



Stakeholder involvement in developing sustainability indicators for tourism

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Aim

This study is a part of a larger project which aims to develop a framework of sustainability indicators for tourism in Vatnajökull National Park (VNP), Iceland. The specific aim of the study is to assess how tourism stakeholder perceptions can be integrated into evaluation of sustainability indicators for tourism in VNP using the systemic indicator systems (SIS) method.

Methods

In-depth interviews were made with tourist hosts, governmental employees and national park employees and rangers in north and west territories of VNP. These tourism stakeholder were asked how they perceive local tourism development, sustainable development and environmental management. The SIS method was then used to evaluate the relevance of verbalized sustainability issues in these interviews to measuring sustainability in VNP. This was done in three steps:

- 1) Formulation of indicator variables**
- 2) Criteria matrix that verifies if the variables represent the tourism system (figure 1).** The variables were compared with criteria keywords and given a score according to dependence on all or almost all (1); half (0,5); or one or none of criteria keywords (-).
- 3) Correlation matrix and an effect analysis diagram (figure 2).** A pair-wise comparison with a 0 – 3 scale was made to identify the effect of each variable on another. Accordingly: No relation (0) means that a change of indicator A causes no or very weak change in B or change after significant time delay; Weak relation (1) means that a strong change of indicator A causes small change in B; Proportionate relation (2) means that a change of indicator A results in similar change in B and; Disproportionately high relation (3) means that a small change of indicator A causes strong change in B.

(adopted from Schianetz & Kavanagh, 2008 and Chan & Huang, 2004).

Initial results

The results of a criteria matrix indicates that the chosen indicator variables are descriptive for the full tourism system in VNP. The vertical sums are evenly distributed to the different criteria, and the average vertical sum for each of the four criteria themes range from 12,7 to 13,1 (figure 1).

The results of a correlation matrix and the effect analysis diagram are that the indicator variables are very interconnected (figure 2). The indicator variables with the highest product value (P) are the most critical for the system: **Destination attractiveness (14)**, **Local economy (17)**, **Social carrying capacity (1)**, **Societal seasonality (2)**, **Economic seasonality (18)**. 2 and 18 have a high active sum (AS), which measures the effect the variable has on other variables. 14, 17 and 1 have a very high passive sum (PS) which measures the degree in which a variable is affected by other variables. Lastly, **Employment (5)** has the highest AS, a medium P value, but a very high quotient value (Q). This means that the variable is active rather than re-active and has the potential to be instrumental as a control variable in policy design.

| Indicator variables | Criteria | | | | | | | | | | | | | | | | | |
|---|----------------|------|------|----------|------|------|---------|------|------|------------------|-----|------|------------|------|------|-----------|------|-----|
| | Sector of life | | | Physical | | | Dynamic | | | System relations | | | Endogenous | | | Exogenous | | |
| 1 Social carrying capacity | 1 | 1 | 0,5 | 1 | - | 1 | 1 | 0,5 | - | 0,5 | 0,5 | 1 | 1 | - | 0,5 | 1 | 1 | - |
| 2 Seasonal pressure on society | | | | | | | | | | | | | | | | | | |
| 3 Service and information for tourists | | | | | | | | | | | | | | | | | | |
| 4 Stakeholder involvement | | | | | | | | | | | | | | | | | | |
| 5 Employment | | | | | | | | | | | | | | | | | | |
| 6 Population decline | | | | | | | | | | | | | | | | | | |
| 7 Long-term perspective in policies, projects and marketing | | | | | | | | | | | | | | | | | | |
| 8 Implementations of policies and cooperation projects | | | | | | | | | | | | | | | | | | |
| 9 Capacity to accommodate tourists | | | | | | | | | | | | | | | | | | |
| 10 Community learning | | | | | | | | | | | | | | | | | | |
| 11 Integration of sustainability goals | | | | | | | | | | | | | | | | | | |
| 12 Trail condition | | | | | | | | | | | | | | | | | | |
| 13 Ecological carrying capacity | | | | | | | | | | | | | | | | | | |
| 14 Destination attractiveness | | | | | | | | | | | | | | | | | | |
| 15 Environmental management performance | | | | | | | | | | | | | | | | | | |
| 16 Seasonal pressure on physical environment | | | | | | | | | | | | | | | | | | |
| 17 Local economy | | | | | | | | | | | | | | | | | | |
| 18 Seasonal pressure on local economy | | | | | | | | | | | | | | | | | | |
| Total | 13,0 | 16,5 | 11,0 | 13,5 | 11,0 | 16,0 | 11,0 | 12,0 | 10,0 | 16,0 | 9,5 | 14,5 | 13,0 | 10,5 | 13,5 | 16,0 | 18,0 | 5,5 |

Figure 1: Criteria matrix and diagram shows that indicator variables are representative of the tourism system

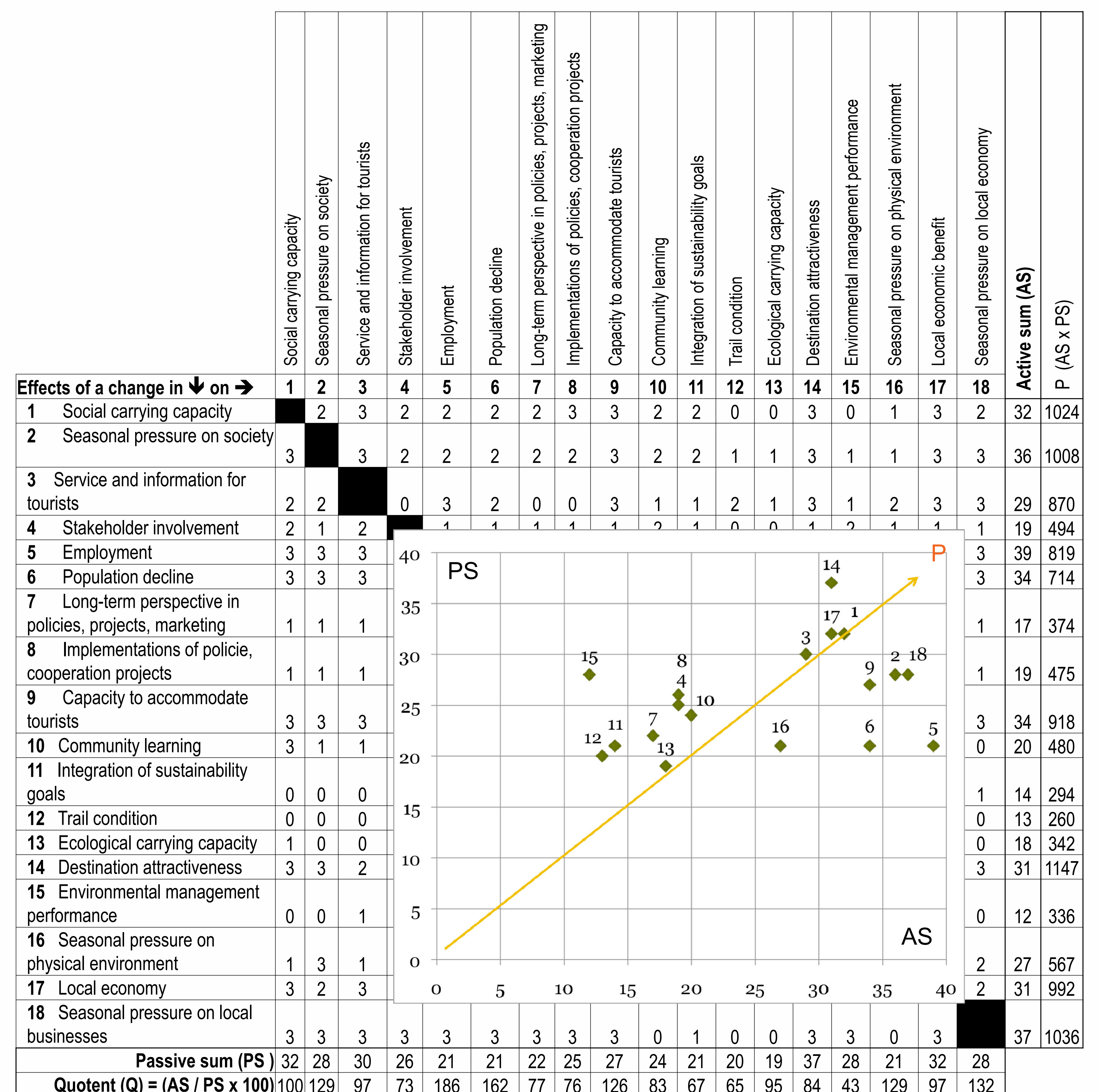


Figure 2: Correlation matrix and effect analysis diagram evaluates interconnectedness between indicator variables

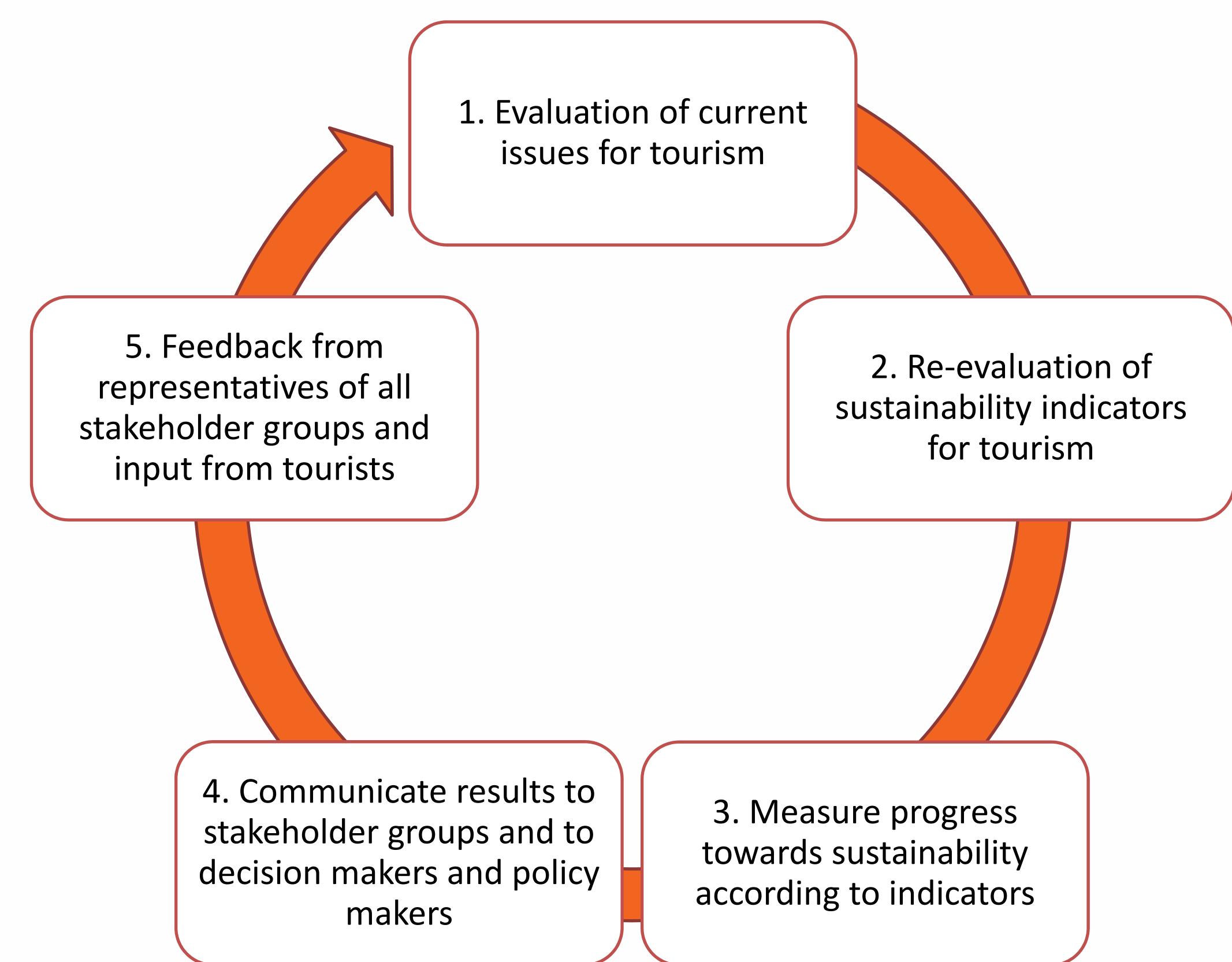


Figure 3: A framework for involving stakeholders in designing indicator variables

Implications

These results will be further used to rank the sustainability indicators obtained by the SIS method according to their importance within the tourism system. A two-dimensional framework would thus include regular stakeholder involvement in re-evaluating both the indicator variables and the usefulness of the monitoring process (figure 3).

References

- Chan, S-L., Huang, S-L. (2004) A systems approach for the development of a sustainable community—the application of the sensitivity model (SM). *Journal of Environmental Management* 72 133–147
- Schianetz, K. & Kavanagh, L. (2008). Sustainability indicators for tourism destinations: A complex adaptive systems approach using systemic indicator system. *Journal of Sustainable Tourism* 16(6): 601-628

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