

The achievement of the aim of the work with an Empirical analysis of elicited weights in The Analytic Hierarchy Process resulted in the selection of the most appropriate evaluation methods for Latvian conditions, in the interests of local inhabitants, tourists, entrepreneurs, the region and the state:

1. In the Local inhabitants Interests Group, these are Carbon footprint calculation and offsetting, Environmental impact assessment and Input-output analysis method;
2. In the Tourists interests group, Carbon footprint calculation and offsetting, Environmental impact assessment and Input-output analysis method;
3. In the Business Interests Group, the Risk and vulnerability assessment method;
4. In the Region interests group - Carbon footprint calculation, Environmental impact assessment and Risk and vulnerability assessment method;
5. In the State interests group – Risk and vulnerability assessment method and Input-output analysis method.
6. In the assessment of the climate and environmental impacts of sustainable tourism development, the Tourism value chains for low-carbon method was the least preferred assessment method.

## Introduction

Response to COVID-19 pandemic has caused temporary improvement in climate and environmental parameters, but tourism emissions, even during 2018-2021, accounted for 8%-11% of global carbon emissions. In addition to these direct emissions, tourism development also causes CO2 emissions, degrading ecosystems that act as carbon sinks. As the tourism sector experiences a strong recovery from the impacts of the Covid-19 pandemic, methods for assessing the climate and environmental impacts of sustainable tourism development are crucial for promoting global sustainability and mitigating climate change.

## 2. Methodology

1. In the analysis of the scientific literature, the authors first categorised the features of the methods for assessing the climate and environmental impacts of sustainable tourism development according to their functions, which were carried out according to the sequence in Fig.1
2. A multi-criteria decision-making method was used for the selection of evaluation methods – Analytical hierarchy process with empirical analysis (AHA) of the obtained weights. The authors used a four-level hierarchy scheme, where level 1 (M), is the objective of the work - to find the most appropriate alternative (A), which can be done by pairwise evaluation, level 2 - criteria groups (KG), level 3 - criteria within criteria groups (K) and level 5 elements

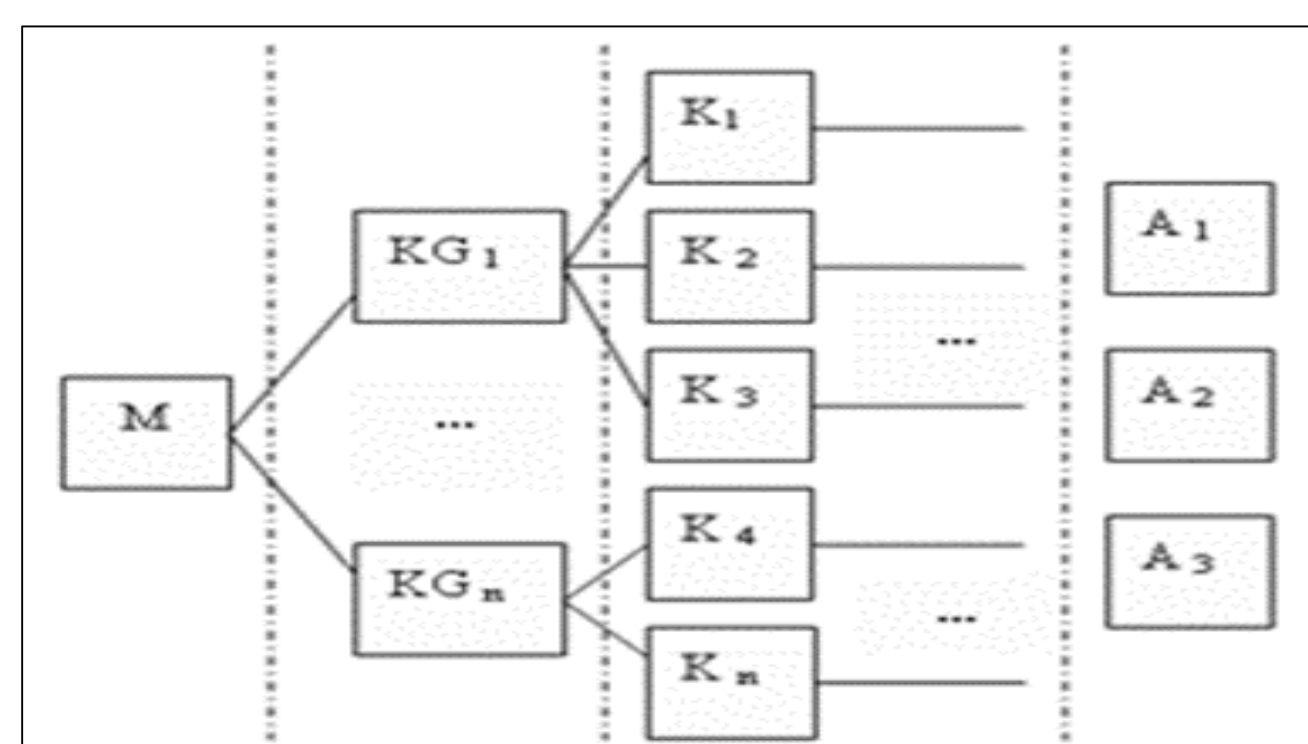


Fig. 1. Hierarchy of the 4 levels of criteria for evaluating alternatives in a general way according to the principles of the AHP method

## 3. Results

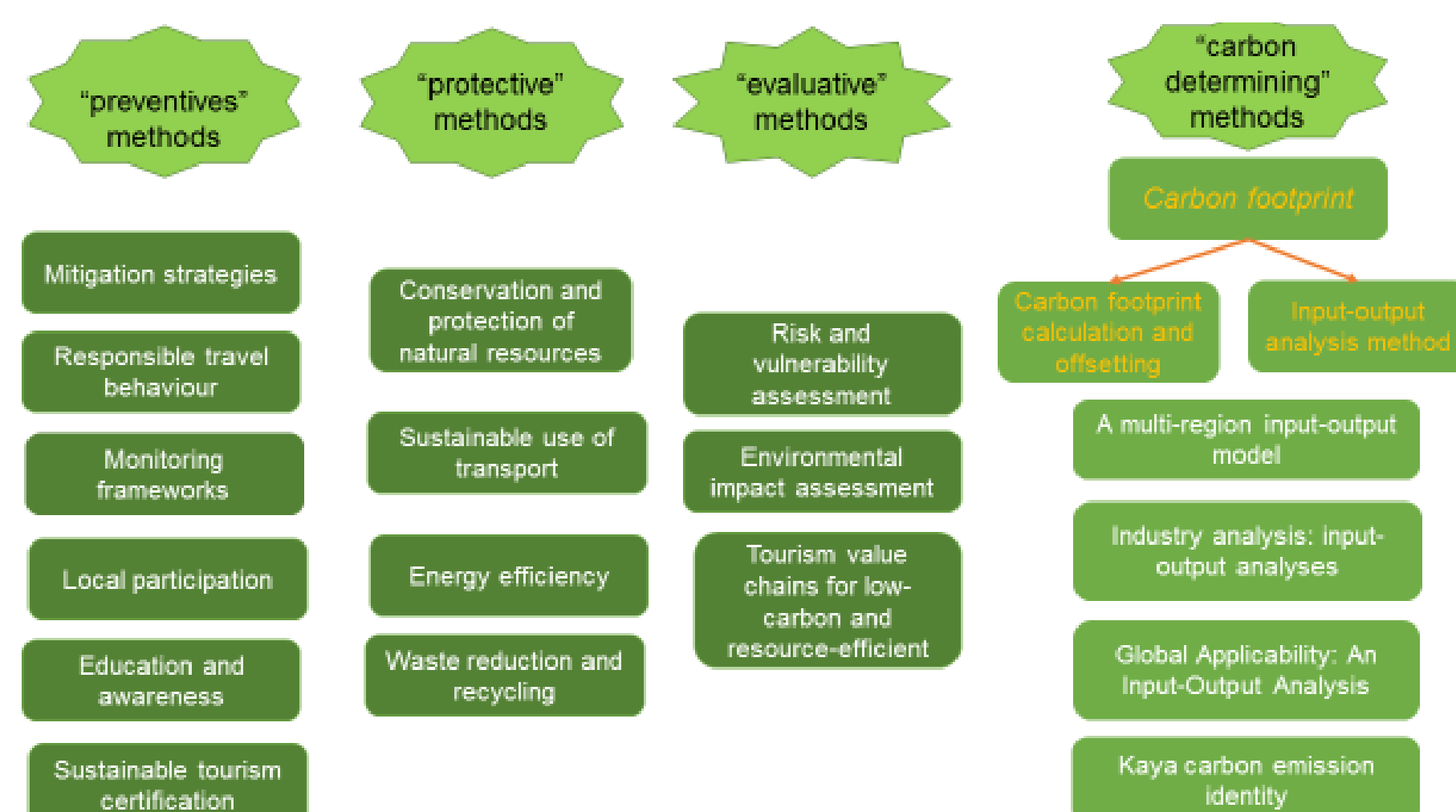


Fig. 2. Methods of assessing the impact of sustainable tourism on the climate and environment.

TABLE 1. CRITERIA GROUPS (KG) COMPARISON

Criteria groups	Criteria weight (W)				
	E1	E2	E3	E4	E5
Interests of local inhabitants	0.20	0.20	0.21	0.16	0.23
Tourists' interests	0.13	0.13	0.21	0.19	0.17
Business interests	0.16	0.16	0.21	0.19	0.17
Region interests	0.31	0.31	0.18	0.17	0.17
State interests	0.20	0.20	0.21	0.28	0.26

Fig. 3. Example of results in the selection of the most appropriate evaluation methods.

Tourists interests	Region interests				
	E1	E2	E3	E4	E5
Carbon footprint calculation	0.18	0.19	0.17	0.14	0.23
Environmental impact assessment	0.22	0.19	0.18	0.25	0.23
Input-output analysis method	0.22	0.19	0.18	0.25	0.23
Tourism value chains for low-carbon	0.15	0.22	0.14	0.17	0.11
Risk and vulnerability assessment	0.22	0.19	0.18	0.20	0.19
Region interests					
Carbon footprint calculation	0.23	0.22	0.22	0.22	0.23
Environmental impact assessment	0.18	0.22	0.22	0.22	0.23
Input-output analysis method	0.18	0.22	0.22	0.22	0.19
Tourism value chains for low-carbon	0.23	0.11	0.15	0.10	0.11
Risk and vulnerability assessment	0.18	0.22	0.19	0.22	0.23