SEÇÃO / SECTION / SECCIÓN
ESTUDO DE CASO / CASE STUDY / CASO DE ESTUDIO

EXPLORING RELATIONSHIP BETWEEN CONTROLLABLE METRICS AND SOCIO-ENVIRONMENTAL PERFORMANCE INDICATORS IN RESPONSIBLE TOURISM CONTEXT USING TEMPORAL CAUSAL MODEL

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Abstract

This study explores relationship between the controllable issues in responsible tourism and the key socio-environmental performance indicators, using the Temporal Causal Modeling (TCM) approach. TCM uses an autoregressive approach to build a causal model for a specified set of target series from a set of candidate inputs. Unlike the conventional time series, modeling TCM does not use an explicit predictor. TCM is likely to identify the controllable inputs that have maximum impact on key performance indicators. The study used 5-year time series data (2014-2018) on socio-environmental performance indicators in Indian tourism context and normalized controllable metrics related to responsible tourism. The analysis identified restoration programmes, recycling & reusing products, biological conservation, ecological carrying capacity and ethno-cultural advocacy as controllable metrics of responsible tourism and found to share significant relationship with 10 socio-environmental key performance indicators. The analysis identified restoration programmes, recycling & reusing products, biological conservation, ecological carrying capacity and ethno-cultural advocacy as controllable metrics of responsible tourism and found to share significant relationship with 10 socio-environmental key performance indicators.

Key words: Responsibility; Sustainability; Causal; Indicators; Controllable; Tourism.

EXPLORANDO A RELAÇÃO ENTRE MÉTRICAS CONTROLÁVEIS E INDICADORES DE DESEMPENHO SOCIOAMBIENTAL NO CONTEXTO DO TURISMO RESPONSÁVEL, UTILIZANDO O MODELO CAUSAL TEMPORAL

Resumo

Este estudo explora a relação entre as questões controláveis no turismo responsável e os indicadores-chave de desempenho socioambiental utilizando a abordagem de Modelagem Causal Temporal (MTC). A MTC usa uma abordagem autoregressiva para construir um modelo causal para um conjunto específico de séries-alvo a partir de um conjunto de entradas candidatas. Ao contrário das séries temporais convencionais, a modelagem de MTC não utiliza um preditor explícito. É provável que a MTC identifique as entradas controláveis que têm o máximo impacto sobre os indicadores-chave de desempenho. O estudo utilizou dados de séries temporais de 5 anos (2014-2018) sobre indicadores de desempenho sócio-ambiental no contexto do turismo indiano e métricas normalizáveis controláveis relacionadas ao turismo responsável. A análise identificou programas de restauração, reciclagem e reutilização de produtos, conservação biológica, capacidade de carga ecológica e defesa etnocultural como métricas controláveis do turismo responsável e descobriu que compartilhava uma relação significativa com 10 indicadores-chave de desempenho sócio-ambiental. A análise identificou programas de restauração, reciclagem e reutilização de produtos, conservação biológica, capacidade de carga ecológica e defesa etnocultural como métricas controláveis do turismo responsável e descobriu que compartilhava uma relação significativa com 10 indicadores-chave de desempenho sócio-ambiental.

Palavras-chave: Responsabilidad; Sostenibilidad; Causal; Indicadores; Controlable; Turismo.

ESTUDIANDO LA RELACIÓN ENTRE LA MÉTRICA CONTROLABLE Y LOS INDICADORES DE DESEMPEÑO SOCIO-AMBIENTAL EN EL CONTEXTO DEL TURISMO RESPONSABLE UTILIZANDO UN MODELO CAUSAL TEMPORAL

Resumen

En este estudio se explora la relación entre las cuestiones controlables en el turismo responsable y los principales indicadores de desempeño socioambiental mediante el enfoque del Modelo de Causas Temporales (MTC). El MTC utiliza un enfoque autorregresivo para construir un modelo causal para un conjunto específico de series de objetivos a partir de un conjunto de insumos candidatos. A diferencia de las series temporales convencionales, el modelado TCM no utiliza un predictor explícito. Es probable que la MTC identifique los insumos controlables que tienen un impacto máximo en los indicadores clave de rendimiento. Se han utiizado datos de series cronológicas de cinco años (2014-2018) sobre indicadores de resultados socioambientales en el contexto del turismo de la India y métricas controlables normalizadas relacionadas con el turismo responsable. En el análisis se identificaron los programas de restauración, el reciclado y la reutilización de productos, la conservación biológica, la capacidad de sustentación ecológica y la promoción etnocultural como parámetros controlables del turismo responsable y se comprobó que guardaban una relación significativa con 10 indicadores clave de rendimiento socioambiental. En el análisis se identificaron los programas de restauración, el reciclado y la reutilización de productos, la conservación biológica, la capacidad de sustentación ecológica y la promoción etnocultural como parámetros controlables del turismo responsable y se comprobó que guardaban una relación significativa con 10 indicadores clave de rendimiento socioambiental.

Palabras clave: Responsabilidad; Sostenibilidad; Causal; Indicadores; Controlable; Turismo.

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1 INTRODUCTION

Travel and tourism has been accepted as a universal growth driver with its mercurial performance over the years. In 2018, the travel and tourism sector registered a growth of 3.9%, second only to the manufacturing sector (4.0%).

The tourism sector accounted for 8.8 trillion USD which equated to 10.4% of the global GDP in 2018. The sector outpaced overall economy growth for the eighth consecutive year. China and USA together accounted for 35.2% of the global Travel & Tourism GDP followed by Japan, Germany and the UK. This sectoral surge has been attributed to the exponential increase in domestic travel in the major economies.

The domestic tourism in the five largest Travel & Tourism economies of the world (USA, China, Japan, Germany and the UK) accounted for at least 80% of the total Travel & Tourism spending. WTTC (2019) forecasted that the growth trend is likely to prevail over the next decade with Asia emerging as 'the choicest continent to visit'.

It was further projected that 67 million 'new travelling households are expected in China, followed by India with 14 million and the USA with 9 million. China is expected to account for 35% of the worlds absolute change in Travel & Tourism GDP during 2018-29, followed by the USA (11%) and India (6%).

In its annual analysis quantifying the global economic and employment impact of Travel & Tourism in 185 countries and 25 regions, the World Travel & Tourism Council's (WTTC) research revealed that the sector accounted for 10.4% of global GDP and 319 million jobs, or 10% of total employment in 2018.

The division of overall spend is firmly weighted towards the leisure market, which represented 78.5% of the total compared with 21.5% for business spend, and the sector accounted for 6.5% of total global exports and 27.2% of total global service exports.

Domestic tourism, which represented 71.2% of all tourism spending in 2018 and had the strongest growth in developing nations, continued to support opportunities by spreading development and regional economic benefits and building national pride. India ranked 8th globally with contribution of 247 US$ from travel and tourism sector to national GDP.

The growth of travel and tourism is not without collaterals posing threats to environment, society and the ethno-cultural fabric. Concern over the ecological and social environments has propagated research debate on tourism-environment relationship.

The debate gained momentum in the early part of 1970s (Young, 1973; Kasper, 1973) and was carried through in the 1980s whereby the operational aspects of mass-tourism were put to question in the context of ecological and biodiversity intervention (Krippendorf, 1984).

By the middle 1990s the call for a behavioural and attitudinal shift in the travellers clearly reflected in the empirics (Butler, 1995) and a number of nomenclature (alternative tourism, minimum-impact-tourism, ecotourism etc.) surfaced.

Assigning the term 'sustainability' in the tourism perspective, following the Bruntland Report (1987) assumed significant proportion (Inskeep, 1991) and five major criteria for 'sustainable tourism' were identified, namely, economic, environmental and social responsibility of tourism as well as its responsibility towards tourists (visitor satisfaction) and global justice and equity.

Sustainability assumed critical strategic objective for the policy makers. Sustainability indicators were formulated and the global bodies like United Nations Environmental Programme (UNEP), World Travel & Tourism Council (WTTC) and United Nations World Travel Organization (WTO) got together to prioritize the action plan.

However, the notion of sustainability in the context of tourism sector has received much criticism for lack of viable models (Higgins-Desbiolles, 2010; Chettiparamb and Kokkranikal, 2012) and by the early part of the new millennium the research focusing sustainable tourism and actions have been accompanied by the notion of responsible tourism (Leslie, 2012a; Goodwin, 2011).

The initiatives for sustainability was often unidimensional in nature with the onus lying predominantly on the policy makers, facilitating agencies and the tourism service providers. The host community was relatively inert.

A number of measurement instruments were also designed to assess the gaps between 'claimed-sustainability' and 'experienced-sustainability' (ECETAT & ECOTRANS, 2004; TSG, 2007; UNWTO, 2004) which were primarily based on the 'three-pillar approach (environmental, socio-cultural and economic) (UNWTO, 2004).

But they did not address the issues of visitor-host interaction and responsible behavioural & attitudinal pattern of the same and consequently failed to capture the notion of 'sustainability' comprehensively.

The Cape Town Declaration (2002) approached the sustainability issue from a different perspective. The host community and the visitors were identified to be engaged in symbiotic relationship with shared responsibility.

The notion of responsible tourism was set to trigger a measurable behavioural shift amongst the stakeholders involved in tourism-transcations and reduce the gaps between 'sustainable policies' and

alarmingly slow adoption of responsible travel behaviour.

The business case for responsible tourism focuses on building adaptive approaches and directing resources towards the perceived demands of relevant stakeholders. Businesses may be in a better position to understand the true bases of company productivity as they collaborate with stakeholders across profit and non-profit boundaries (Porter and Kramer, 2011).

In addition to induce the targeted responsible behavioural and attitudinal shift amongst the tourism stakeholders, the issue of 'responsible destinmation' also surfaced with an underlying service-design concept by integrating all controllable metrics of responsible travel behaviour that could be embedded in the design itself to offer tourism products.

However, the travel and tourism business have a dilemma in identifying the controllable factors of responsible tourism that are apprehended to have profound impact on the performance of socio environmental indicators.

2 LITERATURE REVIEW

2.1 Sustainability Issues in Tourism

The sustainability issues identified and analysed in the context of tourism industry had its own empirical research support over the years.

It corroborated findings focusing on engagement of diverse stakeholders involved in tourism transactions (Ramon-Hidalgo and Harris, 2018; Adu-Ampong, 2017; Molina-Azorín and Font, 2016); collaboration and netwoks between stakeholders (Stoddarta et al, 2019); host-community support in destination planning (Choi and Murray, 2010), behavioural intentions of tourists (Jimenez-Barreto et al, 2020; Olya et al, 2018), involvement of stakeholder in planning sustainable tourism framework (Xue and Kerstetter, 2018), preservation of ethno-cultural community values and customs (Yang et al, 2014) and governance & leadership (McGhee et al, 2015).

Arbogast et al (2020) reviewed the concept 'rural tourism' as a premise to manifest sustainable tourism (Lane and Kastleholz, 2015) and advocated the transdisciplinary social-designing approach in creating experiential tourism as means to sustainability.

Sustainable tourism approach also incorporated environmental supply components, namely, natural features, physical attributes, management initiatives and/or governance policies that influence environmental conservation for visitor-centric sites and, therefore, will include the ecosystems and services of the destination, visitor education and interpretive programs, zoning and access, environmental impact assessment (EIA) procedures and policies & guidelines (McNicol, 2016).

The multi-stakeholkder approach to sustainable tourism opened up avenues to explore behavioural realignment across 'responsible' dimensions.

Academic contributors have been shaping the concept of responsible tourism as an antecedent to realize the sustainability agenda (Bramwell et al, 2008; Buckley, 2012; Camilleri, 2014; Goodwin, 2011; Lee et al, 2013; Sharpley, 2014; UNWTO–UNEP, 2012).

Responsible tourism practices can contribute to nullify the perils of climatic shift and can provide an actionable scarce resource management (Frey and George, 2010; Iglesias et al., 2007).

Responsible tourism started gaining its popularity during the 1980s as offshoot or spin-off concept of sustainable tourism (Krippendorf, 1987). Initially, the academia and the practitioners were apprehensive about its application in the business domain. In fact, Wheeller (1991), Cooper and Odzil (1992) etc. observed that responsible tourism was as an act of elitism and hedonism that assuaged the guilt of the educated, affluent tourists.

The fact that responsible tourism could be a mechanism for balancing out economy and ecology was observed at a much later stage as the researchers found evidence that community-based responsible tourism mat be posited as viable model to improve the quality of life of the host community (Chiu et al., 2014; McIntyre, 1993).

Reinforcing the theory, Crouch and Ritchie (1999) suggested that the concept of sustainable tourism sought the consensus of all segments of society (including local populations), so that the tourism industry and other resource users can coexist together for a thriving economy.

2.2 Responsible tourism as a route to sustainability

Responsible tourism got a shape through the Cape Town Declaration (2002) whereby seven major focal areas were identified:

a) minimization of negative economic, environmental and social impacts,
b) generating greater economic benefits for local people and enhancing the well-being of host communities,
c) improving working conditions and access to the industry,
d) involving host community in decision making that affect their lives and life chances,
e) making positive contributions to the conservation of natural and cultural heritage and global diversity,

f) providing access for physically challenged people and
g) providing more enjoyable experiences for tourists through more meaningful connections with local people and developing a greater understanding of local cultural, socio-environmental issues and builds local pride and confidence.

Goodwin (2013) observed that responsible tourism addresses the issues, which matter locally centering the sustainability agenda and has deep-rooted implications in strategising the socio-economic and environmental threats and opportunities, which arise as consequences of tourism activities.

Further, Goodwin and Francis (2003) explained how responsible tourism may bring high quality engagement with local communities and their environments and emphasized on the Global Code of Ethics in Tourism (1997) formulated by the World Tourism Organisation (2010).

Miller (2001) opined for extra-government networks to foster, sensitize and activate responsible tourism practices. The non-governmental organisations (NGOs), responsible tourism associations (RTAs) and green activists may be a part of this symbiotic and synergistic network. However, tourism, as an asymmetrical and networked industry had conflicting outlook towards endorsing responsible tourism as the profit-lines often exhibited a diminishing trend.

Merwe and Wöcke (2007) observed that small ventures (namely small hotels, restaurants, logistic service providers etc.) might not perceive responsible tourism to deliver business advantages across the pool of stakeholders.

However, on the other hand, Bohdanowicz (2006) implied that the Scandinavian hoteliers were willing to make changes in response to emerging customer demand for "green" operations, combined with the growing evidence of financial benefits that are derived from managing resource-efficient facilities and posited that the geo-political, economic and socio-cultural contexts can have a significant influence on the environmental attitudes of hotel operators (Bohdanowicz, 2006).

Strategically speaking, responsible tourism must create 'shared-value' for the stakeholders (both visitors and host community) across the value-chains. Aligning the concept of responsible tourism with the Sustainable Development Goals (SDGs) of the United Nation (UN, 2015), a number of academic inputs highlighted that successful tourism ventures are lending support to the host community by building resilience, providing healthy lives and well-being, education, hunger and food security (Lloyd, 2015).

Such corporate behaviours are convergent with Porter and Kramer's (2011) "shared value" framework. Despite the theoretical inputs and construction of measurement indices with reference to performance in line with the principle of sustainable tourism, there is lack of empirical evidence about identification of the controllable metrics of responsible tourism.

Hanafiah et al (2016) assessed the impact of responsible tourism impacts on quality of life (QoL) and posited 'responsible destination planning' and 'responsible environmental practice' as dual-dimensional model to influence QoL. Stanford (2010) focused on visitor management system as a dimensional component of responsible tourism.

Stanford (2010) also identified a set of actions in conjunction to the spirit of responsible tourism and associated a set of influencers (Table-1) with the same.

Table-1: Action sets and influencers for Responsible Tourism.

Sl No.	Action	Influencers
1	Recycling	Infrastructure and Facilities
2	Crime prevention	Precaution
3	Water conservation	Awareness, habit and facilities
4	Experiencing local culture	Knowledge and understanding of significance
5	Spending money / Share-of-wallet	Unique nature of experience and scope

Source: Stanford (2010).

Tichaawa and Samhere (2015) identified that lack of comprehension of responsible tourism principles by the tourism stakeholders has been a major inhibitor in realizing its impact on key socio-environmental parameters focusing on sustainable tourism. The fundamental 'responsible' dimensions in the context of tourism, namely responsible economic, social and environmental behaviours encompass broad issues connected with policy formulation and governance.

Bakas and Duxbury (2018) proposed creative tourism framework (CREATOUR) as a possible manifestation of responsibility towards destination assets and observed a number of ethno-cultural interventions emerging from artisan-mediators, small-scale local festivals, accommodation, series of related events & workshops and stand-alone activities.

Therefore, one can observe the domains from which the actions are evolving namely environmental (recycling, water conservation), social (crime prevention), ethno-cultural (experiencing local culture) and economic (spending money/ share-of-wallet). However, identification of controllable determinants is critical to generate a desired level of outcome in ensuring economic gain, environmental protection and socio-cultural vibrancy.

Extant literature did not reveal any empirical attempt in identification of the controllable constructs of responsible tourism, which are assumed to play critical role in maneuvering and impacting socio-environmental performance of a destination identified by the United Nation Environmental Programme (UNEP), WorldTravel & Tourism Council (WTTC) and United Nation World Travel Organisation (UNWTO) and can be classified into economic, environmental, social & ethno-cultural heads.

Generating awareness and inducing responsible habits are apprehended to be the controllable issues while infrastructure and facilities may be semi-controllable depending on the policies and governance of local administration.

Business ventures cannot control all the determinants that influence a business outcome. But it cannot ignore the controllable dimenisons either as they essentially become part of their operational strategies and product/service design in addition to inoculate the destination from negative impacts of tourism operations.

Thus, the objectives of the study were two-fold:

(i) Identification of controllable metrics of responsible tourism
(ii) Assessing the relationship between the controllable metrics of responsible tourism and the socio-environmental performance indicators.

3 METHODOLOGY

Considering the nature of the study, which involved analyses of shared experience, a hermeneutic phenomenological methodology was adopted (Campelo et al., 2014; Pernecky and Jamal 2010). The approach was posited on Heidegger's philosophy to assess experiential judgements of human beings associated with active transactions.

The tourism industry provides a perfect opportunity to design research on hermeneutics based on phenomenology. Phenomenology, being predominantly used in qualitative studies, was used in this study to mine out the value judgments of the respondents involved in experiential transactions as visitors to destination/ s having tourism significance.

A hermeneutic circle was created a by assessing the socio-environmental and ethno-cultural background of the research setting, by co-constituting the research process and data collection with participants and by establishing iterative criteria to validate our findings with them (Laverty 2003).

The research method was multisite-ethnography (Ekstrom 2006; Davies 2008). Birbhum and Bankura, two districts in the state of West Bengal, India, were chosen as sites for study considering their attractions to the visitors based on traditional and transgenerational practice of art and crafts, ethnicity, indigenous rituals and festivals having deep-rooted socio-environmental implications, pilgrimscape and archeological heritage.

The socio-environmental performance indicators with respect to responsible tourism were abstracted from the frameworks developed by United Nations Environment Programme (UNEP), UN World Tourism Organisation (UNWTO) and World Travel & Tourism Council (WTTC).

Secondary data pertaining to the two districts under study were obtained across 25 key socio-environmental performance indicators (Table-2) from the annual reports of the referred districts.

Table-2: Socio-environmental performance indicators.

Sl. No.	Codes	Socio-environmental performance indicators
1	SEKPI_1	Number of endangered species
2	SEKPI_2	Perceived value of forest resources to
3	SEKPI_3	Proportion of time spent on nature
4	SEKPI_4	Number of hotels with environmental
5	SEKPI_5	Number of local-community services
6	SEKPI_6	Number of homestays in the
7	SEKPI_7	Environmental awareness campaign
8	SEKPI_8	Number of hotels and restaurants
9	SEKPI_9	Safety and security measures adopted
10	SEKPI_10	Percentage of bio-toilets provided by
11	SEKPI_11	Community participation in tourism
12	SEKPI_12	Women/ men as a percentage of all
13	SEKPI_13	Percentage of energy consumption
14	SEKPI_14	Satisfaction of volume of tourists
15	SEKPI_15	Existence of typical local products
16	SEKPI_16	Demand/supply ratio of water
17	SEKPI_17	Number of restaurants with
18	SEKPI_18	Initiatives of heritage conservation
19	SEKPI_19	Number of cultural events (festivals),
20	SEKPI_20	Number of guides per tourists
21	SEKPI_21	Crime Prevention scheme
22	SEKPI_22	Availability of interpretive programmes, facilities and materials (e.g. guided walks, visitor centres, museums, information in printed and electronic media) number of tourists using them
23	SEKPI_23	Amount of revenue retained for site
24	SEKPI_24	Amount of revenue generated at heritage sites and attractions (user fees, licences, retail and merchandising, etc.)
25	SEKPI_25	Number of historic/traditional buildings used for tourism services (accommodation, restaurants, shops)

Source: UNWTO (2015), WTTC (2015), UNEP (2014).

The data ranged from 1st April, 2016 to 31st March, 2018. Necessary clubbing of indicators were done to amplify its scope of coverage a broad perspective of social, cultural, ethnic and environmental performance as an output to responsible tourism practices in these two districts.

Exhaustive body of research focusing on the measurement of controllable metrics for responsible tourism is scarce if not absent. Few researchers (Hanafiah et al., 2016; Xin and Chan, 2014; Hafiz, 2014; Darson et al., 2013; Goodwin, 2012 and Spenceley, 2010) have attempted to develop the dimensions for responsible tourism, but, the controllable metrics were not identified.

Therefore, a surrogation technique was used to generate scale-items. The technique falls back on archival response-data related to sustainability agendas. A meta-analysis of the archives allowed the researcher to identify the scale items as dummy-fit to projected variables for responsible tourism.

The surrogate-based approach, which involves approximating the objectives as continuous functions of design variables from limited data, offered a rational framework to reduce the number of important input variables, i.e., the dimension of a design or modeling space (Shyy et al., 2011).

Following a phenomenological approach the questions were developed for the controllable metrics for responsible tourism programme. A 33-item scale targeted to generate response over a 7-point interval scale was also developed.

The population of the study, to obtain primary data, covered the tourism service providers and the facilitating agencies of the districts chosen for the study. The sample frame was carefully developed so that it incorporates the length and breadth of the tourism service providers and the facilitating agencies.

Convenience sampling was used considering the asymmetrical nature of the industry, which is an agglomeration of standalone services/ industries. 259 service providers and facilitating agencies were surveyed with a structured instrument which was piloted over a sample of 75 for its internal consistency (scale reliability) and validity (discriminant and convergent) with Confirmatory factor analysis (CFA).

5 cases were developed in line with the themes of ‘perception of responsible tourism’, ‘behaviour of tourists’, ‘role of community in propagating responsible tourism’ and ‘perception of local community about the support of Govt. and local administration’. The data collection spanned over a period of three years (2016-2018).

High-end softwares were used for analysing the data. Predictive analytics were done with IBM SPSS Modeler 18.0, text mining was done by Rapidminer and case analysis was done with Atlas.ti.

4 DATA ANALYSIS AND FINDINGS

Table-3: CFA results.

Construct dimensions	Scale-Items	Standardized Regression (loading)	Critical Ration (t values)	Composite Reliability (CR)	Average Variance Extracted (AVE)	α
Controllable destination management metrics (RTCM_1)	awareness of ecological fragility and vulnerability of the destination	0.757	10.165	0.851	0.489	0.887
	awareness about the history of the destination	0.745	10.543			
	awareness about mode of intervention with heritage sites of the destinations	0.714	12.398			
	segregation of buffer zones	0.671	13.776			
	assessing tourist load and assigning carrying capacity	0.655	14.091			
	responsible governance	0.652	14.982			
Controllable ecological and biodiversity management metrics (RTCM_2)	awareness about waste generation and its impact	0.769	10.796	0.801	0.503	
	awareness about local biodiversity and intervention techniques	0.74	10.421			
	awareness about vehicular intervention in identified buffer zones	0.696	14.235			
	awareness about availability of ecofriendly infrastructure & resources and mode of use	0.624	14.896			
	usage of renewable energy and water harvesting	0.619	14.991			
Controllable social & ethno-cultural management	awareness about the local culture and ethnicity, its historical significance and present-day implications	0.818	9.052	0.819	0.498	
	awareness about responsible intervention with local culture and ethnicity	0.795	11.425			

metrics (RTCM_3)	awareness about responsible intervention with local heritage and archeology	0.766	10.998			
	awareness of traditional festivals and its implications	0.791	10.278			
	awareness of crime redressal system	0.772	10.824			
Controllable community management metrics (RTCM_4)	awareness of tourism impact of the local community	0.697	13.292	0.826	0.506	
	community participation in responsible tourism practice	0.644	13.782			
	community networks and reciprocity in propagating responsible tourism	0.684	12.983			
	community-led initiatives in promoting responsible tourism	0.677	11.932			
	social innovation models to propagate responsible tourism	0.651	13.425			
Controllable visitor management metrics (RTCM_5)	information about the destination in terms of resources	0.871	10.009	0.817	0.578	
	information about the likelihood-experience	0.842	11.624			
	information about the intervention ethics and responsibilities	0.756	13.092			
	information about host community and intervention techniques	0.721	13.721			
	information about host community and intervention techniques	0.699	14.291			

Extraction Method: Principal Component Analysis. 5 components extracted.
Source: proper elaboration.

Table-4: KMO and Barlett's Sphericity Test

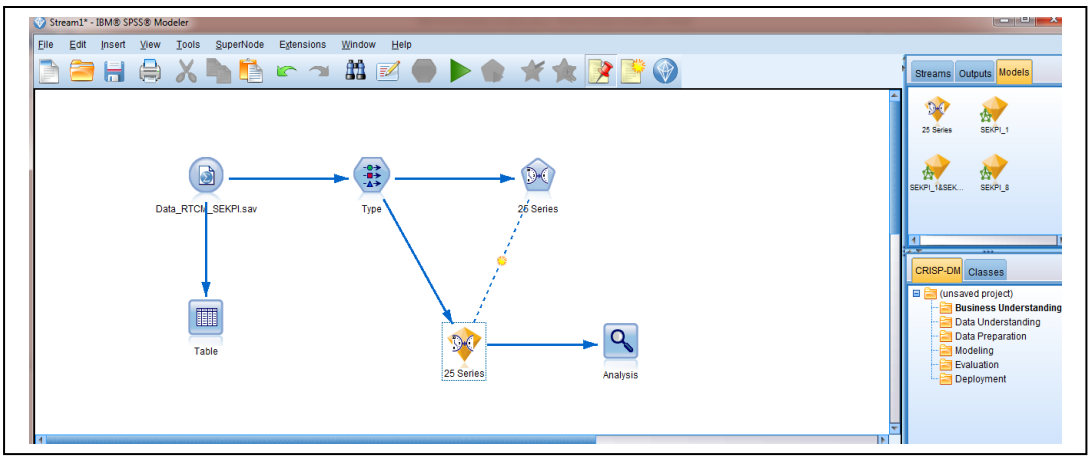
KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.899
Bartlett's Test of Sphericity	Approx. Chi-Square	2106.501
	df	66
	Sig.	0.000

Source: proper elaboration.

Temporal causal modeling is used to uncover causal relationships between the controllable metrics and the key performance indicators. The procedure then builds an autoregressive time series model for each target and includes only those inputs that have a causal relationship with the target. This approach differs from traditional time series modeling where one must explicitly specify the predictors for a target series. Since temporal causal modeling typically involves building models for multiple related time series, the result is referred to as a *model system*. In the context of temporal causal modeling, the term *causal* refers to Granger causality. A time series X is said to "Granger cause" another time series Y if regressing for Y in terms of past values of both X and Y results in a better model for Y than regressing only on past values of Y.

We use the IBM SPSS Modeler function to generate the stream of functional nodes (Fig.1) to be used for temporal causal modeling.

Fig.1: Stream of nodes for Temporal Causal Modeling analysis.



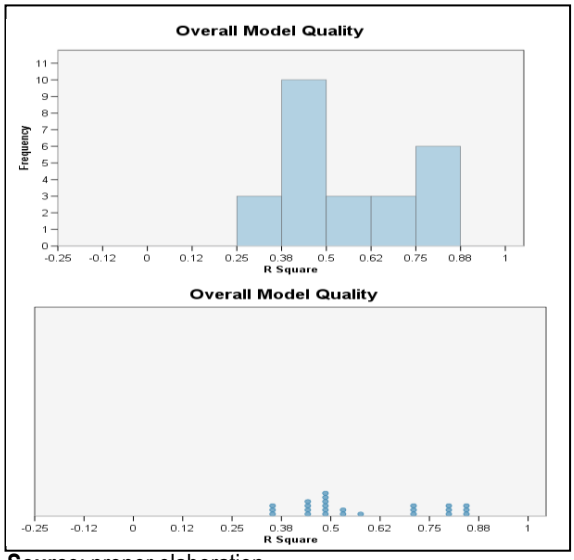
Source: proper elaboration.

The data is bifurcated into candidate inputs (from data generated for controllable metrics of responsible tourism) and target series (socio-environmental performance data). In the time series modeling, 'predefined roles' of data was selected. The data pertaining to socio-environmental performance indicators is tagged as both input and target. The temporal causal modeling procedure determines the best inputs for each target from the set of candidate inputs. Confidence interval width was fixed at 95% and the outlier threshold was also limited to 95%.

The overall Model Quality (Fig. 2) displayed a bar chart and an associated dot plot of the model fit for all models. There was a separate model for each target series. The model fit was measured by the chosen fit statistic - R Square.

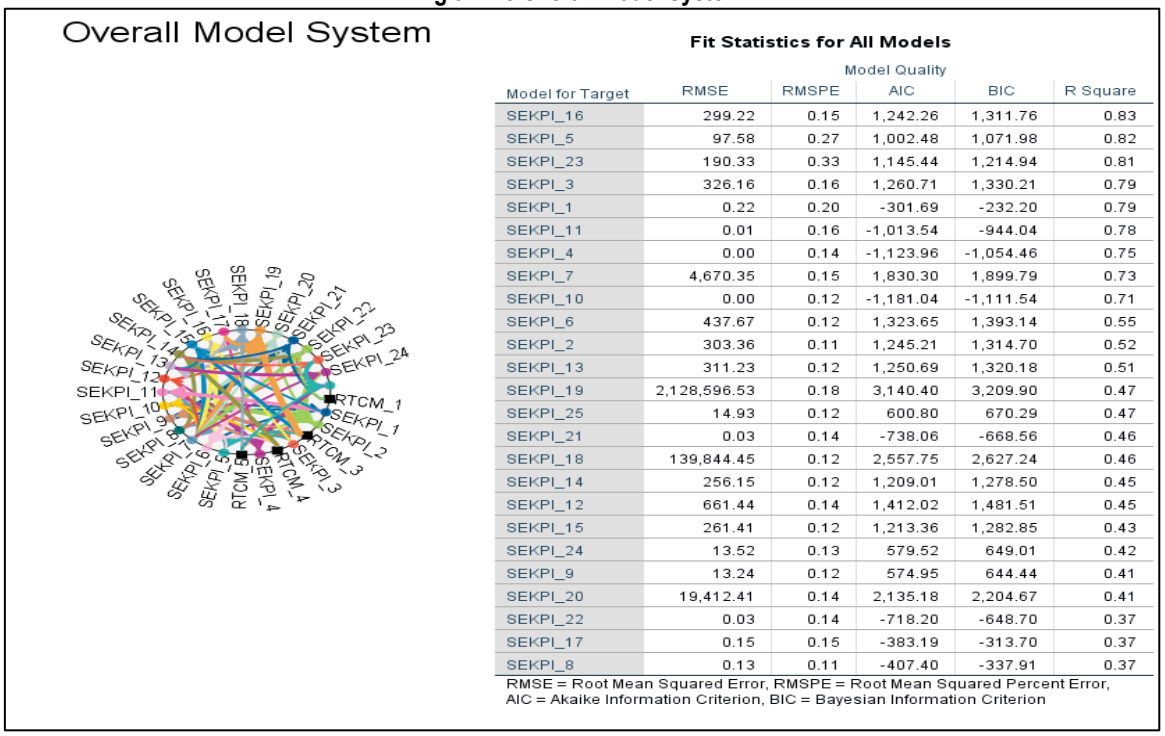
The R square value ranged from 0.25 to 0.88. The significant contributors to the model are RTCM_2 (R square = 0.50), RTCM_3 (R square = 0.62), RTCM_4 (R square = 0.75) and RTCM_5 (R square = 0.88).

Fig.2: The Overall Model Quality.



Source: proper elaboration**.**

Fig.3: The Overall Model System.



Fit Statistics for All Models

	Model Quality				
Model for Target	RMSE	RMSPE	AIC	BIC	R Square
SEKPI_16	299.22	0.15	1,242.26	1,311.76	0.83
SEKPI_5	97.58	0.27	1,002.48	1,071.98	0.82
SEKPI_23	190.33	0.33	1,145.44	1,214.94	0.81
SEKPI_3	326.16	0.16	1,260.71	1,330.21	0.79
SEKPI_1	0.22	0.20	-301.69	-232.20	0.79
SEKPI_11	0.01	0.16	-1,013.54	-944.04	0.78
SEKPI_4	0.00	0.14	-1,123.96	-1,054.46	0.75
SEKPI_7	4,670.35	0.15	1,830.30	1,899.79	0.73
SEKPI_10	0.00	0.12	-1,181.04	-1,111.54	0.71
SEKPI_6	437.67	0.12	1,323.65	1,393.14	0.55
SEKPI_2	303.36	0.11	1,245.21	1,314.70	0.52
SEKPI_13	311.23	0.12	1,250.69	1,320.18	0.51
SEKPI_19	2,128,596.53	0.18	3,140.40	3,209.90	0.47
SEKPI_25	14.93	0.12	600.80	670.29	0.47
SEKPI_21	0.03	0.14	-738.06	-668.56	0.46
SEKPI_18	139,844.45	0.12	2,557.75	2,627.24	0.46
SEKPI_14	256.15	0.12	1,209.01	1,278.50	0.45
SEKPI_12	661.44	0.14	1,412.02	1,481.51	0.45
SEKPI_15	261.41	0.12	1,213.36	1,282.85	0.43
SEKPI_24	13.52	0.13	579.52	649.01	0.42
SEKPI_9	13.24	0.12	574.95	644.44	0.41
SEKPI_20	19,412.41	0.14	2,135.18	2,204.67	0.41
SEKPI_22	0.03	0.14	-718.20	-648.70	0.37
SEKPI_17	0.15	0.15	-383.19	-313.70	0.37
SEKPI_8	0.13	0.11	-407.40	-337.91	0.37

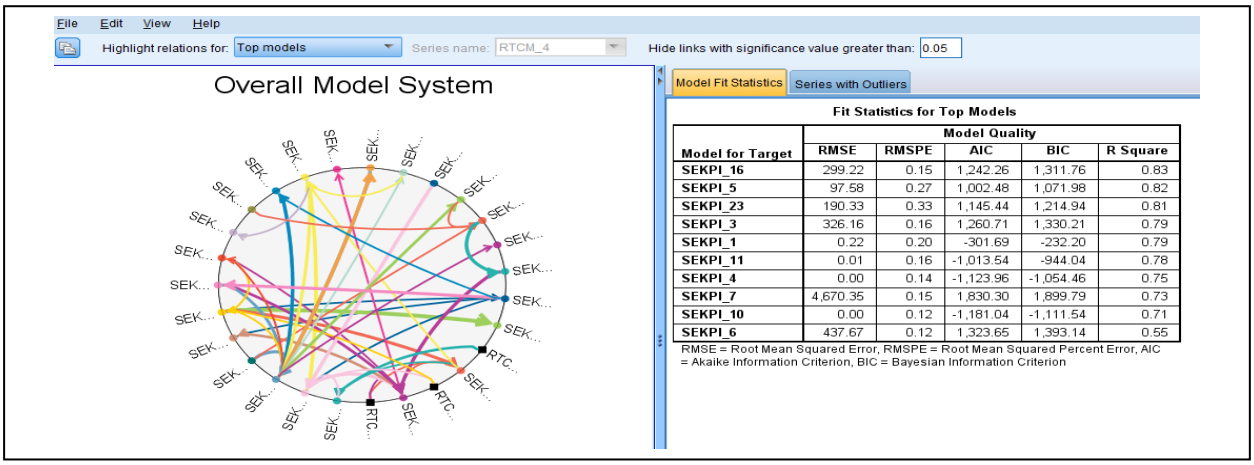
RMSE = Root Mean Squared Error, RMSPE = Root Mean Squared Percent Error, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion

Source: proper elaboration.

The top models can also be filtered out (Fig.4). By default, the process churns out 10 top models. The target variables under socio-environmental performance indicators that were found to be included in the top models are SEKPI_16 (demand/supply ratio of water, r^2 = 00.83), SEKPI_5 (number of local-community services on offer, r^2 = 00.82), SEKPI_23 (amount of revenue retained for site conservation, r^2 = 00.81), SEKPI_3 (proportion of time spent on nature tourism out of the span of stay, r^2 = 00.79), SEKPI_1 (number of endangered species identified, r^2 = 00.79), SEKPI_11 (community participation in tourism activity, r^2 = 00.78), SEKPI_7 (environmental awareness campaign conducted in the destination, r^2 = 00.75), SEKPI_4 (number of hotels with environmental policy in place, r^2 = 00.73), SEKPI_10 (percentage of bio-toilets provided by local administration, r^2 = 00.71), SEKPI_6 (number of homestays in the destination, r^2 = 00.55).

The major predictors are RTCM_3 (controllable social & ethno-cultural management metrics), RTCM_4 (controllable community management metrics) and RTCM_5 (controllable visitor management metrics). The RMSE value values were also found to be significant for the models. The process supports dynamic extraction of single model too.

Fig.4: Top models extracted.



Model for Target	Model Quality				
	RMSE	RMSPE	AIC	BIC	R Square
SEKPI_16	299.22	0.15	1,242.26	1,311.76	0.83
SEKPI_5	97.58	0.27	1,002.48	1,071.98	0.82
SEKPI_23	190.33	0.33	1,145.44	1,214.94	0.81
SEKPI_3	326.16	0.16	1,260.71	1,330.21	0.79
SEKPI_1	0.22	0.20	-301.69	-232.20	0.79
SEKPI_11	0.01	0.16	-1,013.54	-944.04	0.78
SEKPI_4	0.00	0.14	-1,123.96	-1,054.46	0.75
SEKPI_7	4,670.35	0.15	1,830.30	1,899.79	0.73
SEKPI_10	0.00	0.12	-1,181.04	-1,111.54	0.71
SEKPI_6	437.67	0.12	1,323.65	1,393.14	0.55

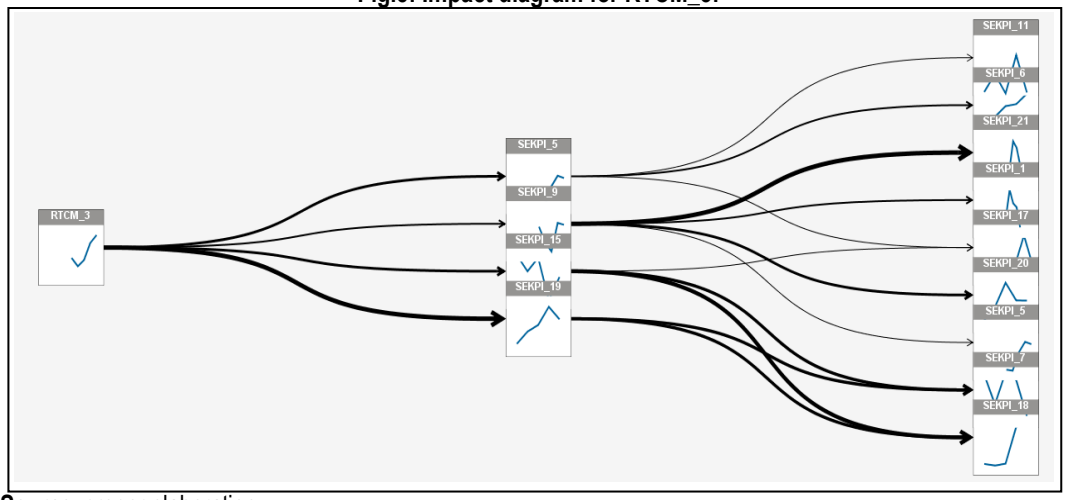
RMSE = Root Mean Squared Error, RMSPE = Root Mean Squared Percent Error, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion

Source: proper elaboration**.**

Impact diagrams were obtained from the Overall Model System, which initially showed the series that are affected by the selected series. By default, impact diagrams show three levels of effects, where the first level is just the series of interest. Each additional level showed more indirect effects of the series of interest.

The impact diagram (Fig.5) for RTCM_3 (controllable social & ethno-cultural management metrics) was found to be a direct input to SEKPI_5 (number of local-community services on offer), SEKPI_9 (safety and security measures adopted), SEKPI_15 (existence of typical local products (handicrafts, cuisine), number of shops, restaurants offering them) and SEKPI_19 (number of cultural events (festivals), and level of attendance) and also exhibited significant (the thickness of the lines indicates the significance of the causal relations) indirect impact on series SEKPI_1 (number of endangered species identified), SEKPI_7 (environmental awareness campaign conducted in the destination) and SEKPI_18 (initiatives of heritage conservation).

Fig.5: Impact diagram for RTCM_3.

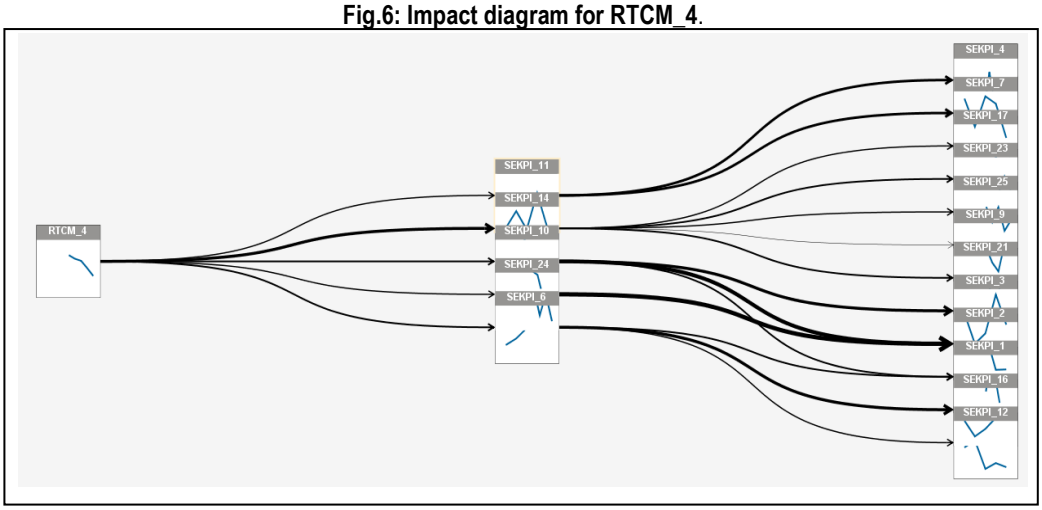


Source: proper elaboration**.**

The impact diagram (Fig.6) for RTCM_4 (controllable community management metrics) was found to be a direct input to SEKPI_11 (community participation in tourism activity), SEKPI_14 (satisfaction of volume of tourists visiting the destination), SEKPI_10 (percentage of bio-toilets provided by local administration), SEKPI_6 (number of homestays in the destination) and SEKPI_24 (amount

of revenue generated at heritage sites and attractions, namely, user fees, licences, retail and merchandising, etc.) and also exhibited significant indirect impact on series SEKPI_1 (number of endangered species identified), SEKPI_2 (perceived value of forest resources to tourism), SEKPI_7 (environmental awareness campaign conducted in the destination), SEKPI_12 (women/ men as a percentage of all tourism employment) and SEKPI_17 (number of restaurants with environmental policy in place).

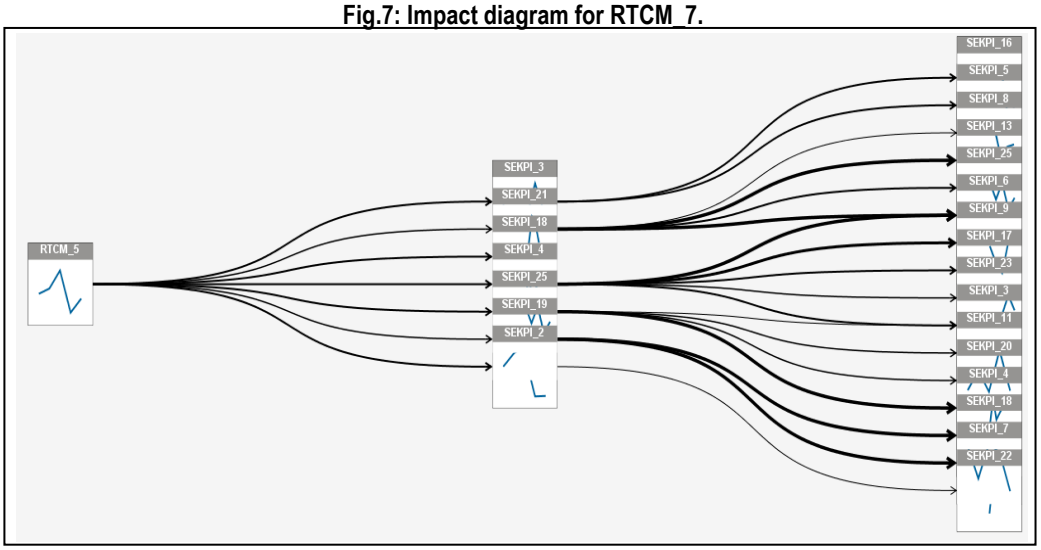
Fig.6: Impact diagram for RTCM_4.



Source: proper elaboration.

Impact diagram was also obtained (Fig.7) for RTCM_5 (controllable visitor management metrics) which showed direct impact on SEKPI_3 (proportion of time spent on nature tourism out of the span of stay), SEKPI_21 (crime Prevention scheme), SEKPI_18 (initiatives of heritage conservation), SEKPI_4 (number of hotels with environmental policy in place), SEKPI_25 (number of historic/traditional buildings used for tourism services, namely, accommodation, restaurants, shops), SEKPI_19 (number of cultural events (festivals), and level of attendance) and SEKPI_2 (perceived value of forest resources to tourism).It also displayed significant indirect impact on SEKPI_9 (safety and security measures adopted), SEKPI_7 (environmental awareness campaign conducted in the destination) and SEKPI_22 (availability of interpretive programmes, facilities and materials (e.g. guided walks, visitor centres, museums, information in printed and electronic media) number of tourists using them. The chart that is displayed in each node of the impact diagram shows the last L+1 values of the associated series at the end of the estimation period and any forecast values, where L is the number of lag terms that are included in each model.

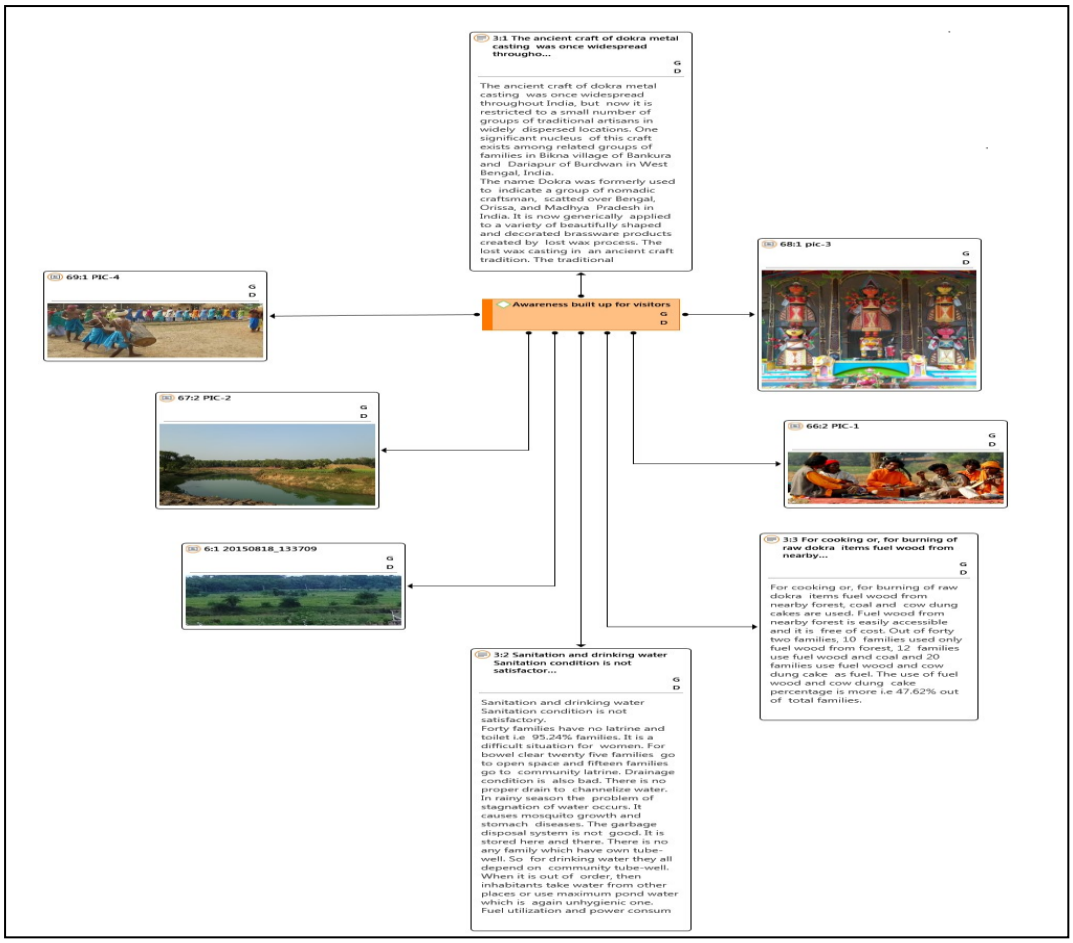
Fig.7: Impact diagram for RTCM_7.



Source: proper elaboration.

Analysis of the case study was done using Atlas.ti. A network analysis was done followed by generating a code co-occurrence table (with C coefficient) to identify the similar expressions shared in cases. Atlas.ti was used to code the case contents with appropriate word/idiom/phrase and were examined for network to understand the commonality of the respondents' perception about the destination. The network (Fig. 8) was established on similar opinions associated with the destination, issues of sustainability, community initiatives and manifested through opinions, photographs and videos.

Fig.8: Network.



Source: proper elaboration.

A code co-occurrence table was generated to understand the co-occurrence of the variables. Code co-occurrence is a kind of correlation exercise with C coefficient representing the strength of co-occurrence. Table-5 represents the code co-occurrence, which revealed that most of the opinions of the respondents focusing on the controllable metrics of responsible tourism significantly co-occurs with the perceived performance of socio-environmental factors.

Table-5: Code co-occurrence table.

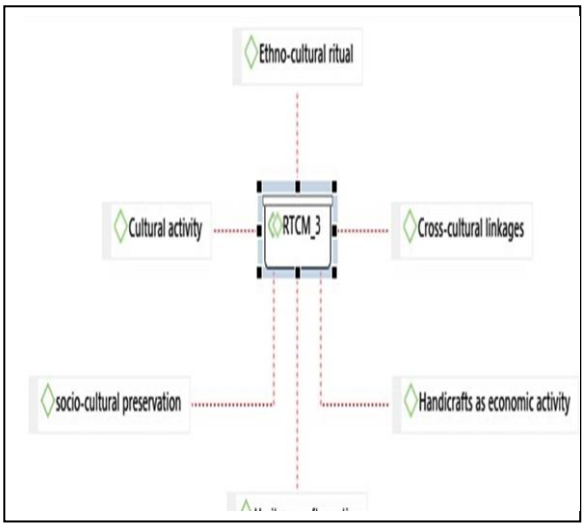
	Alternativ... 3	Alternative... 1	Environ... 8	Handicr... 4	Herita... 4	Natural ve... 1	Resourc... 1	Responsi... 6	Route m... 1	Rural Eco T... 1	Rural tourism 3	socio-cult... 4	Socio-envi... 1
Awareness bui... 12		1 (0.08)	4 (0.25)		1 (0.07)	1 (0.08)	1 (0.08)	3 (0.20)	1 (0.08)			1 (0.07)	
Being a part of... 3									1 (0.33)				
Community p... 4	2 (0.40)		1 (0.09)	1 (0.14)				1 (0.11)			1 (0.17)	1 (0.14)	
Connection wi... 2													
Cross-cultural... 6	1 (0.13)		1 (0.08)					2 (0.20)					
Cultural activity 2												1 (0.20)	
Ethno-cultural... 1												1 (0.25)	
Experiential to... 10									1 (0.10)				
Heritage craft... 4				2 (0.33)				2 (0.25)				2 (0.33)	1 (0.25)
Natural vegeta... 1			1 (0.13)										
Responsible T... 6	1 (0.13)	1 (0.17)	3 (0.27)	2 (0.25)	2 (0.25)		1 (0.17)					2 (0.25)	1 (0.17)
Responsible to... 2				1 (0.20)	1 (0.20)			2 (0.33)				1 (0.20)	
Tourists enjoyi... 3													
Traditional reli... 2													

Ethno-cultural ritual(1) @ Natural vegetation(1)

Source: proper elaboration.

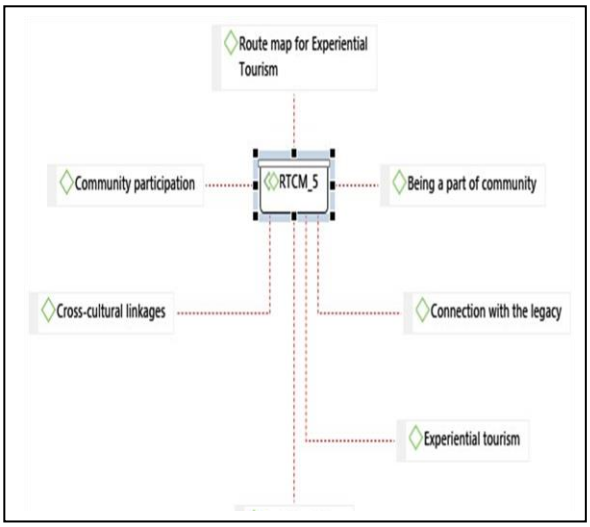
Further networks also revealed that RTCM_3 (controllable social & ethno-cultural management metrics), RTCM_4 (controllable community management metrics) and RTCM_5 (controllable visitor management metrics) had significant relationship with the respondents' opinion about perceived performance of socio-environmental factors (Fig.9, Fig. 10 & Fig.11).

Figure 9: title.



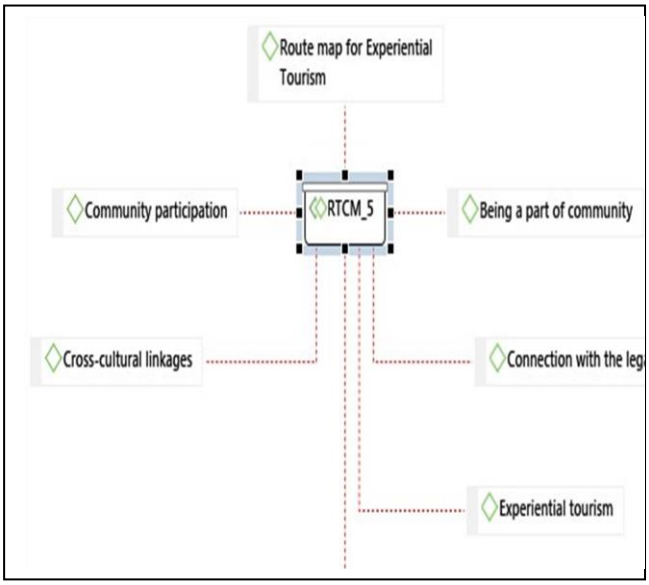
Source: proper elaboration.

Figure 10: title.



Source: proper elaboration.

Figure 11: title.



Source: proper elaboration.

5 DISCUSSION AND CONCLUSIONS

This paper focused on identification of the controllable metrics of responsible tourism and further attempted to identify the relationship, if any, with the socio-environmental performance indicators. The study was posited on the theoretical underpinning that for a sector as asymmetrical and abstract as tourism and with the probability of collateral damages intertwined with perceived economic gains, it is desirous for business organizations to know what they can control.

To impose responsibility on the stakeholders the impact of these controllable metrics on the performance indicators is critical. The study developed a measurement construct for the controllable metrics and was tested for reliability, validity and dimensionality.

The study was located in the districts of Birbhum and Bankura of West Bengal, India. Locations were chosen based on their tourism significance, tourist traffic (both domestic and overseas), ethno-cultural legacy, fragile rural ecosystem and heritage.

Five major controllable metrics were identified, namely, controllable destination management metrics, controllable ecological and biodiversity management metrics, controllable social and ethno-cultural metrics, controllable community management metrics and controllable visitor management metrics.

The results revealed significant relationship between most of the socio-environmental key performance indicators and social and ethno-cultural metrics, community management metrics and visitor management metrics.

The fact that destination management metrics and ecological and biodiversity management metrics could not be linked with the socio-environmental performance indicators implicated poor destination-infrastructural facilities and lack of awareness amongst the stakeholders. It also hinted towards the lack of adequate number sensitization programmes and initiatives on behalf of the local administration and service providers.

Temporal causal modeling (TCM) was used for the analysis purpose to identify the granger causality of variations in the target variables (socio-environmental performance indicators) which can be attributed to the category input variables (controllable metrics of responsible tourism).

The findings reinforced the theory of "shared network" of Porter and Kramer (2011) as it was established that businesses might assume better position to understand and assess productivity as they collaborate with stakeholders across profit and non-profit boundaries. The controllable metrics are critical for strategising responsible tourism and create a "shared network" of the service providers and the stakeholders.

The study also resonated the observation of Merwe and Wöcke (2007) about small hotels and allied tourism ventures not emphasizing on the sustainable issues due to cost constraints and a fear to lose profit margin. Both Birbhum and Bankura, having rural backdrops, ethno-cultural spread, indigenous demography (tribes), vulnerable ecosystem and rich archeological heritage, offers a perfect case of business dilemma to struck balance between economy and ecology.

Initiatives of homestay, organic farming, water conservation, recycling of wastes, periodical assessment of carrying capacity and use of alternative source of energy must be initiated, monitored and controlled. However, the established relationships between the controllable metrics and the performance indicators supports the earlier study made by Bohdanowicz (2006), which confirmed the changing attitudes of the hoteliers to address the demand of green operations by the visitors.

The study has serious implications for the host community. For long, the host community has remained inert towards the tourism initiatives of the locality except for the service providers and the direct stakeholders. This inertness has diluted the essence of responsibility. Host community has observed that 'responsibility' is a collective effort of the administration and the visitors, but they have failed to understand that they are the bridge between them. Therefore, 'community management' has been identified as one of the controllable metrics to have profound impact on the socio-environmental performance indicators. The study is particularly significant for the Destination Marketing Organizations from policy point of view.

Future extrapolations of the study can be done by incorporating the economic variables. The study can be conducted in the metro destinations to have an understanding about the difference in controllable metrics and their probable impact on the socio-environmental variables.

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