state of the environment. In other words, GDP growth need not be synonymous with a rise in the consumption of materials, energy, water, or other resources, while at the same time the economy can develop without increasing air, water, or soil pollution, or without damage to nature such as deforestation or the loss of biodiversity of plant and animal species (UNEP, 2011).

The aforementioned impact of SCP on decoupling may take place either through the separation of resource use from economic growth (GDP) (resource decoupling), or through the separation of environmental pressure (impact decoupling) (Parrique et al., 2019). Resource decoupling occurs when the economy generates increasing added value (GDP), but the growth rate of physical resources (raw materials, energy, water) rises more slowly than GDP or even declines. Impact decoupling, by contrast, occurs when the economy increases GDP, while the negative environmental impacts (e.g. CO_2 emissions, air pollution, toxicity, ecosystem degradation) grow more slowly or decrease. Thus, in the case of resource decoupling we may ask: "How many tonnes of raw materials are required to generate one unit of GDP?", whereas in the case of impact decoupling the relevant question is: "What size ecological footprint is associated with this production and consumption?" Figure 4.1 illustrates the impact of SCP on the scale and extent of both resource decoupling and impact decoupling.

SCP may also influence the "scale and degree" of decoupling. In this context, a distinction should be made between: (i) relative decoupling and (ii) absolute decoupling (Wiedenhofer et al., 2020). In the case of so-called weak relative decoupling, the negative environmental impact grows more slowly than GDP (though it still grows). In practice, this will mean the use of fewer raw materials per unit of economic growth thanks to appropriate sustainable production measures. In the case of so-called strong absolute decoupling, in which GDP rises while the level of environmental degradation declines (including through the absolute reduction of resource use), it is essential to apply not only sustainable production principles but also sustainable consumption practices. From the perspective of achieving the SDGs, absolute decoupling is particularly desirable, since it leads by definition to a total, and not merely relative, reduction of the negative impact of human economic activity on the environment.

The effective achievement of decoupling, both relative and – particularly importantly – absolute, will not be possible without the consistent undertaking of a

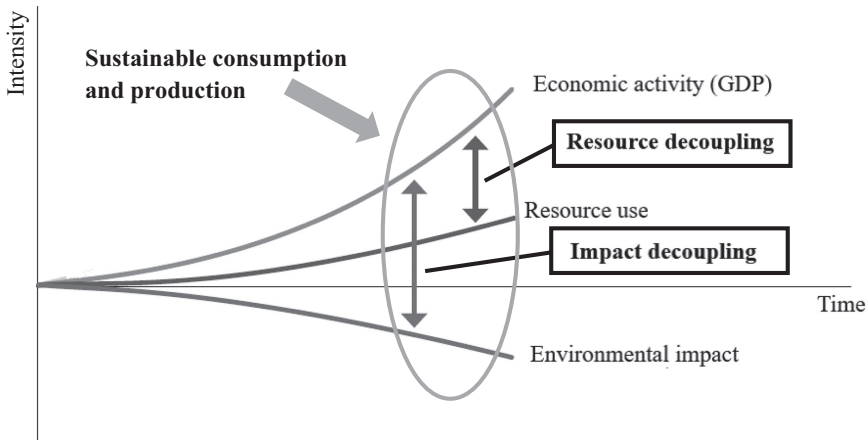

Figure 4.1 SCP vs. decoupling.

Source: Own study based on UNEP (2011).

range of SCP measures. Table 4.1 presents selected actions in this field along with an indication of their potential impact on decoupling.

Undoubtedly, the path to achieving absolute decoupling is neither easy nor straightforward. It requires the simultaneous addressing of a range of market, infrastructural, regulatory, and also behavioural barriers. Only the harmonisation of legal regulations, the creation of price incentives, full transparency of supply chains, investment in circular economy infrastructure, and consumer education can translate into the permanent separation of economic growth from resource consumption and environmental pressure. Thus, it is difficult to imagine this without SCP in human activity.

One of the indicators of the degree of degradation of the natural environment is greenhouse gas emissions. If, therefore, as a measure of decoupling, we adopt the indicator *Carbon intensity of GDP* (albeit with certain reservations) (Vogel & Hickel, 2025), which shows how many greenhouse gas emissions (in kg CO_2e) are attributable to each unit of GDP produced in dynamic terms (over the years 1990–2022), then we may identify those countries in which there is a high probability of decoupling occurring, as well as those where there is clearly no separation of economic growth from environmental pressure (Figure 4.2). In the case of East Asian countries, where the phenomenon of decoupling is observed, only in Japan can we speak of the existence of absolute decoupling. In the remaining countries of this group, relative decoupling occurs (the economy grows faster than emissions/resource use), with China as a prominent example.

It is self-evident that the measures undertaken to promote SCP in all East Asian countries, which will be discussed later in this chapter, may play an important role in achieving not only relative decoupling but ultimately also

Table 4.1 Actions through which SCP drives decoupling

SCP-related actions	*Effect on decoupling*
Material efficiency design (eco-design, lightweighting, modularity)	Lowers the *material-intensity-per-GDP* ratio. This supports *relative decoupling* immediately and when scaled across an economy can underpin *absolute decoupling*
Circular economy loops (reuse, remanufacturing, high-quality recycling)	Cuts demand for virgin resources and dampens the rebound between GDP growth and primary extraction
Extended Producer Responsibility (EPR)	Creates a financial incentive to design products that last, are easy to repair, and are easy to recycle – shrinking waste flows while value added keeps rising
Demand-side behaviour shifts (sharing platforms, leasing, "product-as-a-service")	Generates more service revenue with fewer physical goods, a classic route to *service-sector decoupling*
Digital substitution (streaming, cloud storage, virtual meetings)	Dematerialises consumption, reducing tonnes of material per dollar of GDP
Benign-by-design substitution (non-toxic or abundant materials)	Even when mass remains constant, the *quality* of environmental pressure drops (less toxicity, lower embodied carbon)
Material or carbon pricing (resource taxes, border-adjusted levies)	Changes relative prices so that GDP can expand without a parallel increase in resource throughput or emissions

Source: Own elaboration.

absolute decoupling in these countries. In this case, however, a profound transformation of East Asian economies would be absolutely necessary, particularly in terms of changing the energy mix (greater use of renewable energy sources), reducing material-intensive consumption, and altering existing consumption patterns.

SCP as one of the sustainable development goals

The concept of SCP has matured over recent decades in international discourse as a response to the growing tension between the progressive, dynamic economic development of humanity (driven by globalisation) and the intensifying environmental and social constraints associated with this development. Already in the Brundtland Report, *Our Common Future* of 1987, reference was made for the first time to the inconsistency of consumption and production patterns (especially in highly developed countries) with the long-term sustainability of socio-economic development (World Commission on Environment and Development, 1987). The Brundtland formula – emphasising the necessity of changing the quality of growth and resource consumption patterns, including energy – gave SCP the status of one of the main vectors of the transition from "end-of-pipe control" to prevention throughout the life cycle of goods and services.

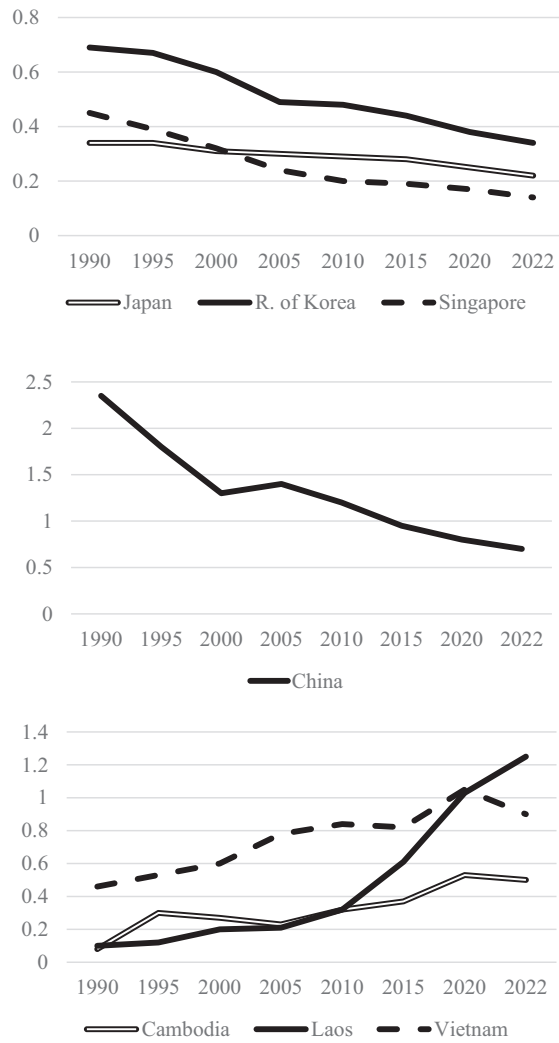

Figure 4.2 Carbon intensity of GDP in East Asia in the years 1990–2022 (kg CO_2e per constant 2015 US$ of GDP).

Source: Own elaboration based on World Bank (2025).

In the subsequent document *Agenda 21*, an action plan for sustainable development adopted at the Earth Summit (UNCED: United Nations Conference on Environment and Development) in Rio de Janeiro in 1992, the necessity of "changing consumption and production patterns" was explicitly indicated as a programme of action combining demand- and supply-side instruments, and the

crucial role of public policies and education in building awareness of the inevitability of active measures for the sustainable development of humanity was underlined (UN, 1992).

Following this, the "Oslo Definition" of 1994 gave internationally recognisable content to the notion of sustainable consumption – satisfying needs and quality of life while minimising the consumption of resources, toxic materials, and emissions throughout the life cycle – integrating the concepts of decoupling, Life Cycle Assessment, and well-being (UNESC, 1994).

In the Plan of Implementation of the Johannesburg Summit (UN, 2002), the international community was called upon to develop the so-called 10-Year Framework of Programmes (10YFP) to accelerate the transition to SCP. This call initiated the so-called Marrakech Process (2003–2012) – a multilateral cycle of work under the auspices of UNEP (United Nations Environment Programme) and UN DESA (Department of Economic and Social Affairs (United Nations)), within which SCP evolved from a collection of good practices into a coordinated set of instruments (GPP, consumer information, food systems, construction, tourism).

An institutional breakthrough occurred during the United Nations Conference on Sustainable Development, held in Rio de Janeiro from 20 to 22 June 2012, exactly 20 years after the 1992 Earth Summit. In the final document of this conference, *The Future We Want*, states adopted the aforementioned 10YFP and embedded it as a formal framework for cooperation (UN, 2012). Implementation was entrusted to the One Planet network – a network of six programmes (Sustainable Public Procurement; Consumer Information; Sustainable Lifestyles and Education; Sustainable Food Systems; Buildings and Construction; and Sustainable Tourism), which to this day form the "connective tissue" of SCP policies and the implementation base of SDG 12.

In the parallel process of formulating new development goals for the years 2015–2030, the Open Working Group (2013–2014) proposed Goal 12: "Ensure sustainable consumption and production patterns", which the UN General Assembly adopted a year later by approving the so-called 2030 Agenda (UN, 2015). Thus, nearly 30 years after the problem was first signalled in the Brundtland Report, the process of conceptualising and institutionalising the notion of SCP was finalised.

It should be emphasised that the concept of SCP expressed in SDG 12 plays a dual role: both as a goal and as a horizontal mechanism of coherence for the entire 2030 Agenda. Goal 12: "Ensure sustainable consumption and production patterns" refers not only to tasks in the field of consumption and production, the implementation of which is essential for ensuring the sustainable development of humanity in the contemporary world, but also to the principles and tools for measuring changes in this area, including the growing pressure on resources resulting from increasing demand for a wide range of goods.

In UN terms, this goal covers the full life cycle of goods (from resource extraction, through design, manufacturing, and use, to waste) and has a horizontal character: its indicators and instruments permeate other goals (e.g. climate, health, biodiversity). Formally, SDG 12 consists of a set of targets that operationalise "SCP": implementation of the 10-Year Framework of Programmes on Sustainable

Consumption and Production Patterns (10YFP) (12.1); sustainable management and efficient use of natural resources (12.2); halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains (12.3); environmentally sound management of chemicals and all wastes throughout their life cycle (12.4–12.5); encouraging companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (12.6); promoting public procurement practices that are sustainable (12.7); ensuring that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature (12.8); supporting developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production (12.a); developing and implementing tools to monitor sustainable development impacts for sustainable tourism (12.b); and rationalising inefficient fossil-fuel subsidies (12.c). This construction explains why SDG 12 functions as a "coupling" mechanism between industrial, consumer, and environmental policy at the global level (UN, 2024).

Actions for SCP in East Asia

There is no doubt that the current level of public awareness of the necessity to undertake concrete measures towards SCP, as well as the willingness to bear the tangible costs and inconveniences associated with such measures in East Asia, remains highly uneven. This is clearly visible, for instance, in eating habits and the readiness to change them, as well as in the acceptance of higher production costs (and thus prices) for more sustainable products. The situation in this regard differs dramatically across East Asia, being significantly more advanced in Singapore or Japan compared with Myanmar or Cambodia (ASEAN Committee on Consumer Protection, 2022).

Naturally, this is conditioned by various economic or socio-cultural factors (particularly difficult to modify in the short term). Nevertheless, the relatively low level of public awareness in the region crucially determines the fact that any real progress towards SCP in East Asia depends above all on strict regulations (including EPR – Extended Producer Responsibility), specific economic incentives, broad public awareness campaigns concerning the existing challenges and threats in this field financed from public resources, and strong international (including regional) pressure. With this in mind, at the regional level, ASEAN (Association of Southeast Asian Nations) has implemented, among others, the *Framework for Circular Economy for the ASEAN Economic Community* (2021) and the *ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States (2021–2025)*, both of which establish a shared vision of transformation towards SCP and a list of priorities in this area (ASEAN Secretariat, 2021; ASEAN Secretariat & World Bank, 2021).

Of course, specific SCP-oriented measures are being undertaken in each East Asian country. The undisputed leaders in this respect are Japan, South Korea, and Singapore. In Japan, since the late 1990s, an institutionalised SCP system has been

established, based mainly on sector-specific legislation, for example, in the management of containers and packaging, household appliances, and food waste: the *Containers and Packaging Recycling Law* (1995), the *Home Appliance Recycling Law* (2001), the *Food Recycling Law* (2001), and the *End-of-Life Vehicle Recycling Law* (2005). Data indicate that thanks to these regulations, between 2007 and 2018, the amount of collected and processed plastic waste increased by 3.1 kg per capita and PET (Polyethylene Terephthalate) bottles by 0.49 kg per capita. By 2022, PET recycling had exceeded 80%, a substantial proportion of which constituted so-called thermal recycling, that is, incineration with energy recovery (Ishimura, 2022). Another notable example is the effectiveness of the *End-of-Life Vehicle Recycling Law*, as a result of which the recovery rate currently exceeds as much as 95%.

It is also worth mentioning Japan's *Sound Material-Cycle Society* (SMCS) policy, which constitutes a long-term, legally established strategy of moving from the "take–use–dispose" model to a 3R economy (reduce, reuse, recycle) throughout the product life cycle. Its basis is the *Basic Act on Establishing a SMCS* (2000), which obliged the government to prepare approximately every 5 years a *Fundamental Plan for Establishing a SMCS* with clearly defined objectives and indicators (including resource productivity, material-cycle indicators, and the volume of final disposal) (Ministry of Environment, Government of Japan, 2000).

So far, five such plans have been adopted – in 2003, 2008, 2013, 2018, and 2024. The latest, the fifth *Fundamental Plan for Establishing a Sound Material-Cycle Society* (2024), regards the circular economy as a strategic response to the challenges of climate, biodiversity, and pollution, while simultaneously serving as a lever of Japan's competitiveness. It introduces a "full life cycle" approach and deepens cooperation between the so-called arterial industries (production) and venous industries (collection, recycling) to enhance sustainable resource circulation in the economy and to stimulate demand for sustainable products within Japanese society (OECD, 2025). Consequently, on the production side, it compels the design of more durable and easier-to-dismantle products and the use of secondary raw materials, while on the consumption side – through public procurement criteria and selective collection systems – it increases demand for circular solutions and facilitates citizen participation in resource circulation. In this way, it perfectly aligns with the implementation of SCP.

South Korea has also been a leader in East Asia in implementing the concept of SCP since the 1990s. It has successfully developed a comprehensive and effective SCP system that combines legal regulations, economic instruments, and public education. The cornerstone of the Korean system is the *Act on the Promotion of Saving and Recycling of Resources* (1992), which introduced EPR. As a result, producers and importers must finance the collection and recycling of designated materials and products (packaging, electrical equipment, batteries, tyres) (KEI, 2016). In 1995, South Korea introduced a special Volume-Based Waste Fee System, under which citizens are required to purchase designated bags for mixed waste. This is assessed as having increased residents' motivation to separate and reduce waste (ADB, 2024). In addition, since 2005, the landfilling of biowaste has been prohibited.

Combined with compulsory separate collection, this has led to a recycling rate of more than 90–95% of food waste – mainly into compost, feed, and biogas (ADB, 2024). This makes Korea a global leader in the management of biowaste. Furthermore, the Korean government introduced the *Framework Act on Resource Circulation* (2018), aimed at reducing dependence on primary raw materials and increasing the share of recyclates in the economy. Within the framework of this act, the *Resource Circulation Performance Management System* was also established, monitoring large enterprises in terms of resource efficiency (KEI, 2016).

Singapore, in turn, implements SCP through a coherent package of regulations and incentives covering the entire life cycle of products, both on the production and consumption sides. Its core is the *Resource Sustainability Act* (2019), which introduced EPR for e-waste, mandatory reporting on packaging as a step towards EPR for packaging, and requirements for the separation, treatment, and reporting of food waste in designated buildings (Government of Singapore, 2019). On the consumption side, Singapore has introduced specific price-based incentives: a fee for single-use carrier bags (minimum 5 cents from July 2023 in large retail chains) and, from 1 April 2026, a deposit return scheme for beverage containers. In its *Zero Waste Masterplan* (2019), Singapore set two primary goals: an overall recycling rate of 70% and a 30% reduction in waste sent to the country's only landfill – Semakau – by 2030. It is also noteworthy that, thanks to the measures undertaken by the Singaporean government, daily per capita waste generation decreased from 1.08 kg in 2013 to 0.88 kg in 2023. Moreover, in 2023, Singapore's overall recycling rate reached 52%, with plastics at 5% and food waste at 18% following the introduction of new requirements in this area (NEA, 2025).

China, too, recognises the necessity of actions towards SCP. It must be remembered that this is the world's largest producer of goods and the fastest-growing economy. It is therefore no surprise that China faces serious environmental problems, such as the depletion of non-renewable resources and the growing pace of pollution generated by its vast population (in particular CO_2 emissions) and waste.

China's SCP policy is built on the framework of the circular economy. Its foundation is the *Circular Economy Promotion Law* (2008), which integrates resource efficiency and the 3Rs (reduce–reuse–recycle) into industry, services, and public administration (Su et al., 2013). As in Japan or Singapore, China also introduced in 2016 a special plan for the implementation of EPR aimed at increasing sustainability across the production process – from design to end-of-life – particularly in electronics and batteries (Jiang et al., 2023). Regarding sustainable consumption, the Chinese authorities are actively shaping consumer demand. Among other initiatives, they are developing GPP programmes as well as green/low-carbon consumption policies. In addition, wide-ranging campaigns have long been conducted on product labelling and incentives for households, designed to encourage more conscious and sustainable consumer choices. As a result of these measures, improvements have been observed in the energy and material efficiency of consumption, while GPP measurably reduces emissions intensity and generates demand for circular products (Li & Cao, 2021; Cao et al., 2022). It is also worth noting that in 2022, the *Implementation Plan for Promoting Green Consumption*

was adopted, addressing daily consumer practices in order to further foster sustainable consumption in Chinese society (Huang et al., 2023).

An important pillar of China's SCP system is the *Law on the Prevention and Control of Environmental Pollution by Solid Wastes* (1995, most recently revised in 2020), which introduced mandatory separation of municipal waste and the principle of "reduction, resource utilisation, and harmlessness" in waste management, while also finalising the phase-out of waste imports (the so-called National Sword) (Brooks et al., 2018). Since 2019, moreover, 16 Chinese cities have been implementing the *Zero-Waste City* Pilot Programme (Meng et al., 2021).

Thailand pursues SCP based on two complementary pillars: the horizontal *Sustainable Consumption and Production Roadmap 2017–2036* (with six implementation sectors and an SDG 12 monitoring system) and the special development agenda *Bio-Circular-Green (BCG) Economy Action Plan 2021–2027*, which links circular economy measures with the innovation-oriented "Thailand 4.0" transformation (Office of Natural Resources and Environmental Policy and Planning, 2017; BCG Policy Board, 2021).

In implementing SCP, the Thai authorities use a combination of demand- and supply-side instruments. The *Green Public Procurement Promotion Plans*, in place since 2008, are assessed as relatively effective in creating a market for "green" products (Mungkung et al., 2021). At the level of material streams, key measures focus on the management of plastic waste. In this respect, the *Roadmap on Plastic Waste Management 2018–2030* has been established. At the same time, eco-industrial towns/parks are being developed in Thailand. However, their functioning still leaves much to be desired (Maolanont & Pochanart, 2023). Importantly, Thailand has not yet managed to prepare and adopt a *Waste Electrical and Electronic Equipment Act* based on EPR, as has been done in other East Asian countries.

Malaysia builds its SCP policy on three main pillars: (i) environmental and waste legislation, (ii) a circular economy strategy, and (iii) demand-side instruments for consumers and the public sector. The starting point was the *National Sustainable Consumption and Production Blueprint 2016–2030*, which incorporates, among other elements, Government Green Procurement (GGP) as a path to increasing demand for "green" products and the *Circular Economy Waste System* as a means of moving away from landfilling reusable materials (EPU, 2016). In 2019, Malaysia adopted the *National Cleanliness Policy 2020–2030*, which, among other provisions, called for the prompt implementation of EPR – without which sustainable production is difficult to imagine.

Malaysia's strong emphasis on SCP is also evidenced by the adoption, in 2024, of the *Circular Economy Blueprint for Solid Waste in Malaysia 2025–2035*, which systematises waste management transformation. This document outlines a vision of transitioning to a circular model in the *sisa pepejal* (solid waste) sector, emphasises maximising resource efficiency and minimising waste generation, and declares the sector's contribution to the "net-zero" goal by 2050 (Teo & Seow, 2025). To coordinate implementation at the national level, the government established the *National Circular Economy Council (NCEC)*, tasked with integrating the actions

of ministries and public and private stakeholders, including the implementation of the Blueprint in cities. The Malaysian authorities expect that these measures will enable the swiftest possible transition to a circular economy, thereby contributing significantly to the practical implementation of SCP.

Vietnam, like other East Asian countries, is also taking measures towards SCP. This is evidenced by the adoption, in 2020, of the *National Action Programme on Sustainable Production and Consumption 2021–2030*, which includes improving resource efficiency, promoting sustainable demand patterns, and building a circular economy. Particularly important for SCP implementation is the *Law on Environmental Protection* (2020), which introduced in Vietnam EPR for producers of packaging, electrical and electronic equipment, batteries/accumulators, and vehicles, together with mechanisms for contributions to a fund and/or in-house recycling. In addition, mandatory separation of domestic solid waste at source was introduced – enforceable from 1 January 2025 – in order to increase recycling and reduce landfilling (Tran et al., 2025; Nguyen & Vu, 2024). A significant element of Vietnam's SCP efforts is also its regulations on plastics, particularly plastic waste, which represents a huge challenge for the country. In this area, the *National Action Plan for Management of Marine Plastic Litter by 2030* was adopted, with targets to reduce plastic inflows to the seas by 50% by 2025 and 75% by 2030, alongside restrictions on single-use plastics (World Bank, 2022). Moreover, the Vietnamese authorities are promoting so-called green growth. In 2021, they adopted the *National Strategy on Green Growth for the 2021–2030 Period, with a Vision to 2050*, which legitimises green consumption and green production.

The implementation of SCP is also reflected in the actions of Indonesia, which is likewise striving to introduce circular economy principles, establish a waste management system (including plastics), and promote education to change consumption patterns among its citizens. To this end, Indonesia has adopted, among others: the *National Policy and Strategy on Household Waste Management 2017–2025*, the *Roadmap for Waste Reduction by Producers*, and the *National Action Plan on Marine Debris 2017–2025* (UNDP, BAPPENAS, Royal Danish Embassy, 2021).

The Philippines has taken similar steps, adopting the *Ecological Solid Waste Management Act* (2000) and the *Extended Producer Responsibility Act* (2022), which obliges large enterprises to meet annual "plastic footprint" recovery targets ranging from 20% (2023) to 80% (from 2028 onwards), together with a reporting and auditing system (Gue, et al., 2022). The Philippine authorities also aim to implement SCP through GPP, as set out in the *Philippine Green Public Procurement Roadmap* (2017). It must be noted, however, that the Philippines faces major difficulties in achieving the adopted SCP targets, which poses a significant challenge.

Certain actions towards SCP have also been undertaken in other East Asian countries, namely Brunei, Cambodia, Laos, and Myanmar. The most important include: in Brunei – the *Economic Blueprint: Towards a Dynamic and Sustainable Economy* (2021), in Cambodia – the *Cambodia's Roadmap for Sustainable Consumption and Production 2022–2035* (2022), in Laos – the *SCP Roadmap 2022–2025 with Vision to 2030* (2023), and in Myanmar – the *Myanmar Sustainable Development Plan 2018–2030* (2018). Importantly, the ambitious plans contained

in these documents, which largely replicate the measures adopted in other East Asian countries, have encountered major difficulties, mainly due to a lack of stable financing and weak enforcement of the legal solutions introduced. Consequently, these countries remain at the very beginning of the path towards SCP in comparison with others in the region.

In conclusion, all East Asian countries are undertaking measures for SCP, reflected in the strategies and programmes they adopt, which demonstrates that the environmental challenges associated with the region's dynamic economic growth have been properly recognised. A comparison of these actions indicates that particular emphasis is placed on implementing circular economy principles, managing plastic waste effectively, expanding EPR, promoting sustainable consumption through green public procurement (GPP), and educating societies to change purchasing habits towards greater sustainability. At the same time, significant differences in the effectiveness of SCP measures can be identified across the region. In this respect, the achievements of Japan, South Korea, and Singapore are incomparably greater than those of other countries. The level of development of each society and its existing environmental awareness also play a significant role in this context.

SCP in East Asia – level, scope of similarities and differences

The implementation of the SDGs adopted by the UN General Assembly in the 2030 Agenda in 2015 (UN, 2015) is highly uneven across East Asia. Nevertheless, in as many as 16 out of the 17 SDGs, the region has recorded improvements relative to the 2015 baseline. The one SDG in which the situation has unfortunately deteriorated significantly is Goal 13: *Climate action*. With regard to Goal 12: *Ensure sustainable consumption and production patterns*, some progress has been achieved, although it has been the smallest compared with the degree of implementation of the other SDGs (UN, 2025). This clearly demonstrates the scale of challenges in this area that East Asia must face. The greatest problem for the region appears to be the unsustainable use of natural resources (UN, 2025). By contrast, the greatest progress in the past decade has been achieved in corporate sustainable practices, which may testify to an increased awareness among entrepreneurs of the need for sustainable business practices, as well as to the growing effectiveness of legal and institutional measures undertaken in the region in the SCP field. This must be assessed positively, since without such changes it is difficult to expect real and lasting advances in sustainable production.

If we look at the implementation of the main assumptions of SDG 12 from the perspective of individual East Asian countries, it becomes clear that the leaders in this respect are three highly developed countries: Japan, South Korea, and Singapore. On the other hand, the clear outsiders in terms of SCP are Myanmar and Cambodia. It is also worth highlighting the steadily improving situation in China, which is characterised by the largest scale of consumption and production in East Asia – a consequence of the country's size and its dynamic socio-economic development (UN, 2025).

Similar conclusions can be drawn from our own analysis of the similarities and differences between East Asian countries in terms of SCP. For this purpose, the Ward method was applied. This method is one of the techniques of hierarchical cluster analysis. Its primary aim is to group the analysed entities into clusters in such a way that the entities within clusters are as similar as possible, while the differences between clusters are maximised (Murtagh & Legendre, 2014).

For the present analysis, the most recent available data for each of the eight indicators used to assess SDG 12 in East Asia, derived from the Sustainable Development Solutions Network (SDSN) database, were employed. These indicators are presented in Table 4.2.

Based on the results obtained using the Ward hierarchical clustering method, three clusters of countries can be distinguished in terms of their level of SCP (Figure 4.3). The first cluster (cluster A) – high-production-footprint economies – consists of Myanmar, Cambodia, Indonesia, the Philippines, Vietnam, Laos, and China. These countries are generally characterised by: (i) high resource intensity, particularly in the construction, mining, and coal-based energy sectors; (ii) a predominance of high-emission industries (steel, cement, coal); (iii) a lack of developed recycling systems – with the majority of waste ending up in landfills; and (iv) so-called production at home, which means that environmental pressures and associated costs are not externalised but generated and borne domestically.

The second cluster (cluster B) – transitional economies – includes Thailand, Malaysia, Brunei Darussalam, and the Republic of Korea. This cluster is internally much less resource- and emission-intensive compared to Cluster A, but compensates with a higher import footprint and the highest export levels of plastic waste in East Asia. In other words, these economies are halfway towards a circular economy model. They have the necessary legal frameworks and partly developed waste and circular economy infrastructure, but still displace part of their environmental pressures abroad. In relation to the countries in Cluster B, it can be said that they are in transition between traditional resource-intensive economies and circular economies. Success in this transition will only be genuine if the reduction of domestic environmental pressure goes hand in hand with limiting imported emissions and

Table 4.2 Indicators used by SDSN to assess SDG 12

Indicator code	*Indicator name*
sdg12_msw	Municipal solid waste generated per capita (tonnes per capita)
sdg12_ewaste	E-waste generated per capita (kilograms per capita)
sdg12_pollprod	Pollution embodied in domestic production (kilograms per capita)
sdg12_pollimp	Pollution embodied in imports (kilograms per capita)
sdg12_nprod	Material footprint of domestic production (tonnes per capita)
sdg12_nimport	Material footprint of imports (tonnes per capita)
sdg12_explastic	Plastic waste exported as percentage of domestic plastic waste generated
sdg12_mswrecycl	Municipal solid waste recycling rate (%)

Source: Own elaboration based on SDSN (2024).

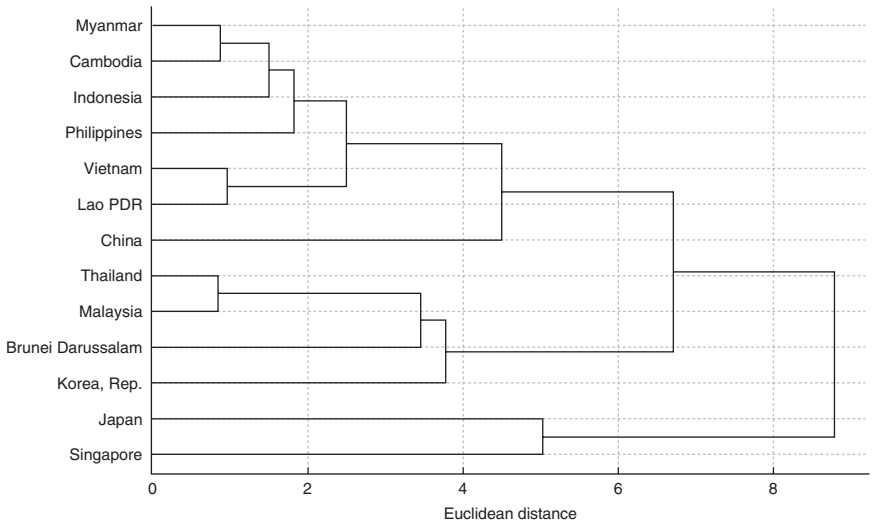

Figure 4.3 Hierarchical clustering of East Asian countries on SCP.

Source: Own elaboration.

materials, as well as truly closing the waste loop rather than relocating it abroad, mainly to developing countries with weak regulations.

In turn, the third cluster (cluster C) – import- and consumption-driven economies – comprises Japan and Singapore. Both countries share an import-driven footprint. Although technologically advanced and locally relatively "clean", they remain heavily dependent on resource imports and the emissions embodied in goods brought in from abroad. In other words, both Japan and Singapore have locally achieved a high level of pollution control and reduction, largely by externalising resource and emission pressures to the countries from which they import goods and services. The key challenge here is therefore the dematerialisation and decarbonisation of their supply chains. Without this, full implementation of SDG 12 is difficult to envisage.

In summary, cluster A generates environmental pressure (negative environmental impacts) primarily within its own borders, cluster C largely externalises it abroad, while cluster B balances between these poles. There is no doubt that progress towards responsible, SCP across the entire East Asian region requires addressing simultaneously both the material footprint of domestic production per capita and the material footprint of imports per capita, as well as raising the municipal solid waste recycling rate in the weakest economies of the region. Only then can the successful achievement of SDG 12 be expected.

Main problems and challenges for SCP in East Asia

In East Asia, the implementation of the concept of SCP encounters numerous significant barriers, both structural and socio-economic. The accelerated economic

growth observed since the beginning of the 21st century – and, as a consequence, not only rapid industrial development but also faster urbanisation and increased consumption driven by the rising purchasing power of societies in this region – has inevitably led to a sharp rise in environmental pressures. Existing patterns of urban consumption, especially in the largest and most populous countries of the region, namely China, Indonesia, and the Philippines, but also in the wealthiest countries – Singapore and Japan (characterised by substantial imports of goods with a high material footprint (UNSD, 2023)) – generate high ecological footprints and emissions of harmful gases into the atmosphere, including CO_2. Measures taken to date have focused primarily on combating air pollution rather than on reducing unsustainable consumption (Zhao & Schroeder, 2010). As a result, such actions should be regarded as ad hoc and of limited effectiveness in terms of providing a genuine and lasting solution to the problem.

An important determinant – and simultaneously a future challenge – lies in the strong institutional barriers in East Asia. On the one hand, central authorities in these countries have indeed prepared and introduced actions to promote SCP. On the other hand, their effectiveness is often curtailed by conflicts of interest between central and local levels, by the economic dependence of regions on heavy industry, and by weak enforceability of regulations. This frequently leads to ambitious political decisions meeting strong resistance or being implemented selectively, which significantly reduces their effectiveness. This problem affects virtually the entire region and is particularly evident in China.

Another major challenge in East Asia is not only the coordination of institutional efforts for joint, regional SCP initiatives – since such efforts on the international stage have in recent years been evident from governments and state administration bodies – but primarily their implementation in practice. This refers both to the actions of enterprises, especially private ones, in favour of sustainable production, as well as households, in favour of sustainable consumption. The root of this problem lies in significant social and cultural differences, as well as in the varying levels of environmental awareness among societies in different East Asian countries (Shao, 2019).

As shown by the data presented in Figure 4.4, the environmental awareness of societies in East Asia varies greatly. It is highest in Japan, South Korea, and Singapore, and lowest in Myanmar, Cambodia, and Laos. Interestingly, across East Asia, climate change is much more widely perceived as a serious threat than environmental degradation resulting from the dynamic development of human activity in the region. If we look at individual countries, the greatest difference in the percentage of people perceiving climate change as a considerably greater threat than general environmental degradation occurs in China and Laos.

Undoubtedly, the level of environmental awareness in East Asian societies is a strong determinant of SCP. At the same time, in countries with low awareness it represents a major challenge. This is also because many people lack sufficient knowledge about the consequences of their consumption choices or do not believe in the effectiveness of individual actions (the "lack of agency" barrier), which discourages change towards more sustainable consumption. Of course, this problem is not confined to East Asia but is of a global nature (Kim & Lee, 2023).

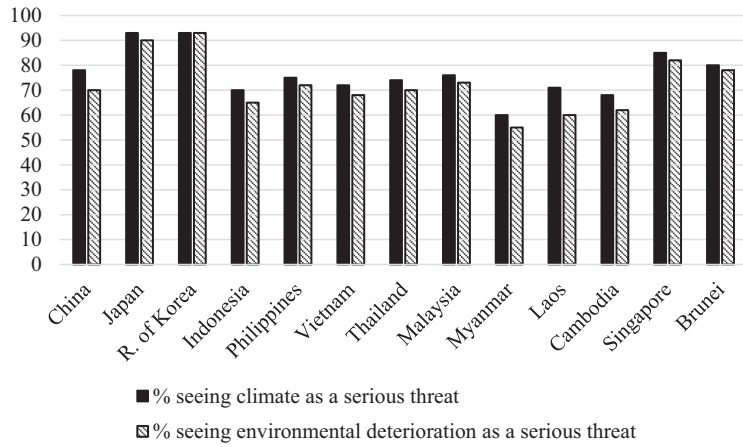

Figure 4.4 Environmental awareness in East Asia.

Source: Own elaboration based on Yale Program on Climate Change Communication (2023).

Another crucial determinant – and simultaneously a challenge – for SCP implementation in East Asia is economic in nature, including the real disposable income of households. Although eco-friendly solutions such as energy-efficient devices, environmentally friendly products, or renewable energy sources are gradually being developed in East Asia, their higher initial cost means that many households cannot afford them. This, for obvious reasons, significantly hinders and slows down the implementation of eco-friendly solutions. Furthermore, more sustainable production of goods often entails higher costs, which are then reflected in higher prices, reducing consumer demand. This weakens the incentive for businesses to adopt sustainable production methods.

When considering economic factors in the context of SCP, attention should also be drawn to the prevailing model of economic development in most East Asian countries – a model based on strong and rapid industrialisation, export-oriented expansion, and the building of competitive advantages in industrial sectors. This model, while enabling high rates of economic growth and social modernisation, has simultaneously entrenched energy- and material-intensive economic structures. This developmental path, which these countries naturally wish to pursue further, undoubtedly constitutes and will continue to constitute a significant challenge for SCP in the future. It must be remembered that the prevailing conviction in East Asia of the inevitability of further economic growth fosters the development of a consumption-based model, with China as the prime example (Falkowski, 2025).

Finally, mention should also be made of socio-cultural factors. In East Asia, consumption and production practices are deeply "embedded" in culture – in group norms, Confucian values, the notion of face (*mianzi*), networks of relations (*guanxi*), and local social capital. This means that consumer choices and business

strategies are not determined solely by rational economic calculation but are strongly shaped by social relations, community expectations, and moral traditions that have organised daily life in the region for centuries. In this sense, the socio-cultural background is as significant as legal regulations or market incentives for sustainability. It ultimately determines whether new patterns – from recycling to low-emission practices in tourism – are perceived by East Asian societies as consistent with the "social order" or as alien and difficult to accept, thereby creating a natural and powerful barrier to the effective adoption of SCP practices.

It should also be borne in mind that in developing countries where the standard of living has increased significantly in a relatively short time (as in many East Asian states), in the era of globalisation and the spread of shared social status models, material and consumer values often dominate as symbols of status. This makes behavioural changes towards sustainability more difficult. Societies in such countries increasingly wish to consume more – and can increasingly afford to do so. This phenomenon is not foreign to East Asia. Material aspirations, driven by rapid economic growth and strong status-related pressures, naturally fuel demand for durable goods, processed food, and mass tourism. In the context of SCP, this creates a tension: on the one hand, improving quality of life and consumption opportunities is a legitimate developmental goal; on the other, it increases the risk of entrenching high-emission, waste-generating models. As a result, it significantly affects the effectiveness of SCP measures in the region.

In summary, although numerous actions are being undertaken in East Asia in favour of SCP, the process faces many obstacles – ranging from political and institutional, through economic, to socio-cultural. Only a holistic approach – combining education, financial support, systemic reforms, and changes in social values – can enable an effective transformation of the region towards a more sustainable model.

Concluding remarks

The analysis of SCP in East Asian countries makes it possible to formulate several key conclusions of a synthetic and cross-cutting nature. Firstly, the research results unequivocally confirm the thesis advanced in the introduction, namely that the countries of the region are undertaking numerous measures to implement the SCP concept. However, their effectiveness and the scope of implementation differ depending on the level of economic, institutional, and socio-cultural development. The ongoing processes of modernisation and economic growth, particularly in China and other developing states of the region, generate, on the one hand, significant opportunities for the introduction of innovative solutions in the field of sustainability, while on the other hand they result in strong environmental pressures, the consequences of which are felt both locally and globally.

Secondly, the clustering results indicate the existence of three groups of countries with distinct paths towards implementing SDG 12. The first comprises high-emission and resource-intensive economies (including China, Vietnam, Indonesia), which generate environmental pressures mainly within their own borders. The second group includes transitional countries (e.g. South Korea, Malaysia),

where elements of progress coexist with a persistent reliance on externalising environmental costs. The third group consists of highly developed import- and consumption-driven economies (Japan, Singapore), which are characterised by relatively high domestic efficiency but remain heavily dependent on imports of resources and emissions embedded in global supply chains.

Thirdly, despite positive trends in the implementation of corporate and institutional practices, SCP in East Asia continues to face numerous barriers – economic, political-institutional, and socio-cultural. The development model of the region's economies, largely based on rapid industrialisation and export-oriented expansion, perpetuates an energy- and resource-intensive structure. Moreover, the growing material aspirations and status-driven consumption in the societies of dynamically developing countries constitute an additional factor hindering transformation towards more responsible patterns.

In light of the above, it seems necessary to formulate several recommendations that may contribute to the more effective implementation of SCP in East Asia: (i) strengthening legal regulations and their enforcement – it is essential to ensure coherence between central policies and local implementation. Instruments based on EPR, as well as rigorous waste and emission regulations, may play a particularly important role; (ii) developing the circular economy – priority should be given to closing material and energy loops, especially in countries with the highest material footprints. This includes both the improvement of recycling systems and the reduction of externalising environmental costs (e.g. through plastic waste exports); (iii) dematerialisation and decarbonisation of supply chains – particularly for highly developed countries such as Japan and Singapore. Further progress in the implementation of SDG 12 will depend on transforming global value chains towards lower resource and emission intensity; (iv) raising public awareness – lasting changes in consumption patterns require wide-ranging educational activities to foster responsible consumer choices. Socio-cultural conditions in the region must be taken into account, along with efforts to overcome barriers resulting from status-related pressures and material aspirations; (v) enhancing regional cooperation – given the strong economic and environmental interconnections among East Asian countries, it is crucial to develop common political and institutional frameworks. Initiatives such as the ASEAN Circular Economy Framework should be intensified and supplemented by joint monitoring mechanisms; and (vi) financial and technological support – in the economically weakest countries (Myanmar, Cambodia, Laos), solidarity-based mechanisms are needed, including technology transfers, financial assistance, and capacity-building programmes.

In conclusion, it may be stated that East Asian countries stand today at a crossroads: on the one hand, they possess considerable modernisation and institutional potential; on the other, they remain deeply embedded in a development model based on intensive resource exploitation. Success in implementing Goal 12 of the 2030 Agenda will only be possible if economic, socio-cultural, and political barriers are addressed simultaneously. This requires a holistic approach combining systemic reforms, public education, international cooperation, and innovative circular economy mechanisms. Only under such conditions will East Asia be able to

make a genuine contribution to the global transformation towards more sustainable models of consumption and production.

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