

UNECE

White Paper

**Technical Application
of Business Standards for
Sustainable Tourism**

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1. Introduction

The rapid growth of international tourism is remarkable. The 2016 Annual Report of the United Nations World Tourism Organization (UNWTO) says that international tourist arrivals reached 1,235 million in 2016, the result of a continuous growth of around 4 per cent a year during the past seven years. Tourism is one of the most rapidly growing business domains and will, inevitably, need to make use of the most advanced technologies available at this time to accommodate the needs of this growing market.

There are four related business standards for sustainable tourism including with (1) Global Sustainable Tourism Council (GSTC), (2) International Standardization Organization (ISO) 21401:2018, (3) ISO/technical Committee (TC) 228, and (4) United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Green Paper on Sustainable Tourism. After the Green Paper on Sustainable Tourism – Experience Programs was published by UN/CEFACT in April 2019, the working experts of Travel and Tourism domain found it necessary to develop the business standards for sustainable tourism. This white paper suggested ten categories according to the service content or products provided by the tourism sectors, including the core sectors, such as food and restaurant, accommodation, transportation, destination, shopping, entertainment, tour agency, local government, experience program and traveler.

And the concept of United Nations Sustainable Development Goals (SDGs) will be and should be well considered in development of business standards for sustainable tourism. Necessary data on sustainability information will surely be communicated between trading parties, which necessitates new business data.

In achieving the SDGs by 2030, this document discussed the sustainable planning and actions pertaining to the core services provided in tourism sectors. It is expected that more discussion on business standards of sustainable tourism can serve as a reference to foster the feasibility of building a future electronic exchange system database.

2. Purpose and scope

The SDGs do not list sustainable tourism as a standalone goal. However, several of the SDGs are applicable to the tourism industry. The definition of tourism industry is "the sum of the industrial and commercial activities that produce goods and services wholly or mainly for tourist consumption." (Weaver and Lawton, 2002, p.471). The main sectors are travel agencies, tour operators, transportation, accommodation, food services, attractions, entertainment, and specialized merchandise (Weaver, 2006).

Tourism, both global and regional, can have severe impact on local communities, natural resources, climate, and economies. Tourism being linked to travel, there is also a link to sustainable travel and transportation. Globally, we see the realization in the tourism industry, leading to believe that changes are necessary to not only meet the demands of local communities to be able to receive tourists, but also to utilize tourism for achieving a positive impact on those communities. With support of business standards, it should be possible to differentiate sustainable and non-sustainable tourism. Business standards can assist buyers of tourism products and services to make choices with a certain amount of confidence that what they buy is regarded as sustainable.

This project is aimed to produce definitions and guidelines on sustainable tourism. While it is not intended to deliver a certification system, it provides elements upon which certification or labeling systems could be built. The project will not only deliver components of future recommendations to government to facilitate, promote sustainable tourism in their constituencies but also will take into consideration work which has been produced by UN/CEFACT on Experience Programs, being a subset of sustainable tourism

products. The use of these documents and relevant lists developed in the project will surely be made available to any system developers to trade sustainable tourism.

The sustainable tourism of business standards should be revised in response to environmental, societal, and policy changes in the future, and the comparability of revised versions should be also taken into consideration, to allow for the cross-reference of sustainable tourism standards to be easily carried out between different versions for maintaining the internal quality consistency of the indicators. Particularly, to develop a pilot and foresight of rating system for sustainable tourism.

In addition, there are many future opportunities, challenges, and risks in setting global sustainability standards including with (1) centralized unique ID challenges, (2) multi-layer packaging travel product challenges, (3) centralized data storage challenges, (4) expose of detail sustainability information, (5) unified chapter and verse system, and (6) supply chain challenges.

3. Related business standards for sustainable tourism

3.1 Global Sustainable Tourism Council

The GSTC establishes the global standards for sustainable travel and tourism, known as the GSTC criteria. The criteria include two sets: the destination criteria is for public policymakers and destination managers (the latest version released in 2019), whereas the industry criteria is for hotels and tour operators (the latest version released in 2016). The criteria are arranged in four pillars, sustainable management, socioeconomic impacts, cultural impacts and environmental impacts. The latest version of destination criteria is updated to correspond to the 2030 Agenda for Sustainable Development and the 17 SDGs that it most closely relates to.

3.2 ISO 21401:2018

ISO/TC 228 released the international standard ISO 21401 in 2018 — sustainability management system for accommodation establishments. This document has been drafted to help accommodation establishments of all sizes, from different geographical, cultural, and social backgrounds, to improve sustainability in their related activities. It specifies environmental, social and economic requirements to implement a sustainability management system in accommodation establishments in the tourism sector.

ISO 21401 includes four Annexes: A, B and C refer to each of the three dimensions of sustainability (environmental, social and economic) and Annex D provides examples of sustainability practices.

3.3 ISO/TC 228

ISO/TC 228 is a technical committee of the ISO responsible for developing internationally accepted standards for terminology and specifications of the services offered by tourism service providers, including related activities, touristic destinations and the requirements of facilities and equipment. Published standards in various tourism areas from diving, yacht, beach operation to sustainability management system for accommodation establishments and so on.

3.4 UN/CEFACT Green Paper on Sustainable Tourism

In 2019, UN/CEFACT released the Green Paper on sustainable tourism, which aims to study the new trend in tourism called Experience Programs. Experience Programs, specifically focused on local areas or regions within countries, could be provided by various agents such as tour agency, Destination Manager Organizations, Online Travel Agencies, or etc. Tourists (domestic or international) tend to visit regions not only to see them, but also to experience the nature, events and activities of that region and to engage with the people and local culture in a meaningful way. Experience Programs can be delivered in forms of

cultural, medical, sports, nature, arts, community-based and etc. and emphasize a large variety of information to be communicated and shared between participants (originators, operators, participating businesses, customers, etc.). This report outlines examples of Experience Programs which have had a positive impact on local economies as well as guidance on how local authorities can valorize such assets to attract tourism revenues to their regions and become more sustainable.

4. Suggested way forward for UN/CEFACT

The literature and current existed standards related to sustainable tourism are reviewed and classified into ten categories according to the service content or products provided by the tourism sectors, including travel agency, accommodations, transportations, restaurant, destination, shopping, entertainment, local government, experience program, and traveler. In achieving the SDGs by 2030, this white paper discussed the sustainable planning and actions could be adopted across ten tourism sectors. It's expected that more discussion on business standards of sustainable tourism can serve as a reference to foster feasibility of building a future electronic exchange system database in beneficial for sustainable development in the tourism industry.

Figure 1:
Sustainable tourism standards are reviewed and classified into ten categories



4.1 Food and restaurant

The food and restaurant experience are important elements associated with the tourism experience, acting as a mediator between local producers and tourists, communicating with each of them, and being mindful to focusing on local sustainability. Additionally, eating primarily local food can be an initiating part toward the immersing traditional travel experience, as it provides entertainment and cultural context in exciting ways. Food can play an important role in determining an individual's motivation to visit a particular destination. The sustainability planning in the restaurant sector can be focused on the food service it provides lead by the corresponding SDGs target number.

SDG	Target
3.9	Provide/ use/ encourage the source of organic food ingredients to avoid illnesses caused by chemical contamination
3.5	Post signs or guidelines on menu flagging the harm of alcohol
3.a	Strictly reinforce the non-smoking environment indoors and the surrounding area
6.3	Collect rainwater or recycled water for activities where the use of drinking water is not required (e.g. flushing, washing)
6.3	Take action to build the wastewater system to reduce sewer water pollution and avoiding wastewater dumping
6.4	Initiate water saving plan such as lower pressure of kitchen faucets, washbasins, and the restrooms, and automatic activation of kitchen sinks or tap water
6.4	Set up goals to reduced water consumption and monitor periodically
6.4	Set up goals for the rational use of water such as the water use limit per activity (e.g. 10 litres for each meal)
7.2	Adopt efficiency energy management, set up smart energy meters and documentation for the assessment for energy conservation
7.3	Adopt efficiency energy management, set up smart energy meters and documentation for the assessment for energy conservation
8.5	Hire disable people without any discrimination at cashier area or any other suitable jobs
8.6	Create job opportunities in the food services for young and senior people and encourage equal pay
8.8	Take action for protecting labor rights and promoting a safe and secure working environment
12.3	Assess food waste during food preparation and distribution
12.3	Train employees to avoid food waste during all stages of meal production, from the receipt of food to distribution
12.5	Adopt strategies to minimize the use of disposables materials as much as possible, and documented in the record
12.5	Adopt strategies to reduce the use of plastic in the distribution of meals
12.5	Return packaging boxes for suppliers to reuse
12.5	Use lamps, accessories or furniture made from recovered or recycled material

4.2 Accommodation

Accommodation buildings require a significant amount of energy resources to operate and provide appropriate service for visitors regardless the size of the entities. The majority of electricity usage for operation is commercially purchased that indirectly leads to the release of greenhouse gas emissions and

contributes to climate change. Companies in this sector are strongly encouraged to implement energy management system to reduce environmental impacts and to improve their reputations with guests, who are increasingly concerned about environmental sustainability. The sustainability focus of accommodation can be water management, energy management, labor practice, climate change adaption and ecological impacts.

SDG	Target
6.1	Have plan for water risk assessment
6.3	Do sewage treatment
6.4	Ensure sustainable freshwater supply and recycling
6.4	Monitor the use of water, i.e. per tourist/night per source
6.4	Use water-saving equipment used to minimize water consumption, i.e. use water-saving shower head and toilet
6.4	Set goals for reducing water consumption and has regular checking records
6.4	Guide staff and guests on minimizing water use, i.e. promoting reuse of towels and sheets for multi-day stays to reduce cleaning water usage
7.2	Favor renewable sources and monitor the share of renewable energy in total energy supply, i.e. solar panels on the roof
7.3	Monitor and manage the total energy used
7.3	Use the air circulation equipment to avoid excessive ventilation of air, and excessive use of energy for cooling
7.3	Use equipment and practices for minimizing energy use, i.e. use LED lights to reduce power consumption and purchase "Energy Star" appliances wherever possible
8.5	Promote equal pay for equal work
8.5	Protect the rights of disabled to work
8.8	Protect the rights of employees, promote a safe working environment
12.2	Buy organic, fair trade, eco-friendly toiletries and in-room products
12.4	Implement practices to minimize pollution from noise, light, runoff, erosion, ozone-depleting substances, and air, water, and soil contaminants
12.5	Reduce the use of disposable spares inside the room and reward passengers for their own spares
12.5	Provide recycling bins in public areas, i.e. lobby and poolside
12.5	Donate leftover guest amenities, old furniture, and appliances to charities
12.5	Buy previously used or recycled-content products, whenever possible
13.1	Develop a climate risk management plan and regularly monitor the negative impact of climate change, i.e. the flood, typhoon, and drought where the lodging facility located

13.3	Monitor and manage total direct and indirect greenhouse gas emissions
13.3	Monitor and manage carbon footprint per tourist/night
13.3	Take actions to avoid and reduce significant annual emissions from all sources controlled by the lodging facility
14.1	Dispose wastewater and solid waste to a municipal or government approved treatment system
15.2	Preserve and cultivate local planting tree species, strengthen green landscaping and plant maintenance operations
15.4	Ensure the conservation of mountain ecosystems and increase ecological diversity
15.5	Mitigate activity with potential to disturb wildlife and habitats
15.7	Educate tourists on prohibition against poaching and trafficking in conservation animals and plants

4.3 Transportation

Transport services in the tourism industry carry tourists to and from destination, majorly relying on fuel transport vehicles, i.e. cars, tour buses, inland railways, aircrafts, ferries, cruise ships and so on. As a result of its heavy reliance on hydrocarbon fuels, the transportation industry generates a significant amount of carbon dioxide (CO₂) emissions. This sector is thus subject to compliance costs and risks associated with climate change mitigation policies. Fuel management has become a critical part of reducing emissions in sustainable tourism planning. Management of fuel usage environmental impacts of includes increasing fuel efficiency through vehicle and carrier design as well as and incorporating alternative and sustainable fuels.

SDG	Target
3.6	Implement safety management plan to decrease the injury from transportation accidents, i.e. tour bus, airline and cruise line
3.9	Significantly reduce air and water pollution from cars and all transportation systems
3.a	Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control as appropriate, i.e. ensure non-smoking transportation through the journey
6.3	Consider cruise pollution, including sewage or black water, gray water, oily bilge water, ballast water, solid waste, and hazardous waste
7.2	Significantly expand and apply the proportion of renewable energy from the energy system to transportation
7.3	Avoid transporting tourist in highly polluting, outdated vehicles. Adopt green, low-carbon emission environment-friendly transportation vehicles
7.3	Double energy efficiency by enabling clean energy supply for transportation

7.b	Combine with Smart City network to facilitate information exchange in increasing energy efficiency monitoring and management
11.2	Encourage public and private transport to enable safe, affordable and easy-to-use sustainable transportation for all the needs of women, children, persons with disabilities and the elderly tourists, (e.g. MM Mobility Management Scheme)
12.4	Implement practices to minimize pollution from noise, light, runoff, erosion, ozone-depleting substances, and air, water and soil contaminants on all tour related transportation, ex: cruise line, tour bus, railway, airline and etc.
12.c	Take action to rationalize fossil fuel inefficient subsidies and accelerate the transition to efficient clean energy for massive tour transportation
13.3	Monitor and manage total direct and indirect greenhouse gas emissions, especially on aircraft and cruise lines
14.1	Dispose wastewater and solid waste to a municipal or government approved treatment system
15.2	Reduce usage of fossil fuel vehicles to the natural habitats to lower the impacts or damage to forests and soils

4.4 Destination

A destination is more than a place with heritage resources (cultural and natural), infrastructures and services that attract tourists, which also serves the local residents and governments on the basis of economic growth. Destinations are subject to a wide variety of economic, social, and environmental changes over time and in highly different stages of development. Managing sustainable tourism should be a long-term scope and undertake a strategic plan for desirable results for the community, city and the nation.

SDG	Target
1.4	Employ local residents to develop, maintain and protect tourism resources and increase employment opportunities for local residents
2.3	Increase the market and high added value of land and local production resources, work on equal access to employment opportunities and double income
2.4	Sustain ecosystems, adapt to climate change, extreme weather events, droughts, floods and other disasters improve responsiveness and promote sustainable food production systems
2.c	Ability to obtain timely market information, such as food stocks, in response to emergencies and disasters
3.3	Remind passengers to protect themselves during an epidemic
3.4	Promote LOHAS travels to advance the quality of life of the elderly
3.6	Thoroughly implement the prevention of traffic accidents during travel, educate tourists about tourism safety protection matters to reduce the occurrence of tourism accidents

4.4	Address aging and declining populations in tourist areas, and reward sustainable tourism vocational skills and entrepreneurship to increase the proportion of youth and adults with the necessary skills for sustainable tourism
6.2	Assist in the establishment of public-use sewage and sanitation facilities to maintain the hygiene for all and advocate for reducing open defecation in the communities
6.3	Encourage travelers to bring their own environmentally friendly water bottles and not buy overly packaged items, so as to reduce regional tourist waste dumping and pollution from toxic chemicals
7.3	Avoid long-distance travel by vehicles and encourage in-depth tours in the local area
7.3	Increase the use of electric vehicle or transportation such as electric tour bus or railway system, to reduce carbon emissions to and from the destination
8.5	Non-discrimination of destination tourism hiring and wage provided, including men and women, young people and persons with disabilities, and provide equal pay for equal work
8.9	Promote sustainable tourism that creates job opportunities, promotes local culture awareness and economic development
10.2	Take care of the economic weakness in the industry, strengthen employability, promote salary growth, and continuously improve income distribution
11.2	Promote mobility management (MM) and mobility as a service (MaaS) that take into account the needs of vulnerable groups, women, children, the disabled, and the elderly, and build public transportation as social infrastructure aiming for public traffic safety and accessibility
11.4	Promote local tours and activities to protect and safeguard cultural and natural heritage
11.b	Develop comprehensive disaster risk management at all levels in the region for climate change mitigation, adaptation and resilience for sustainable development
12.5	Promote use of the unpackaged sales model for local purchase
12.5	Promote to live in a green and sustainable hotel
12.8	Raise awareness of people in tourist areas about sustainable lifestyles and quality of life in harmony with nature
13.3	Ensure education on climate change mitigation, adaptation and reduce gas emission in all tourist areas
14.1	Reduce marine pollution events and activities at all kinds, such as call for sunscreen-ban for water sports activities in the tourism area
14.c	Strengthen conservation education events and experience tours on topics of sustainable use of marine resources
15.4	Promote education tours to raise awareness of the conservation of mountain ecosystems and increase ecological diversity

15.7	Educate tourists against poaching and trafficking in conservation animals and plants on land
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4.5 Shopping

Shopping has become a relevant part of the tourist value chain in tourism, tourist visits destination outside their place of residence to shop for goods is also considered to be a determining factor for travel decision and prime motivation in some cases. Shopping is also one of the major categories in the tourism sector in representing a significant source of income for national economies both directly and through the many linkages to other sectors in the economy according to UN WTO. Shopping stations have become the intermediary role of local products and tourists, conveying local characteristics to tourists through authentic layout of local products, advocating local consumption in contributing to local economy growth.

SDG	Target
6.5	Ensure the shop is located in an area with good drainage system and implements a shunt processing system for drinking water and sewage treatment
7.3	Install energy saving management system (such as IoT sensors) for lighting devices, air-conditioning equipment, cleaning supplies, etc.
12.5	Reduce the use of plastic shopping bags in the shop/shopping mall
12.5	Reduce display of merchandise in plastic packaging in the shop/shopping mall
12.8	Use innovative digital technologies to increase the awareness of sustainability and efficiency of customer relationship management
12.b	Encourage the purchase of merchandise of the shop or shopping mall from local suppliers and manufactured by the local factories
14.4	Stop selling products in the shop/shopping mall made from endangered marine animals and plants
15.5	Stop selling products in the shop/shopping mall made from endangered animals and plants on land

4.6 Entertainment

Entertainment in the tourism industry is comprised business that operate entertainment, travel, and recreation facilities and provide related service to visitors. Business in this industry operate theme parks, ski resorts, sports stadiums, golf course and other venues that providing entertainment or experience to millions of visitors annually across various locations indoors and outdoors.

SDG	Target
3.6	Implement corrective actions in response to the serious fatalities and injuries while entering, riding or interacting with any of the facilities and features therein

3.6	Conduct routine inspection of risk plan to assuring facility safety such as the amusement park rides, ski slopes as well as venues where large crowds of people may be present, such as indoor water parks, sports and concert venues
3.a	Create smoke-free facilities (casinos) to attract more non-smoking tourists and prevent the employees exposed to second hand smoke related to respiratory illness
6.4	Reduce artificial snow making in skiing resorts, such as snow cannons which heavily rely on water during snow making
7.3	Encourage implementation of energy management system to reduce environmental impacts and to improve energy efficiency in large outdoor (sports venues) and indoor entertainment facilities (casinos) that may consume a significant amount of energy for heating, ventilation, air-conditioning (HVAC), and lighting, which indirectly leads to the release of greenhouse gas (GHG) emissions
7.3	Install energy saving management system (such as IoT sensors) for lighting devices, air-conditioning equipment, cleaning supplies, etc.
8.8	Protect labor rights and promote safe and secure working environments for all worker in theme parks, casino, and cruise ship in the tourism related entertainment industry to reduce low-wage environment, and long-hour work duties
12.4	Promote less energy-intensive golf course to reduce water, pesticide, fertilizer and fossil fuel use to minimize the adverse impact on human health and environment
13.3	Take action to reduce significant annual emissions from all diesel generators in the highly demand entertainment industry to run power supply which produce high levels of nitrous oxide and other air pollution
15.2	Limit skiing resort growth and expansion around the environment fragile natural habitats
15.2	Encourage habitat restoration, reseedling of exposed runs in the skiing industry to attract skiers support sustainable development

4.7 Tour agency

Travel agencies help tourists in planning and booking reservations for their itinerary, accommodation, and transportation to and from the destination. Many travel agencies may have been in different pace to adopt the environmental and social goals varied by scale of firms. Smaller firms often do not possess sufficient funds for instituting environmental management standards and often use philanthropy as a means to give back to local people and destination. As for the larger firms, environmental goals are more widely implemented within a comprehensive plan to achieve environmental efficiencies. As for the travel experience, travel agencies could also involve the sustainable concepts into the itinerary planning in a way to improve the welfare of local people, minimize negative environment impacts, and help to conserve heritage cultures and all kinds of habitats in a long run.

SDG	Target
1.4	Ensure that all men and women have access to basic services, ownership and control of land and other forms of property. In addition, tourists are allowed to have equal rights and services in natural resources, economic resources and tourism resources
1.5	Develop travel itinerary that take into account climate change issues and economic, social and environmental disasters in tourist areas
3.3	Strive to foresee the epidemic situation in the region and ensure the safety and security of travelers in the region in response to various infectious diseases, travel agencies should
3.5	Remind tourists of drug abuse and excessive alcohol intake according to local policy
3.6	Strive to ensure safety of all passengers during transportation based on past traffic accident cases and causes
3.8	Help all travelers to prevent and obtain adequate health care plan at an affordable cost
3.9	Make travel itinerary to avoid hazardous chemicals and various types of pollution
4.4	Increase the proportion of young people and adults with technical and professional skills required for sustainable tourism practices
4.7	Ensuring tourists acquire knowledge and skills for sustainable tourism to facilitate cultural diversity and sustainable cultural development
4.7	Travel agencies should educate all employees the concept of environmental protection and humanistic conservation, and best practice during the trip
6.4	Reduce the use of bottled water and reward travelers with their own water bottles
8.6	Travel agencies can provide a certain percentage of employment opportunities and training for young people
8.7	A set of audit documents of DMC can be prepared in assist of tour agency during the itinerary planning process to confirm whether there is any illegal employment of child labor or job opportunities for people at all society and economic status were provided
11.4	Respect the traditional culture and the privacy of local residents and communities
11.6	Travel on a sustainable transportation system
12.2	Provide e-tourism brochure to reduce paper waste
12.2	The company can reduce paper production through technology and artificial intelligence. Also, through the operation of cloud systems and data analysis to better understand visitors' preferences

12.5	Travel agency should encourage travelers to bring their own environmentally friendly tableware or straws during the trip
12.6	Arrange travel choices according to sustainability factors such as sustainable affiliate or self-report of sustainability hotel properties, food-beverages services, and transport company
14.1	Do not arrange tourism activities that will affect marine resources and ecology
15.1	Promote green tourism that can reduce environmental pollution and resource consumption
15.1	Encourage an environmentally friendly model and low-carbon emission tour
15.1	Take the responsibility of restraining tourists, implement the concept of green tourism and conservation, and formulate relevant punishment and penalties for violations
15.2	Promote responsible tourism practices by arranging leave no trace tours

4.8 Local government

While national government of tourism is in charge of regulations and develop major socio-economic activities to promote tourism within and outside the country, the local government served as an official local authority which provide the infrastructure, policy and planning procedures to maximize the benefit for local communities by creating linkages between government and its residents and businesses. Effective local governance has been identified as one of the most influencing factors in sustainable tourism development.

<i>SDG</i>	<i>Target</i>
9.1	Has planning guidelines, regulations and/or policies which control the location and nature of development, require environmental, economic, and socio-cultural impact assessment and integrate sustainable land use, design, construction, and demolition
11.a	Local communities' aspirations, concerns and satisfaction with tourism sustainability and destination management are regularly monitored and publicly reported, and action is taken in response to them
12.8	Making guideline for visitors about sustainability issues in the destination and the part that they can play or contribute to the local communities
12.b	Regularly monitor and publicly report visitor satisfaction with the quality and sustainability of the destination experience and take action in response
12.b	Action is taken to monitor and manage the volume and activities of visitors, and to reduce or increase them as necessary at certain locations varied by seasonality, working to balance the needs of the local economy, community, cultural heritage and environment
17.14	Promote policy or strategic planning in supporting specific destinations being certified sustainable
17.14	Making policy in establishing targets for private sector hotel and tour operator certification

17.14	Sustainability principles and an assessment of assets, issues and risks should be contained in the governance strategy and action plan
17.14	Implementing a system to monitor and respond to socio-economic, cultural and environmental issues and impacts arising from tourism
17.14	Actions and outcomes towards sustainable tourism are regularly monitored, evaluated and publicly reported
17.17	Adoption of national or provincial policy frameworks that encourage actual practice and implementation with local tourism business or institutions
17.17	Promote the collaboration between public and private sector in making the destination being certified as sustainable

4.9 Experience programs

Experience Programs, specifically focused on local areas or regions within countries, are a growing global trend. From the perspective of regional vitalization, environmental sustainability, and the promotion of quality of life for visitors and residents has generated more attention. With experience program, the travelers could gain authentic, local experiences; and in the meantime to help promote the quality of life of both visitors (who experience the variety of EPs in the region) mentally or physically, and the inhabitants of regions (who earn a living by working in EP-related businesses).

SDG	Target
1.4	Employ local residents to develop, maintain and protect tourism resources and increase employment opportunities for local residents
3.4	Promote LOHAS travels to advance the quality of life of the elderly
3.5	Remind tourists of drug abuse and excessive alcohol intake according to local policy
3.6	Strive to ensure the safety of all passengers during transportation when it's provided and educate tourists about tourism safety protection matters to reduce the occurrence of tourism accidents
4.4	Address aging and declining populations in tourist areas, and reward sustainable tourism vocational skills and entrepreneurship to increase the proportion of youth and adults with the necessary skills for sustainable tourism
4.7	Ensuring tourists acquire knowledge and skills for sustainable tourism to facilitate cultural diversity and sustainable cultural development
4.7	Program provider should teach all employees the concept of environmental protection and humanistic conservation, and best sustainable practice during the program
6.3	Encourage travelers to bring their own environmentally friendly water bottles
6.4	Reduce the use of bottled water and reward travelers with their own water bottles
7.3	Encourage in-depth tours in experiencing the cultural value in the local area

8.5	Non-discrimination of program hiring and wage provided, including men and women, young people and persons with disabilities, and provide equal pay for equal work
8.9	Promote sustainable tourism that creates job opportunities, promotes local culture awareness and economic development
11.4	Promote local tours and activities to protect and safeguard cultural and natural heritage
12.2	Using e-platform or apps to share program information or photos to reduce paper waste
12.5	Travel agency should encourage travelers to bring their own environmentally friendly tableware or straws during the trip
12.6	Arrange travel choices according to sustainability factors such as sustainable affiliate or self-report of sustainability hotel properties, food-beverages services, and transport company
13.3	Education of climate change mitigation, adaptation and reduce gas emission in the related experience program
14.1	Reduce marine pollution events and activities at all kinds, such as call for sunscreen-ban for water sports activities in the tourism area
14.1	Do not arrange tourism activities that will affect marine resources and ecology
15.1	Promote green tourism that can reduce environmental pollution and resource consumption
15.1	Encourage an environmentally friendly model and low-carbon emission tour
15.1	Take the responsibility of restraining tourists, implement the concept of green tourism and conservation, and formulate relevant punishment and penalties for violations
15.2	Promote responsible tourism practices by arranging leave no trace tours

4.10 Travelers

Travelers are closely related to the tourism industry and the total number of travelers in the world has been increasing year by year, exceeding 1.3 billion in 2017 and is expected to increase after the coronavirus. Traveler's behavior has grown into a new form of travel to Experience Programs with a variety of forms and subjects, which can be seen as a shift to travel-sustainable tourism.

SDG	Target
1.4	Interact equally with the people of the areas you visit, pay appropriate compensation when using local resources, etc., and take action to contribute to the enrichment and sustainability of the region through travel
3.5	Act with strict prohibition of ingestion to drug abuse, alcoholic beverages and other substances during travel

3.6	Follow local traffic rules for using transportation, automobiles, etc. and prioritize the prevention of traffic jams, over tourism and accidents
3.9	Make efforts to prohibit or minimize conduct of all hazardous substances which will lead to air, water and soil contamination at the destination
3.a	In principle, to strictly obey the tobacco regulations when traveling
4.7	Consider cultural diversity and cultural sustainability in the travel destination, and as a traveler contribute to sustainable development, and make understanding, cooperation and support so that all learners in the community acquire the necessary knowledge and skills
5.1	End all forms of discrimination against all women and girls everywhere
6.2	Do not defecate in the open air. Request cooperation as a traveler to install safe and hygienic public toilets in the right place for everyone's needs. Consideration shall be given to environmental maintenance
6.4	All people cooperate in the availability and sustainable management of water and sanitation
7.1	Avoid CO2 emissions and other air pollution by ensuring universal access, including the use of affordable and reliable modern energy services and natural energy. Travel and transportation plans shall be carried out with these considerations in mind
11.4	Cooperate in the sustainable continuation of tourism resources through actions that take into account the protection and conservation of local cultural and natural heritage in all areas of travel
12.8	Ensure to have information and awareness about sustainable development and lifestyles in harmony with nature wherever in traveling
14.1	Prevent marine pollution of all kinds, in particular from land activities, including marine litter and eutrophication, and do not pollute the ocean of any kind
16.1	Do not engage in all forms of violence everywhere
16.2	Abuse, exploitation, trade and all forms of violence against children and work from the perspective of a traveler to eradicate torture

5. Rating system

5.1 Rating method in the self-rating system

This Business Standards feature the introduction of the self-rating system of the practitioners' practices.

When introducing it, it is necessary to first think about the definition of a good initiative.

In carrying out the practices, it is necessary to ensure that they are surely carried out within the budget by the set deadline, and we think this can be called a good initiative.

This corresponds to the quality control requirements in manufacturing, etc., but it also can be seemed valid in the rating of the human conduct.

Therefore, in rating, we apply CMMI (Integrated Capability Maturity Model), which was initiated for software development process evaluation and improvement activities and later adopted by government agencies and private organizations, to practices for sustainable tourism, and it will rate the object higher as the practice matures proceed.

In other words, high ratings in performance represent high maturity.

5.2 Integrated Capability Maturity Model Concept

CMM ^[1], which is the basis of CMMI, focuses on the importance of processes among the three main elements related to quality, reliability, and productivity: “people - technology - processes”. CMM assumes that “the quality is greatly influenced by the quality of the processes used to develop and maintain it.” So, it focuses on process improvement in organizations, presents the key elements of a process, and presents improvement pathways for evolving from ad hoc and immature activities to orderly and mature processes.

Here we define the following key CMMI concepts as they are applied to the tourism practice:

Process: a set of steps carried out for a given purpose, defined as a set of activities, methods, exercises, outcomes, etc. in carrying out a practice. As an organization matures, processes become well defined and consistently implemented throughout the organization.

Process Maturity: it indicates the extent to which a particular process is explicitly defined, managed, monitored, and effective. Maturity signifies the potential for improvement and indicates both the richness of an organization's processes and the consistency applied in execution throughout the organization. In the mature organizations, the process is well understood throughout the organization, usually through documentation and training.

5.3 Each stage of the maturity level

CMMI generally uses a staged representation to indicate improvement paths to mature processes.

The staged representation, which provides an improvement path focused on organizational maturity, is outlined below and its application to tourism is also shown.

Figure 1 also shows maturity levels and their application to tourism.

<p>Level 1 Initial: The software process is characterized as ad hoc and occasionally even chaotic. Few processes are defined, and success depends on individual effort.</p> <p>Application to tourism: There is no awareness of the SDGs, and there is a lack of awareness for the prioritized sustainable tourism items. There is no formalized method for executing the practices, but they are dealt according to the situation.</p>
<p>Level 2 Repeatable: Basic project management processes are established to track cost, schedule, and functionality. The necessary process discipline is in place to repeat earlier successes on projects with similar applications.</p> <p>Application to tourism: Although the SDGs are recognized to some extent, only limited items are taken up and implemented in a limited manner in response to prioritized sustainable tourism items. As for</p>

similar implementation processes, the approach is to follow the example of previous successful practices.

Level 3 Defined: The software process for both management and engineering activities is documented, standardized, and integrated into a standard software process for the organization. All projects use an approved, tailored version of the organization's standard software process for developing and maintaining software.

Application to tourism: A standard performance process approved in the organization is established. Sufficient awareness of the SDGs is recognized, and priority consideration has been given to the prioritized sustainable tourism items, some of which are being implemented.

Level 4 Managed: Detailed measures of the software process and product quality are collected. Both the software process and products are quantitatively understood and controlled.

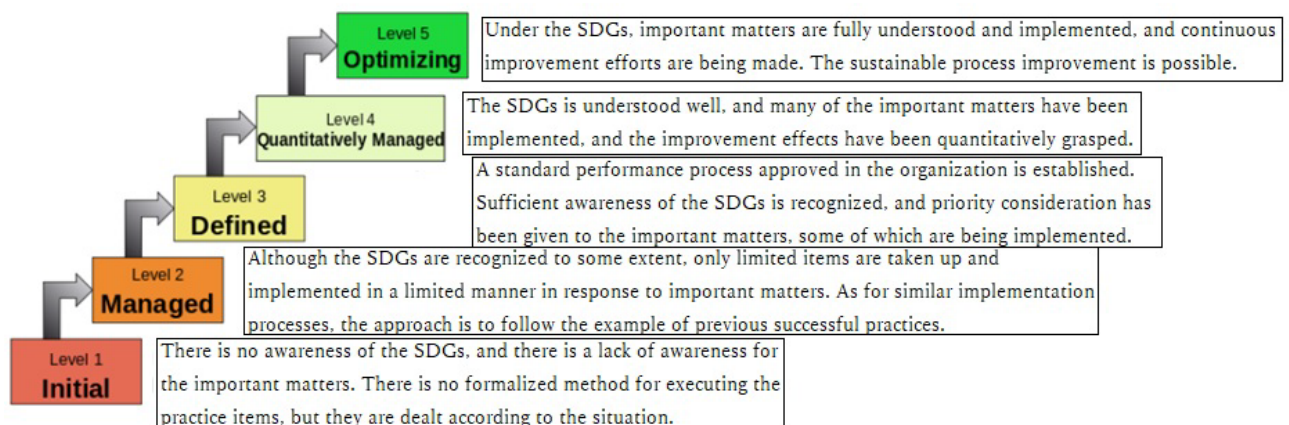
Application to tourism: The SDGs is understood well, and many of the prioritized sustainable tourism items have been implemented, and the improvement effects have been quantitatively grasped.

Level 5 Optimizing: Continuous process improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.

Application to tourism: Under the SDGs, prioritized sustainable tourism items are fully understood and implemented, and continuous improvement efforts are being made. The sustainable process improvement is possible.

Figure 2 shows levels of tourism-related maturity based on the SDGs. [2]

Figure 2:
Levels of tourism-related maturity based on the SDGs



[1] Capability Maturity Model for Software(R), Version 1.1 (CMU/SEI-93-TR-24) 1993
 [2] Sally Godfrey (2008) [software.gsfc.nasa.gov/docs/What%20is%20CMMI.ppt What is CMMI?]. NASA presentation. Accessed 8 December 2008.

5.4 Indication of self-rating results by practitioners on prioritized sustainable tourism items

The prioritized sustainable tourism items are extracted from the requirements for tourism in the SDGs and set as follows:

- From Target 8.9, we can take “job creation and products promotion” to promote sustainable tourism;
- From Target 11.4 and 14.7, we can take “cultural and natural heritage protection and natural environment conservation”; and
- From Target 12.b, we can take “to monitor sustainable development impacts for sustainable tourism”. It can be regarded as "destination management".

Based on the above, we believe that the practices of each category can be arranged according to the following prioritized sustainable tourism items with which the practitioners should comply preferentially.

- A. “Job creation and products promotion”
- B. “Natural environment conservation”
- C. "Cultural heritage conservation"
- D. “Destination management”
- E. "Other prioritized sustainable tourism item"

Table shows an example of indicating the self-rating results by the practitioners.

The numbers in the table indicate the maturity level on each prioritized sustainable tourism item.

A rating of 0 indicates that there is the practice to be taken, but the practitioner has not yet taken action.

A blank column indicates that there is no practice that corresponds to the prioritized sustainable tourism item. For example, the restaurant does not contribute to the cultural heritage conservation and the destination management.

Table:

An example of indicating the self-rating results by the practitioners

Classification		Classification				
		num.	A. Job creation and products promotion	B. Natural environment conservation	C. Cultural heritage conservation	D. Destination managemen t
4.1	Restaurant ABC		1	2		1
4.2	Hotel ABC		2	1		1

Category Practitioner	Classification num.	A.	B.	C.	D.	E.
		Job creation and products promotion	Natural environment conservation	Cultural heritage conservation	Destination managemen t	Other prioritized sustainable tourism item
4.3 ABC Railway			2			0
4.4 Destination ABC		2	3	1		1
4.5 Souvenir shop ABC		1	2			
4.6 Leisure Hall ABC		2	1			0
4.7 Agency ABC		1	2	2		1
4.8 Municipality ABC		1			3	
4.9 Experience program ABC		1	2	2		1
4.10 Traveler ABC			2	1		0

5.5 Utilization of self-rating system

By publishing the practices and self-rating information of the travel related organization and traveler (hereinafter the practitioner), which are the results of this project, through the network, the consumers will be able to identify sustainable tourism when purchasing EPs.

In other words, we intend that in the future, this result will be delivered to the consumers as significant information in electronic transactions using EPs artifacts.

Here, the practitioner's self-rating is indicated in the framework of prioritized sustainable tourism items, but if the self-rating information can include the practices that the practitioner has worked on, by searching for the SDGs expression, the consumer will be able to know the situation of the practitioner's initiatives.

For example, if the consumer wants to access to clean energy in a destination, it will be possible to find out about tourism operators that are working to use clean energy.

6. Future opportunities and risks

After having standard to define sustainable tourism, a standard of exchanging sustainable tourism data is still missing. Travelers are not able to collect the sustainable data from all suppliers' website. Travel agencies are not able to collect all sustainable indicators form all different types of travel suppliers of each travel sector to consolidate them in order to indicate the sustainability of a package tour. Therefore, a data exchange standard for sustainable tourism could be the key turning point for tourism industry. But tourism industry is a very big industry including of many different types of suppliers, making this data exchanging standard, we still need to overcome several challenges.

6.1 Centralized unique ID challenges

In the traditional way of data exchange, every business entity needs to have a unique ID to be the primary key of database. Nationally, Tax ID is the best unique ID for business entities. Internationally, industry based centralized organizations are acting the role of delivering Unique IDs for business entities within the industry. For example, International Standard Book Number (ISBN) for books, International Air Transportation Association (IATA) for airline, International Maritime Organization (IMO) for ships. To establish an organization for the whole travel industry would be a mission impossible challenge.

There are two functions of Centralized Unique ID Controlling Organization, the first one is to make sure there are no multiple business identity using the same ID, the second one is to verify the business identity actually exist.

In the Decentralized generation, adopting Universal Unique Identifier (UUID) technology into the new sustainable tourism data exchange standard, can solve the first function, the second function of verify the existence of business entity, can be solved by “local verification body”, or need to develop a mechanism for verified business entities to verify each other, and this mechanism can be used by every working group, not only for TT domain, and this can be a stand along project.

6.2 Challenges in packaging and reselling travel products

Unlike other industries, travel products are often packaged and resold using multiple intermediaries. This makes it difficult for the consumer to know who the real supplier is. It is not possible for travel consumers to access sustainability data without knowing the details of the original supplier of the travel packages. In order to solve this problem, the packager of the travel product would need to be responsible for attaching sustainability indicator data to the product before resale. This means there is a need to develop a multi-player sustainability data packaging mechanism.

6.3 Centralized data storage challenges

Another big problem for the travel industry is that data is currently controlled by big tech companies. Global distribution systems (GDS), social media platforms, big tech companies and their platforms will not be able to exist forever, and so this data will inevitable be lost as well. Furthermore, this data is currently being used to generate profit for big tech companies; however the whole world contributes to this data pool and it should therefore be used to the benefit of all. While this was not possible in the past, the invention of blockchain technology has created new possibilities in this area. If a standard way of structuring tourism sustainability data can be designed, this data could be stored on a decentralized blockchain—not a specific chain, but any chain—and then this problem could be solved.

6.4 Availability of detailed sustainability information

Currently, travel sustainability information is verified by various certification bodies, but often travel consumers are only informed whether a travel business player or a travel product has “passed” or “not passed”. The details of the sustainability rating is not shared, leaving its meaning open to interpretation. For example, one hotel might do a great job of using green energy, but could be less successful in implementing waste management. Indicating that an airline company has not caused any damage to life under water can mean anything. The proposed sustainable tourism data exchange standard will need to include the ability to exchange the details of the sustainability information as well.

6.5 Unified chapter and verse system

In the future, sustainable tourism standards will be translated into different languages and used in different places in the world. Travelers will need to understand sustainable data from traveler supplier without understanding their language, thus we may have to standardize the system to make it universally understandable.

In order to solve the challenges above, the development of Sustainable Tourism Data Exchange Standard is suggested to be divided into three stages.

Stage 1, after this white paper, Sustainable Tourism API standardization process must be started, data fields need to be decided, using this API standard, travel business entries like hotels and travel agencies can start writing programs to exchange data each other.

Stage 2, in travel industry, most business entities are small companies, developing software and connecting APIs with other business entity could be way difficult task, thus there might be profit or non-profit organizations established to store sustainable tourism data and connecting each other by API, travel business entities only need to register to these organizations and fill out forms, at this stage, traveler only need to connect to these organizations to get sustainable tourism data, no need to read hundreds of travel supplier's website to collect data, of connecting to each travel suppliers API to gather data, but at this stage, data is getting more centralized, and the problem of Unique ID have to be solved.

Stage 3, a decentralized way of storing sustainable tourism standard should be created, at this stage, every travel business entity, OTAs, local verification bodies, travel agencies, should have a standard way of storing data into any blockchain. This project is not going to propose to create a public block chain, because every public block chain is still controlled by a centralized development team, not to mention public chains are getting way too competitive, also chains are comes and goes while development team have not enough budget to sustain itself. By theory data saved on Blockchain can sustain forever, by reality chains are disappearing while developing team dismissed and miners are not interesting on this chain anymore. So, the true decentralize way of data storage is not to create a block chain, but to create a way to storing data on every different chain. A way of formatting data into standard JSON format, to store into every block chain and to read out from every block chain. At this stage, Sustainable Tourism data will not be used by any companies for profit purpose. Data will be able to be used by everyone in the world and owned by everyone in the world.

6.6 Supply chain challenges

Supply chain is not easy to require fulfilment, it is difficult to set boundaries

A travel itinerary is composed of a complex chain of services that complement each other. Every aspect of service and material provision, including flights, dining, transportation, and lodging, involves a complex supply chain. For example, some campaigns encourage the public to restore the footprints, campfires, and cooking of their camps as much as possible after climbing, rather than just bringing down items that did not originally belong to the mountain. This is an example of the concept of sustainability. But climbing activities involve transportation to and from the mountain, lodging, and access to food, all of which are opportunities to implement sustainable tourism. Therefore, in the development of sustainable tourism standards, we should adopt an ecosystem perspective to standardize sustainable tourism standards. Rather than focusing on a single entity. As for a single entity, the evaluation should be based on the continuity of the entire service chain, rather than the evaluation of a single object, location, product, or venue. The evaluation mechanism of the ecosystem, that is, the supply chain, should focus on the overall score, rather than the outstanding performance or score of individual economies. However, how to define the scope of ecosystem or supply chain, and how to evaluate different suppliers in the ecosystem may be different, and how to have common quantitative results will be the issues that must be overcome in the future implementation.

Obtaining a sustainable tourism label limits the diversity of products

After an individual operator obtains the Sustainable Tourism Certification, due to the interdependent nature of the supply chain, it is possible that other supply chains may not be able to follow through on obtaining the certification or supplying goods and conditions that meet sustainable standards, and may drop out of the supply chain, resulting in services that cannot be constituted, the scarcity of products, or higher supply costs. As sustainability education in the travel market is difficult to spread, the visibility of

low price over quality in the travel market is more likely to be perceived as more important by consumers, and meeting sustainability standards is naturally difficult for industry players to be motivated to participate.

Although there are large operators to drive the trend, it only stops at the first level of supply chain relationship

Although large tour operators are driving the trend of sustainable certification from a supply chain perspective across countries and in the transportation, lodging, food and beverage, and attractions industries, it is difficult to demand or create the motivation to participate in sustainable tourism beyond the first level of the supply chain. However, in a business-to-business environment, it is difficult to ask for or contract further motivation to participate in sustainable tourism beyond the first level of the supply chain. Sustainability has not yet become a socially responsible concept that is not driven by commercial interests. In the future, when it comes to promoting sustainable standards or certifications, government civic education, coupled with the cooperation of international organizations, will be the fundamental driving force for companies to actively participate in sustainable standards and certifications in the future.

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