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## ORIGINAL ARTICLE

### Structural Equation Modeling of Green Supply Chain Management for Iranian Sports facilities Services

Siamak Saleh Farajzadeh<sup>1</sup>, Mohammad Rasoul Khodadadi<sup>2\*</sup>, Yaghoob Badriazarin<sup>3</sup>

1. Ph.D Student, Department of Sports Management, Faculty of Physical Education and Sport Sciences, University of Tabriz, Tabriz, Iran.

2. Associate Professor, Department of Sports Management, Faculty of Physical Education and Sport Sciences, University of Tabriz, Tabriz, Iran.

3. Professor, Department of Sports Management, Faculty of Physical Education and Sport Sciences, University of Tabriz, Tabriz, Iran.

#### \*Correspondence

Mohammad Rasoul Khodadadi  
E-mail: [rm\\_kh85@yahoo.com](mailto:rm_kh85@yahoo.com)

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## EXTENDED A B S T R A C T

### Introduction

Supply chain management is one of the dimensions of extended producer responsibility (EPR) (1) and can be defined as the coordination of the supply chain in a way that considers environmental concerns and coordinates inter-organizational activities (2). Supply chain management is responsible for the collection, production and distribution of materials to manage the needs of stakeholders to improve the profitability, competitiveness and resilience of the organization in the short and long term through improving green performance (3). In a conventional classification, green supply chain management practices are categorized into internal green practices, external green participation, green performance, green entrepreneurship and green innovation. Internal green practices can be defined as what a company does on a daily basis in its internal activities. These actions reflect the decisions of companies to implement environmentally friendly measures (4). While external green participation is defined as the challenge and direct interaction with upstream suppliers, company partners and downstream customers in the supply chain in relation to joining environmental programs for environmental management and solutions (5).

Considering the importance of the above-mentioned topics in the field of green supply chain management of services, sports venues that are service-based in nature are no exception. Green supply chain management can be effective as an effective indicator in the quality of services provided and creating value for the customer in sports venues (6). Unfortunately, in sports venues today, the decline in service quality, the presence of coaches with low levels of education and coaching, managers without experience in management, and an inappropriate space and environment have caused more customer dissatisfaction (7). It is essential that venue managers, organizations, and sports boards are aware of the factors affecting the implementation of green supply chain management of services in sports venues so that they can address existing deficiencies and, by emphasizing more on the impact of green supply chain management in improving quality, customer satisfaction, various purchasing motives such as comfort, dignity, shape, features, services, environmental issues, etc., play an effective role in the development of their sports and sports venues at different times and places. The emphasis of supply chain management is on shifting the mindset from transaction to value creation, and this value creation should take place in the entire chain and not just in one part

of it. The necessity of conducting this research was to clarify the importance and necessity of appropriate green supply chain management of sports services in sports venues; Therefore, the present study was conducted with the aim of modeling the structural equations of green service supply chain management in sports facilities in Iran.

### Methodology

The present study is interpretive in terms of paradigm, applied in terms of purpose, quantitative in terms of data type, and field-library in terms of data collection method. The statistical population of this study was professors, specialists, experts, and activists who had research or executive experience in the field of supply chain management and sports venue management. Given the vastness and uncertainty of the statistical population in the country and also considering the Krejci and Morgan table, the maximum possible number, which is 384 people, was used. Two methods were used to collect data in this study. A library method was used to collect data related to theoretical foundations and research background and a researcher-made questionnaire with a five-option Likert response method was used to collect data related to the main research variables. Since the present study is extracted from a doctoral dissertation, the questionnaire used in this study was obtained from the qualitative findings of the dissertation. To prepare this questionnaire, the interviews conducted in the qualitative phase of the aforementioned thesis were first analyzed using three stages of open, axial, and selective coding. When preparing the questionnaire, open codes were determined as questionnaire items, axial codes as components, and selective codes as dimensions of the questionnaire. This questionnaire consists of 5 dimensions, 14 components, and 70 items and the dimensions of this questionnaire include green services (services during sales and after-sales services), green resources (green equipment and facilities, green energy, and knowledge resources), green human resources (green employees and green customers), green marketing (information methods and communication channels), and sustainable green success (high profitability, increasing customers, adherence to environmental responsibility, gaining popularity, and gaining competitive advantage). To assess the validity of the questionnaire from the experts' point of view, convergent validity, divergent validity, and the AVE criterion were used, and the reliability of the questionnaire was also evaluated by examining the factor loadings of each item in the questionnaire, Cronbach's alpha test, and composite reliability. All criteria indicated appropriate validity and reliability of the research tool, and the Cronbach's alpha value of the questionnaire was 0.86. Data analysis was performed in this study in two ways. In the first part, descriptive statistics were used to examine and describe demographic information, and in the second part, structural equation modeling was used in smartPLS3.1.1 software at a significance level of 0.05.

### Findings

The descriptive results of the study showed that about 23% of the participants were female and 77% were male, the highest frequency percentage for the age variable was related to the age group of 31 to 40 years (32%), most of the individuals (about 51%) had a master's degree, and most of their service experience was 11 to 15 years. In this study, structural equation modeling (SEM) was used to analyze the data. For this purpose, first, the fit indices of the first-order reflective and second-order constructivist measurement models were used to examine the fit of the research model. To examine the fit of the first-order reflective measurement models, composite reliability indices, Cronbach's alpha, factor loadings, convergent validity (AVE), and the Fornell-Larker index (divergent validity) were used and to examine the second-order constructivist fit, the variance increment index (VIF) was used. An examination of the factor loading coefficients of each of the questionnaire questions showed that the factor loadings of all questions were greater than 0.4. All variables obtained Cronbach's alpha and composite reliability values higher than 0.7, AVE index higher than 0.5 and VIF index lower than 5, therefore the instrument used in this study has appropriate reliability, convergent

validity and variance increase rate. The AVE root value of all first-order variables is greater than the correlation value between them, which indicates the divergent validity of the research instrument and the appropriate fit of the research model. At a confidence level of 95%, considering that the t-statistic value of all paths is greater than 1.96 and their significance is less than 0.05, it can be stated that the research model is appropriate and all paths are confirmed. Also, according to the results of this table, it can be stated that green services ( $p=0.011$ ;  $t=2.542$ ), green resources ( $p=0.001$ ;  $t=5.449$ ), green human resources ( $p=0.018$ ;  $t=2.165$ ), and green marketing ( $p=0.001$ ;  $t=6.765$ ) have a positive and significant impact on the sustainable green success of sports venue services.

### Discussion and Conclusion

The results of the study showed that green services, including pre-sales and after-sales services, have a positive and significant effect on the sustainable green success of sports venue services. This part of the study results is consistent with some of the research results of Memari et al. (2025), Ricardianto et al. (2022), Hazen et al. (2021), and Yektayar (2019). The results of the study also showed that green resources, including green equipment and facilities, green energy, and knowledge resources, have a positive and significant effect on the sustainable green success of sports venue services. This part of the study results is consistent with some of the research results of Li and Zhai (2025), Xu and Wang (2023), and Sadeghi Arani et al. (2022). Other results of the study showed that green human resources, including green employees and green customers, have a positive and significant effect on the sustainable green success of sports venue services. This part of the research results is in line with some of the research results of Kong et al. (2024), Sadeghi et al. (2023) and Gavoussou et al. (2022). The research results also showed that green marketing, including information methods and communication channels, have a positive and significant effect on the sustainable green success of sports venue services. This part of the research results is in line with some of the research results of Fazaeli et al. (2024), Tayyebbeh and Rein (2022) and Yousefi et al. (2021).

Based on the results of this study, it can be stated that if the services during and after the sale of sports venues are green, green equipment and facilities, green energy, and green knowledge resources are used in sports venues, green management methods are used in the human resource management process, including employees and customers of sports facility services, and the information methods and communication channels used in sports venue services pass the green filter, profitability in sports venues will increase, customers will increase, and adherence to environmental responsibility will also increase in sports venues, which will firstly lead to popularity and secondly lead to a competitive advantage for Iranian sports venues. Finally, according to the research results, it can be stated that sports venue managers can ensure sustainable green success of sports venue services by utilizing green services, resources, and human resources, as well as adopting green marketing practices.

### KEY WORDS

Green Services, Sports Facilities, Supply Chain Management.

