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# Clustering the Problems of Sustainable Tourism Development in a Destination: Tsaghveri Resort as A Case[*]

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*Abstract: Over the last decades, Tourism has become one of the leading industries in Georgia in terms of generating income, compensation of the country's trade deficit and rising employment of local population. However, tourism lacks development in the mountain region of the country. On-going re-development requires new approaches for the industries' sustainable development. The purpose of the study is to apply the method of transdisciplinary research to identify interrelated core problems hampering sustainable tourism development. The research employed a case study approach. The method was tested at mountain resort of the Caucasus – Tsaghveri (Borjomi Minicipality). The initial information for the research was collected from the data received in the course of fieldwork organized by Austrian University BOKU and Ivane Javakhishvili Tbilisi State University (TSU) in Georgia in July 2018. The study revealed four categories of the destination related problems: leverage, critical, buffering and restricted. The outcome of analysis serves as preliminary information for the problem-solving strategy as well as for making decisions on rational development of destinations. The research gave opportunity to the involved parties to develop skills of participatory research for structuring complex problems.*
*Key words: Sustainable development, Tourism, Problem solving strategy, Transdisciplinarity, Destination planning, System analysis, Mountain resorts*

## 1. Introduction

Over the last decades, Tourism has become one of the leading industries in Georgia in terms of generating income, compensating the country's trade deficit, and increasing employment among local population. Today, the country with 3,7 million population, receives up to 9 million international travelers. (GNTA, 2019), The industry makes up more than 10,4% of country's GDP, holds above 68% in service export contributes 29.5 % in total, in the country's employment (WTTC, 2019).

Tourism is also considered as a strategic sector, recognized for its potential to revitalize and diversify rural areas, particularly in mountain regions, where the unemployment, low incomes, lack of infrastructure, and high migration remain the major challenges.

Georgian Government takes efforts to develop mountainous regions by introducing tax benefits for local entrepreneurs, funding infrastructure development projects, adopting strategies and action plans for their sustainable development (Parliament of Georgia, 2015). One of these areas is Tsaghveri resort, located in the municipality of Borjomi.

Tsagveri was a popular mountain resort among local holiday-makers until collapse of the political regime in the late 20th century. During the last decades of transitional period selected mountain resorts are regaining their popularity. Among them are resorts Borjomi and Bakuriani. Tsagveri destination, located between these resorts, lags far behind them in its development, carrying the burden of inherited social and economic problems and some environmental risks.

The challenges of sustainable tourism development in destinations usually are presented by a set of complex problems. Coping with such challenges requires holistic system approach and analysis. Lack of knowledge about the problems and interrelations between them became a special subject for a system-based trandisciplinary studies (Khokhobaia, 2018). Regarding Georgia, the relevance of study these issues and the first attempts to identify problems in the context of transdisciplinary approaches has been recently initiated. The importance of full scale indebt studies in this regard is well proved by wide range of challenges which are facing the rapidly recovering Georgian tourism destinations (Khelashvili, 2017, 2018).

The purpose of this case study is to apply an innovative transdisciplinary methodology to identify high-leveraged problems challenging the sustainable tourism development in Caucasus region. The identified problems are considered as basic and valuable information to develop a relevant problem-solving strategy.

This research is a part of the project -"Transdisciplinarity for Sustainable Tourism Development in the Caucasus Region | CaucaSusT" funded by the Austrian Development Agency (ADA) in the scope of the Austrian Partnership Programme in Higher Education and Research for Development APPEAR. The project addresses capacity building of universities in Armenia and Georgia in the field of transdisciplinary teaching and research with a focus on sustainable tourism development. The program includes both teaching and field study practices in capacity building process.

In our research we use primary data that was obtained by students during the field study practice in Tsagveri resort in Borjomi municipality. The field practice was organized by Austrian and Georgian partner universities (the University of Natural Resources and Life Sciences/BOKU in Vienna and Ivane Javakhishvili Tbilisi State University/TSU) during July 11 -20, 2018 for master degree students from three departments of TSU: Tourism, Human Geography, and the Physical Geography and Environment Sustainable Development. Faculty professors and PhD students supervised the course (Salukvadze *et al.*, 2018). The purpose of field research was to identify the complex problems in tourism destination, which will serve as preliminary information for the problem-solving strategy as well as for making decisions on rational development of destinations.

The research was based on interdisciplinary approach, involving experts and students of Human Geography, Physical Geography and Environment Sustainable Development. Those disciplines are displayed in Figure 1.

Figure 2 shows local and national stakeholders, University teachers and students, as well as national and international partners involved in the fieldwork covered.

The research applied a quantitative and qualitative analysis design, based on document analysis and semi-structured in-depth individual as well as group interviews with different stakeholders (local actors, representative of Borjomi municipality, community organizations etc.), and visual observations of tourist attractions, infrastructure and facilities.
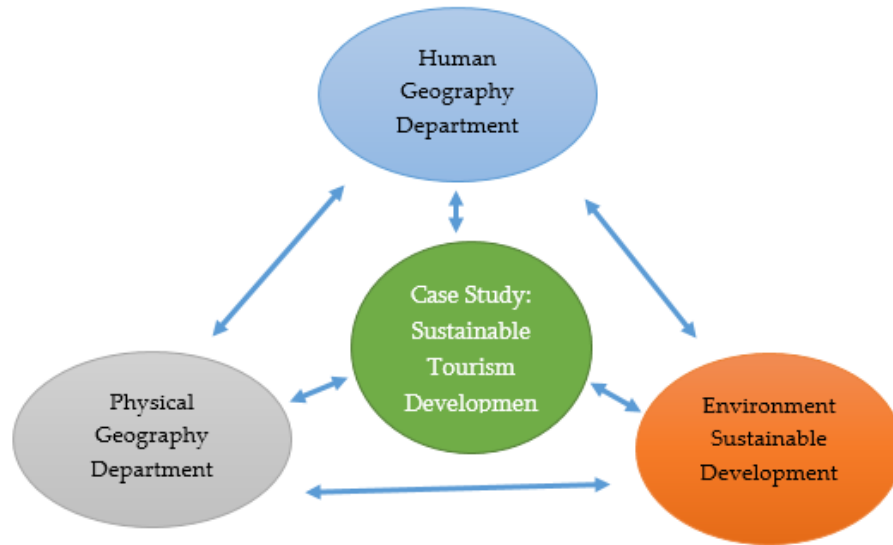
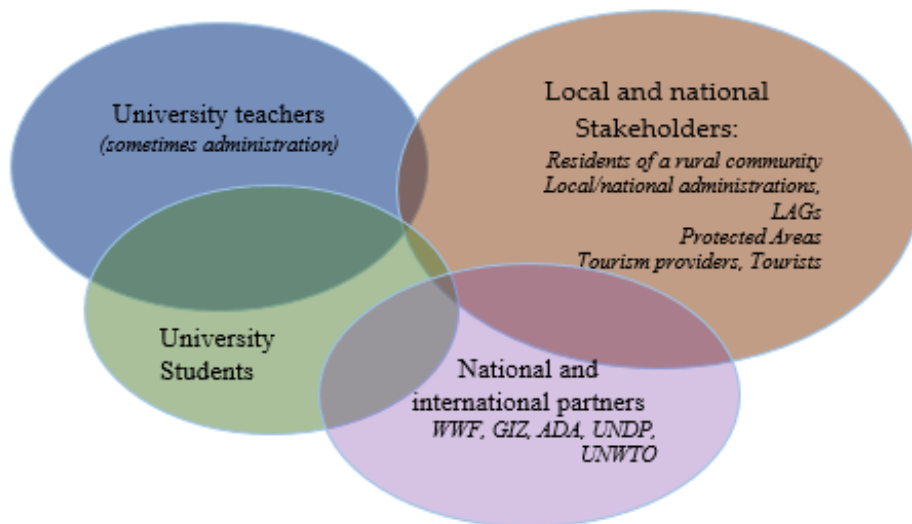Figure. 1. Disciplines involved in transdisciplinary field work.



Figure 2. Actors involved in transdisciplinary case study in Tsagveri.

## 2. Research Methods

The presented study deals with the complex problems which require a relevant system analysis. The challenge of the tourism development in a destination is a complex of inter-related components that are influenced by different factors. They are considered as a system of problems and the applied methodology is a system-based approach.

The identification of interrelated (complex) problems and finding the rational ways of their solution are subjects to recently developed transdisciplinary research methodology that is widely based on the

system-based approach, implies system thinking and knowledge as of its three forms of knowledge (Hadorn et al. 2008; Pohl and Hadorn, 2007).

Transdisciplinary methodology implies three phases of research (Hadorn et al. 2008; Enengel et al. 2012):

- Problems identification and structuring;
- Problem investigation; or Problem analysis
- Problem transformation (implementation); or bringing results to fruition

According to this concept, the research produces relevant forms of knowledge:

- System Knowledge (what is the case?)
- Transformation knowledge (How can the desired knowledge be accomplished?)
- Target Knowledge (what should be achieved?)

The system approach to a research processes was conceptualized in <u>General System Theory</u>. Its "…subject matter is the formulation and derivation of those principals which are valid for "systems" in general (Bertalanffy, 1968). Peter Kheiter, York University professor, defines the system as a set of components that interact with one another and serve for a common purpose or goal; and underlines nine characteristics of the system, such as: 1. Components; 2. Interrelationships; 3.Boundary; 4.Purpose; 5.Environment; 6. Input; 7. Output; 8. Interface; 9.Constrains (Khaiter, 2008) . Based on this approach, the components in our case are presented by "problems" within the boundary of selected destination – Tsaghveri. Most of these "problems" are presumably in a certain direct or indirect relationship – subject to identification and structuring for designing the problem-solving strategy.

Bernhard Freyer, etc, states that system thinking is an absolute necessity to deal with complex problem (Freyer *et al*., 2017). In the context of system thinking, Frischknecht & Schmied, differentiate "Problems" into three categories:  Easy problems - with small number of elements and processes; Complicated problems: with a large number of elements and processes but with stable relation between the elements and almost complete knowledge about the processes; and Complex problems: with many elements and processes, no complete information about the elements, influences, and their interrelations *(Freyer et al*., 2017 ;Frischknecht and Schmied, 2002).

The initial stage of research implied the Soft System Methodology  developed by Peter Checkland, Lancaster University professor, in 70s. (Checkland, 1999). This methodology is also named as System Dynamics – SD  (Rees, 2000) and derived as an oppose to Hard System Methodology (HSM) (Burge, 2015). HSM refers to descriptive reality and well defines problems need to be solved; while SSM means an environment which is messy and poorly defined, outcome is not clear (Rees, 2000; Mehregan et al. 2012). The latter closely reflects the conditions of the study destination.

For the following stages of the research we applied a) system thinking as a prerequisite for System Analysis of interacting entities „…where a small shift in one thing can produce big changes in everything (Meadows, 1999) and b) System-oriented Scenario Technique, which describes an approach for applied research and planning. These approaches lead to development of scenarios on the way forward and to findings of  recommendations for further actions  (Freyer *et al*., 2017).

The system-based methodology, similar to the presented research, was tested in context of urban development (Wirth *et al.,* 2014). The system properties were represented by impact factors that influence current and future system behavior and are likely to impact other elements (p.118). The initial stages of the research implied formation of an impact matrix, the assessment of direct mutual impacts among the defined factors, ranking of the impact variables into active, passive, ambivalent and buffering, which were done with the system grids and system graphs. Unlike our research, the mentioned article is further expended to collaborative scenario analysis by applying methods of functional-dynamic scenario, integrating a loop

analysis of critical system dynamics into the formative scenario analysis to identify the logic of system feedback loops between two or more impact factors.

The role of impact factors in transdisciplinary research process is emphasized by Pohl and Hadron in connection with the research principal named as achievement of effectiveness through contextualization - "Research must therefore pay particular attention to the impact-related contextualization of a project. One way of achieving this is to elaborate an impact model at the stage of problem identification and structuring that shows the social impacts projects may have when bringing results to fruition" (Pohl and Hadorn, 2007).

And last but not least, in context of factors' interrelations, we focused on feedback category in order to describe relations between factors. In part, the approach implies that "The chain of causal connections may be entirely sequential, or it may include loops" (Freyer et al. 2017; Meadows, 1999). Also, each factor may be influenced by other factor and/or it influences another factor. As system elements (components) are mostly interrelated in one way or another, therefore, the change of each such element causes certain leverage effect on the others. From this view, these components are considered as Leverage element or point.

## 2.1. Research tools and terminology

In order to reveal the connections between "problems" we applied an Influence Matrix. Five experts, who participated in the field research, were involved in identification of connections between the "problems". At this stage of our study we used a binary (yes/no) valuation of the connections instead of alternative scoring method. Even though, scoring provides better understanding of the connections, it also increases the risk of biased valuation, which we prefer to avoid in this first case study.

The system analysis methodology implies wide range of special terms, occasionally reflected the same content. In this research we use the terminology proposed by Feyer. In part: "connection" which is the generic term for different types of relationships" in the Influence Matrix; The sum of rows also called the "active sums" shows how strong one element influences the rest of the system; the sum of the single columns, called "passive sums" gives an idea how strongly an element is influenced" (Freyer B, etc, 2017, p. 35). The term Influence Factors (IF) is used as a synonym of the System Elements. IF-s are grouped into active and passive sums and are further divided to:

Leverage elements (problems): high active and low passive sums: These elements have power to trigger a lot of change in your system and are comparable easy to control;

Critical elements (problems): IFs with high active and passive sums. These are important elements, because they are hard to control and can trigger a lot of change and chaos in your system;

Restricted elements (problems): These elements are influenced by a lot of other IFs. This means that, if you want to change them single measures are often not enough, but you should consider more holistic strategies to change them successfully;

Buffer element (problems): Elements with low active and passive sums. These elements stabilize your system. They also can be hard to change. These active and passive sums enable you to group your IFs:

The term "problem analysis" is used with a specific meaning and relates to step-wise analysis of connections between identified "problems". The procedure includes:

Finding the cross-cutting connections between identified "problems" and determining the number of these connections for each of them;

Categorizing the connections of each "problem" into "incoming" and "outgoing" to determine the balance between them, also referred as a leverage capacity;

Categorizing the "problems" by their leverage capacity.

The outcome of this analysis is to determine the category of so called "leverage problems" with smallest amount of "incoming" (passive sum) and largest number of "outgoing" (active sum) connections. They are deemed to have the highest leverage capacity and, assuming other conditions equal, should be considered as primary "problems" to be addressed in a problem-solving strategy.

Based on the reviewed above approaches, methodology and terminology, our research process included three consequent phases: Problem identification and analysis; evaluation of connections between identified problems; and categorizing problems with concentration on loops of "leverage problems".

### 2.2 Limitations of the study

The authors acknowledge some limitations associated with this early-stage transdisciplinary research in Caucasus region. They basically relate to the following concerns: a) the determined connections between problems are not weighted by the level of their influence (no scoring); b) the study does not consider external "Incoming" and "Outgoing" influences on local "problems"; c) The study applies "Problems" which were identified during the first transdiscuiplinary filed research in the Caucasus region, hence the reliability of the finding should be tested by time; finally d) It is assumed that the resolution of any "problem" will produce only positive effect on other connected "problems" without creating new ones. These limitations are subject to further adjustments of the methodology to special case studies.The authors believe that the presented research will contribute into shaping the transdisciplinary methodology for Caucasus region and be useful in addressing the challenges of sustainable tourism development in its destinations.

### 3. Results

### 3.1 Problem identification and analysis

The search applies the range of 17 problems identified by TSU students during the mentioned above fieldwork in Tsaghveri resort in July 2018. Hereinafter, these findings are referred as "problem" or "problems" as an integral part of Tsaghveri tourism destination systems.

Table 1. Identified tourism-related "problems" in Tsagveri resort. Field work results (2018).

| # | Identified Problems |
|---|---|
| 1 | Poorly developed infrastructure |
| 2 | Accessibility to regular transport |
| 3 | Lack of tourism facilities |
| 4 | Insufficient tourism product/experiences |
| 5 | Seasonality |
| 6 | Non-competitive local products |
| 7 | Scarce choice of food etc. |
| 8 | Shortage of local qualified personnel, local capacity |
| 9 | No cooperation among entrepreneurs |
| 10 | Weak regional partnership |
| 11 | Insufficient involvement of local population in development processes |
| 12 | Non-existence of long-term vision of the destination development |
| 13 | Safety and security |
| 14 | Difficulties of getting loans, high interest rates |
| 15 | Lack of small enterprises, local producers and proper packaging and labeling of local products |
| 16 | Lack of service/business consultations |
| 17 | Lack of tourist information (web site), no marketing and branding |

*(1) Identification of connections between the "problems"*

This step implies a peer review of identified "problems" to determine connection between them in a binary manner (Yes/No, or in case – 1/0). For this purpose, all identified "problems" were arranged in so

called "Influence Matrix". Further, five experts involved in the fieldwork marked the connected "problems" in relevant cross cutting cells. Produced matrix-table shows the whole net of connections between the "problems", as well as the number of such connections which carries each identified "problem". The sum of active connections can be viewed as an indicator of each "problem's'" capability to influence the overall conditions in case of their resolution. In table 2, the Passive sum of connections shows the level of influence that each "problem" has from other "problems" of the destination. Note: the "problems" are represented by the assigned relevant numerical numbers.

Table 1. Assessments of inter-relations between the identified "Problems".

Column key (Cause/Effect):
1. Poorly developed infrastructure
2. Accessibility to regular Transport
3. Lack of tourism infrastructure
4. Insufficient tourism product/experiences
5. Seasonality
6. Non-competitive local products
7. Scarce choice of food etc.
8. Shortage of local qualified personnel, local capacity
9. No cooperation among entrepreneurs
10. Weak regional partnership
11. Insufficient involvement of local population in development processes
12. Non-existence of long-term vision of the destination development
13. Safety and security
14. Difficulties of getting loans, high interest rates
15. Lack of small enterprises local producers and proper packaging and labeling of local products
16. Lack of service, consultations and
17. Lack of tourist information (web site), no marketing and branding
Sum = Sum of influence (or "out-going", or "out-flow", or "Active") links

| # | Problem | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | Sum |
|---|---------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|-----|
| 1 | Poorly developed infrastructure | | 1 | 1 | 1 | | | | | | | 1 | 1 | 1 | | | 1 | | 7 |
| 2 | Accessibility to Regular Transport | | | 1 | 1 | 1 | | | | | | 1 | | | | 1 | | | 4 |
| 3 | Lack of tourism facilities | 1 | | | 1 | 1 | 1 | | | | | 1 | | | | | 1 | | 6 |
| 4 | Insufficient tourism product/experiences | | | | | 1 | | | | | | 1 | | | | 1 | 1 | | 4 |
| 5 | Seasonality | | | 1 | | | 1 | 1 | | | | 1 | | | | | | 1 | 5 |
| 6 | Non-competitive local products | | | | 1 | 1 | | | 1 | | 1 | 1 | | | | 1 | | | 6 |
| 7 | Scarce choice of food etc. | | | | | 1 | 1 | | | | | 1 | | | | | | | 3 |
| 8 | Shortage of local qualified personnel, local capacity | | | 1 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | 1 | 1 | 1 | 10 |
| 9 | No cooperation among entrepreneurs | | | 1 | | | 1 | 1 | 1 | | 1 | 1 | | | 1 | | 1 | 1 | 9 |

| # | Problem | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | Weak regional partnership | | 1 | 1 | 1 | | 1 | | | 1 | | 1 | 1 | | | | 1 | 1 | 9 |
| 11 | Insufficient involvement of local population in development processes | 1 | 1 | | | | | | 1 | 1 | | | 1 | | | | | | 5 |
| 12 | Non-existence of long-term vision of the destination development | 1 | 1 | 1 | | | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 13 |
| 13 | Safety and security) | | | | 1 | | | | | | | | | | | | | | 1 |
| 14 | Difficulties of getting loans, high interest rates | 1 | | | 1 | | 1 | 1 | | | | | | | | 1 | | | 5 |
| 15 | Lack of small enterprises, , local producers and proper packaging and labeling of local products | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | | | 1 | | 9 |
| 16 | Lack of service/business consultations | | | | | 1 | 1 | | 1 | 1 | 1 | | 1 | | 1 | 1 | | 1 | 9 |
| 17 | Lack of tourist information (web site), no marketing and branding | | | | | 1 | 1 | | | | | | 1 | | | | | | 3 |
| | Sum of "in-coming" (or "influenced", or in-flow, or Passive) links | 4 | 3 | 5 | 10 | 10 | 10 | 4 | 5 | 6 | 7 | 11 | 6 | 2 | 4 | 7 | 8 | 6 | |

In Table 3 the results of experts survey are sorted by revealed number of "passive" ("in-coming) and "active" ("outgoing") connections with indication of numerical number of each "problem".

The table visualizes importance of each "problem" measured by total number of both incoming and outgoing connections, thus, revealing the so called "Critical Elements" of the system (Freyer *et al.*, 2017). Even though the Critical Elements' (or "problems" in case) potential to fuel changes is high, their solutions, in turn, are widely depended on the status of many other "problems" of the destination. Therefore, giving priority to their resolution may not be the best scenario for improving the overall conditions in the destination.

Table 3. Numerical numbers of connections (in-coming, out-going and inter-linked) between the "problems".

| Pr. ## | | | | | | | | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 1 | 10 | 11 | 15 | 16 | 17 | 1 | 2 | 3 | 6 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 19 |
| 16 | 1 | 3 | 4 | 8 | 9 | 10 | 12 | 15 | 5 | 6 | 8 | 9 | 10 | 12 | 14 | 15 | 17 | | | 17 |
| 10 | 6 | 8 | 9 | 11 | 12 | 15 | 16 | 2 | 3 | 4 | 6 | 9 | 11 | 12 | 16 | 17 | | | | 16 |
| 15 | 2 | 4 | 6 | 8 | 12 | 14 | 16 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 16 | | | | 16 |
| 6 | 3 | 5 | 7 | 9 | 10 | 12 | 14 | 15 | 16 | 17 | 4 | 5 | 8 | 10 | 11 | 15 | | | | 16 |
| 11 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 1 | 2 | 9 | 10 | 12 | | | | 16 |
| 5 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 15 | 16 | 17 | 3 | 6 | 7 | 11 | 17 | | | | | 15 |
| 8 | 6 | 9 | 12 | 15 | 16 | 3 | 4 | 5 | 9 | 10 | 11 | 14 | 15 | 16 | 17 | | | | | 15 |
| 9 | 8 | 10 | 11 | 12 | 15 | 16 | 4 | 6 | 7 | 8 | 10 | 11 | 14 | 16 | 17 | | | | | 15 |
| 4 | 1 | 2 | 3 | 6 | 8 | 9 | 10 | 13 | 14 | 5 | 11 | 11 | 15 | 16 | | | | | | 14 |
| 1 | 3 | 11 | 12 | 14 | 3 | 4 | 5 | 11 | 12 | 13 | 16 | | | | | | | | | 11 |
| 3 | 1 | 5 | 8 | 10 | 12 | 1 | 4 | 5 | 6 | 11 | 16 | | | | | | | | | 11 |
| 14 | 8 | 9 | 12 | 16 | 1 | 4 | 6 | 7 | 15 | | | | | | | | | | | 9 |
| 17 | 5 | 8 | 9 | 10 | 12 | 16 | 6 | 7 | 12 | | | | | | | | | | | 9 |
| 2 | 10 | 11 | 12 | 4 | 5 | 11 | 15 | | | | | | | | | | | | | 7 |
| 7 | 5 | 9 | 14 | 15 | 5 | 6 | 11 | | | | | | | | | | | | | 7 |
| 13 | 1 | 12 | 4 | | | | | | | | | | | | | | | | | 3 |

*(2) Dividing connections of each "problem" into "incoming" and "outgoing, and determining the Leverage capacity.*

The next step implied determining of difference between "Incoming" and „Outgoing" links for each "problem" referred as "leverage capacity". Table 4 shows the amount of links by categories and in total.

Table 2. The amount of links by categories and in total (top-down sorted).

| ## | Name of "Problem" | Out-going | in-coming | Difference between In-coming and Outgoing | Total (Incoming+Outgoing) |
|---|---|---|---|---|---|
| 12 | Non-existence of long-term vision | -6 | 13 | 7 | 19 |
| 16 | Lack of extension service/business consultations for producers, entrepreneurs | -8 | 9 | 1 | 17 |
| 10 | weak regional partnership (no links with Bakuriani resort (2023 Freestyle Ski and Snowboard World) | -7 | 9 | 2 | 16 |
| 6 | Non-competitive local products (high prices for the local market) | -10 | 6 | -4 | 16 |
| 15 | lack of small enterprises, local producers and proper packaging and labelling of local products | -7 | 9 | 2 | 16 |
| 11 | Insufficient involvement of local population (community members in development processes) | -11 | 5 | -6 | 16 |
| 5 | Seasonality | -10 | 5 | -5 | 15 |
| 8 | Shortage of local qualified personnel, local capacity (no business agreement, planning etc.) | -5 | 10 | 5 | 15 |
| 9 | no cooperation among entrepreneurs (mistrust between locals) | -6 | 9 | 3 | 15 |
| 4 | Insufficient tourism product/experiences (new and diverse offers ) | -10 | 4 | -6 | 14 |
| 1 | Poorly developed infrastructure (water, gas, electricity, sewerage, banks, pharmacy) | -4 | 7 | 3 | 11 |
| 3 | lack of tourism infrastructure (café, entertainment centers, TIC, road signs) | -5 | 6 | 1 | 11 |
| 17 | Lack of tourist information (web site), no marketing and branding | -6 | 3 | -3 | 9 |
| 14 | Difficulty of getting small loans, high interest rates | -4 | 5 | 1 | 9 |
| 7 | scarce choice of food etc. | -4 | 3 | -1 | 7 |
| 2 | Accesibility (regular transport) | -3 | 4 | 1 | 7 |
| 13 | safety and security (lack of fast emergency and police services) | -2 | 1 | -1 | 3 |

*(3) Categorizing the "problems"*

Prime question for stakeholder regarding the sustainable development of challenged destinations is to determine the rational starting actions in a problem solving strategy. Figure 3 expresses identified connections between the "problems" in Tsagveri destination clearly demonstrates complexity and ineffectiveness of their simultaneous consideration in the decision-making process.
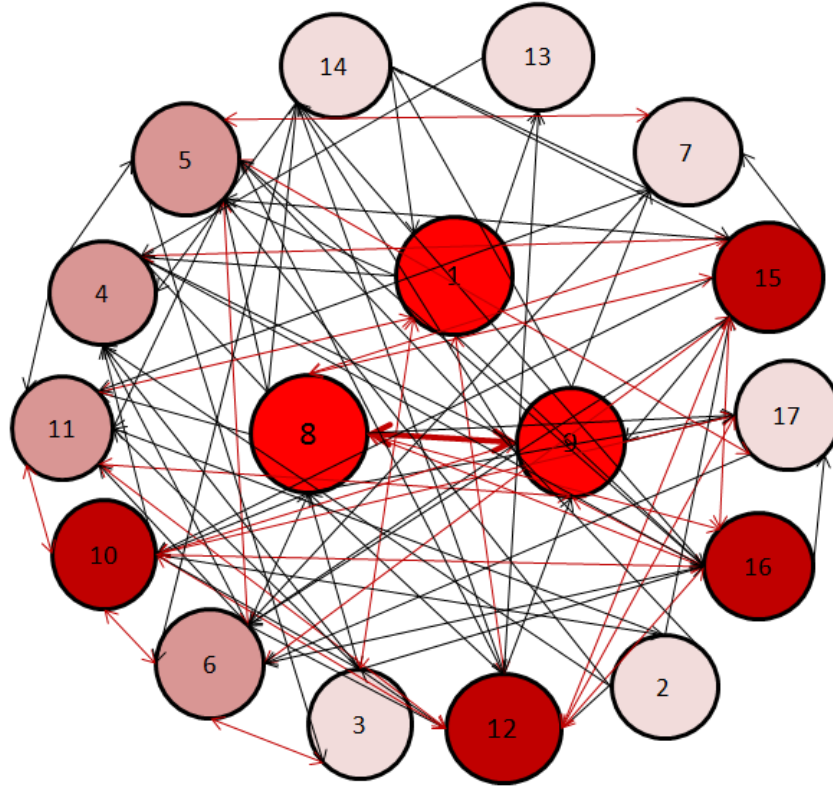


Figure 3. Identified connections between "problems" in Tsaghveri destination.

Therefore, further action to cluster the "problems" into manageable amounts is required. In this line, the final step of the analysis is to categorize the "problems" according to their leverage potential. Figure 4 shows implemented analysis by applying a scatter graph with four quadrants for the allocation of "problems" into four categories. The graph differentiates the following categories:

"Leverage Problems" which have below average number of incoming connections (are less influenced by other "Problems") and above average outgoing connections (meant higher influence on others "Problems).They are located in NE section of the graph and falls in category of Leverage Elements per Freyer (Freyer *et al.,* 2017: 35; Meadows, 1999: 6; Active impact factors per Wirth, 2013: 122;). Table 5 displays the leverage problems.
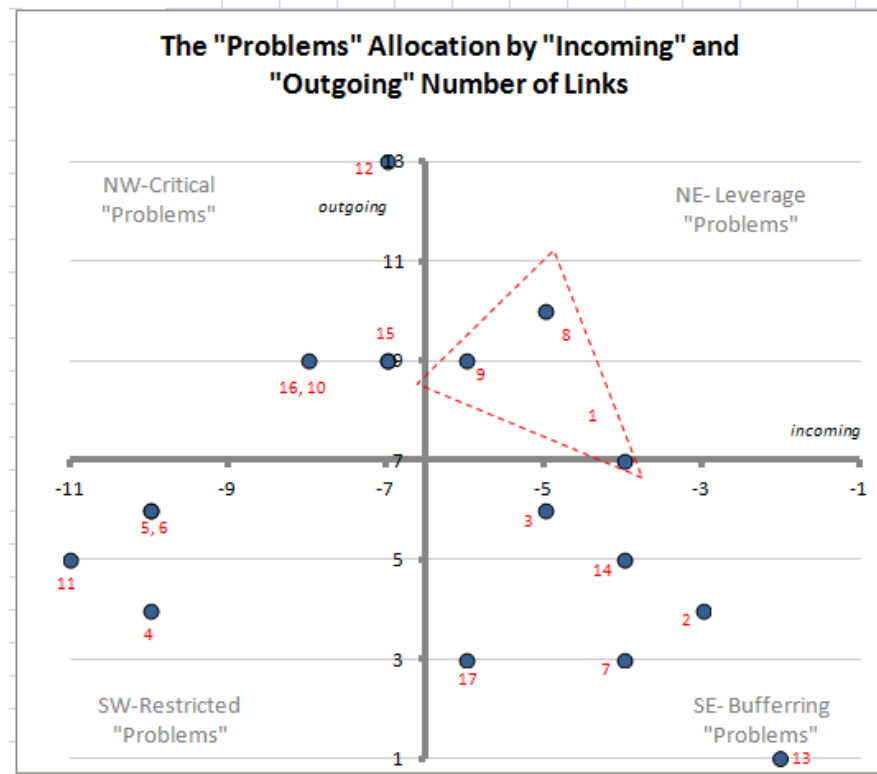
Figure. 4. Categories of identified "problems".

Table 3 Leverage problems.

| Leverage Problem # | Problem name |
|---|---|
| 8 | *Shortage of local qualified personnel, local capacity (no business agreement, planning etc.)* |
| 9 | *no cooperation among entrepreneurs (mistrust between locals)* |
| 1 | *Poorly developed infrastructure (water, gas, electricity, sewerage, banks, pharmacy)* |

"Critical Problems" which have above average number of both incoming and outgoing connections, are located in NW section of the graph, and falls in category of "Critical Elements per Freyer (Freyer B, etc, 2017,p.35, and "Ambivalent factors per Wirth, 2013, p.122);

"Restricted Problems" which are most sensitive and reactive, having below average number of outgoing connections and above average incoming connections, are located in SE section of the graph and belong to category of Restricted Elements per Flyer (Freyer B, etc, 2017 p.35); Passive factors (Wirth, 2013,p.122)

"Buffer Problems" which have less than average number of both outgoing and incoming connections, are located in SW section of the graph and considered as Buffer Elements per Freyer (Freyer *et al.,* 2017: 35; Wirth, 2013:122; Meadows, 1999: 7).

The rational way to plan a problems solving strategy for the destination is to start with addressing the "Leverage Problems" with highest leverage potential (SE section). The "Leverage Problems" model implies that resolution of each of them will most effectively lead to mitigation of the others, and further it will diminish the remaining problems as well. This outcome of the research is considered to be valuable and applicable information for experts and managers to prioritize actions based on the chain-effect scenarios. In the case study the findings are as follows:

The "Leverage Problems": (also referred as "Active" or "High-leverage") includes: "Poorly developed infrastructure (water, gas, electricity, sewerage, banks, pharmacy)" (#1); Shortage of local qualified personnel, local capacity (no business agreement, planning etc.)(#8); and "No cooperation among entrepreneurs (mistrust between locals) (#9)". The links between them show that the latter two are directly inter-connected, meaning that the resolution of one of them will directly and positively influence on the other. Unlike these "problems", development of the infrastructure depends on external to the destination factors (is less pre-determined by local factors). However, its resolution will produce a wide positive effect in the resort area. In general, it is assumed that the resolution (mitigation) of all three "Leverage Problems" should be considered as primary objectives in a problem-solving strategy;

"Critical Problems" (also, referred as "Ambivalent") are represented by: "Weak regional partnership (no links with Bakuriani resort - 2023 Freestyle Ski and Snowboard World)" (#10); "Non-existence of long-term vision (#12)"; "Lack of small enterprises, local producers and proper packaging and labeling of local products (#15)"; "Lack of extension service/business consultations for producers, entrepreneurs (#16)". They all are inter-related "Problems", except the "Weak regional cooperation" (#10) which is not considered to be directly influenced by "Lack of small enterprises…" (#15) and "Lack of extension business service and consultations…" (#16). In reverse, these two "Problems" together with the absence of the "Vision…" (#12) participate in creation of "Week regional partnership problems…" (#10). Meanwhile, the resolution (or mitigation) of "Leverage Problems" related to a "Lack of quality of staff" (#8) and "No Cooperation among entrepreneurs" (#9) will first of all lead to extension of "Regional cooperation…" (#10). In addition, the positive changes in the same "Leverage Problems" along with such changes in "Poor infrastructure…." (#1) will directly contribute into "Extension of business services and consultations… (#16). The direct positive impact on "Lack of small enterprises…" (#15) is expected from the improvement of "Staff quality…" (#8), development of "Vision…" (#12), and "Improvement of infrastructure…" (#1). In case the mentioned above "Critical Problems" are addressed, it is expected that all other "Problems" of the whole system will receive positive impact through combined 37 direct connections deriving from these 4 "Critical Problems".

"Restricted Problems" and "Buffering Problems" (Also, mentioned as "Passive") are introduced by 10 components of the system, including 4 "Restricted" and 6 "Passive" ones. They make up majority of the system (10 out of 17), however, their resolution carries limited (below average) potential to positively influence on the overall situation and are more or less depended on mitigation of the other "problems".

The clustering of the "Problems" provides information for first-approach determination of the sequence (steps) in problem solving strategy. In the case study it starts with improvement of infrastructure, upgrading qualification of local business community and development of partnership among local entrepreneurship. This stage will assumedly help to resolve standing "Critical problems", which in turn produce the maximum positive effect on improving the conditions for sustainable tourism development in one of the Caucasus mountain destination – Tsagveri.

## 4. Discussion and Conclusions

While a destination related problems usually are well realized by affected businesses and stakeholders as a standing alone challenges (occasionally along with the noticeably and directly related other

problems), it is virtually impossible to understand the whole web and structure of their relations without special scientific research. Hence, understanding of these connections is considered as important and even necessary knowledge for making decisions on problem-solving strategy and rational development of destinations.

As can be seen, the proper combination of triple-bottom transdisciplinary approach with the system analyses methodology and with the relevant research techniques, allowed executing a combined study of social, economic and environmental challenges of sustainable development in a destination. Specifically, the applied 3-step methodology – determination and classification of links between initially identified "Problems" of a destination; sorting them by number of connections and balance of incoming/outgoiag connections; followed by clustering the problems and identification of those with highest leverage potential – produces valuable results for planning a problem-solving strategy. It is expected that the mentioned above methodology with common system analysis approach, would need certain adjustment in studies of a specific tourism destinations.

The given research was focused on "Problems" representing a kind of "Factor" in the commonly used dynamic system concepts. We applied a bi-nominal matrix to identify connections between the "Problems", instead of commonly used matrix with scoring these connections (Wirth et al. 2014; Freyer et al. 2017) The applied bi-nominal matrix simplifies the results but reduces the risk of incorrect answers by less or inexperienced in market economy business respondents and stakeholders. Some modification has been made in clustering the "Problems" and expressing the results in quadrant (system grid) graphs, in order to emphasize the role of high-leveraged "problems" in the case study.

In practical terms, the determined inter-relations between the identified "Problems" and their priority sequencing for the development of sustainable tourism in the study area are viewed as typical for mountain and, in some cases, special for the Caucasus regions. These features are mainly due to transitional processes of local social and economic conditions, along with typical for mountain regions ecologically sensitive environment. Poorly developed infrastructure, as a prime problem (#1), looks typical for mountain areas (Wirth, 2013), but has a special importance in countries with still emerging economy, lacking of sufficient resources for the development of costly infrastructure in remote mountain destinations. In addition, the natural environment and complicated relief of mountain landscapes boosts the cost of infrastructure, like everywhere in the World. The other two "Leverage Problems" – "Shortage of local qualified personnel…" (#8), and "No cooperation among entrepreneurs…" (#9)", currently can also be considered as more specific for Caucasus destinations, which are part of countries with emerging marketing economy and with roots in centrally-planned one. This transition status well explains the lack of experience among local population in doing business under the developing rules of market economy, free market competitive environment, and needs in marketing activities. The regional specifics are further emphasized by ambivalent "Critical Problems", which are logical extension of the "Leverage Problems". The weak regional cooperation (#10), absent of long-term vision (#12), lack of small enterprises…" (#15) and of extensive service/business consultations for entrepreneurs (#16) in combination are specific attributes for economically underdeveloped and remote maintain areas. We believe that the same approach can be applied in other destinations of Caucasus region as well.

According to a scatter graph insufficient tourism products/experiences, non-competitive local product, and lack of involvement of local population belong to the category of restricted problems of long-term solution. Likewise, the mitigation of seasonality problem is also considered as a time-consuming process connected with the development of off-season tourism services. Numerous "Buffering Problems" such as accessibility of local transport services, scarcity of food supply, safety and security issues, difficulties of taking loans, lack of tourism facilities, and the relevant marketing information on the

destinations are broadly depended on general progress in the destination. Thus, they are considered as "passive" component in the problem-solving strategy.

### Conflicts of Interest
The authors declare no conflict of interest.

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