



# **KONFERENCIAKÖTET**

## Conference Proceedings

**Nemzetközi tudományos konferencia  
a Magyar Tudomány Ünnepe alkalmából**  
International Scientific Conference  
on the Occasion of the Hungarian Science Festival

**Sopron, 2022. november 3.**  
3 November 2022, Sopron

**TÁRSADALOM – GAZDASÁG – TERMÉSZET:  
SZINERGIÁK A FENNTARTHATÓ FEJLŐDÉSBN**

SOCIETY – ECONOMY – NATURE: SYNERGIES IN SUSTAINABLE DEVELOPMENT

Szerkesztők / Editors:

OBÁDOVICS Csilla, RESPERGER Richárd, SZÉLES Zsuzsanna, TÓTH Balázs István

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## TARTALOMJEGYZÉK / CONTENTS

### **1. szekció (személyes): Fenntartható gazdálkodás és menedzsment, körforgásos gazdaság** Session 1 (personal): Sustainable Economy and Management, Circular Economy

#### **Az ökológiai termelés és termékek piacának változásai a COVID-19 okozta megszorítások alatt**

*Dr. GYARMATI Gábor* ..... 11

#### **Fenntartható fejlődés és körforgásos gazdaság a vállalkozások mindennapi életében**

*Dr. FEKETE-BERZSENYI Hajnalka – Dr. KOZMA Dorottya Edina –*

*Dr. MOLNÁRNÉ dr. BARNA Katalin – Prof. Dr. MOLNÁR Tamás* ..... 26

#### **Fenntarthatóság a divatiparban (?) – Négy divatipari szervezet CSR jelentésének rövid áttekintése, valamint a fenntarthatóságra törekvés fogyasztók általi észlelésének vizsgálata**

*VIZI Noémi* ..... 39

#### **Épített örökségeink fenntarthatósága a volt szovjet laktanyák újrahasznosításának példáján keresztül**

*TEVELY Titanilla Virág* ..... 52

### **2a. szekció (személyes): A fenntartható fejlődés globális és regionális vetületei**

Session 2a (personal): Global and Regional Aspects of Sustainable Development

#### **A migráció mérésének módszertani nehézségei**

*RUFF Tamás* ..... 65

### **2b. szekció (személyes): A fenntartható fejlődés globális és regionális vetületei**

Session 2b (personal): Global and Regional Aspects of Sustainable Development

#### **Munkaérték preferenciák vizsgálata a szállítási ágazatban**

*Dr. BALÁZS László – Dr. KŐKUTI Tamás* ..... 73

### **3. szekció (személyes): Turizmus és marketing, fenntartható turizmus**

Session 3 (personal): Tourism and Marketing, Sustainable Tourism

#### **Studentifikáció Lágymányoson, avagy az újbudai egyetemek hatása a fenntartható turizmusra**

*KISS Bence Álmos – PORHAJAS Gábor László* ..... 85

#### **Book Consumption Literature – Literature Review on the Subject of the Behavior of Book Consumers**

*Miklós LÉGRÁDI – Dr. habil. Zoltán SZABÓ* ..... 96

#### **Szállodaüzemi intézkedések irányvonalai a fenntarthatóság jegyében**

*MARTOS János András* ..... 114

**Sportfogyasztási szempontú elemzés a Sopronban rendezett  
2021-es Női Vízilabda Magyar Kupáról**  
*CSISZÁR Szabolcs János – Dr. habil. PAÁR Dávid* .....126

**4a. szekció (személyes): Pénzügyek, számvitel, fenntartható pénzügyek**  
Session 4a (personal): Finance, Accounting, Sustainable Finance

**A könyvviteli szolgáltatási szakma megítélése. Összehasonlító elemzés  
a 2020. és 2022. évek felmérése alapján**  
*Dr. VERESS Attila – Dr. SIKLÓSI Ágnes – Dr. SISA Krisztina A.* .....136

**A KKV-szektor hitelezési tendenciának értékelése MNB adatok alapján**  
*MÁRKUS Mónika* .....147

**Az ellátási láncok fenntartható pénzügyi adaptációja  
– rövidtávú fizetési kötelezettségek finanszírozása**  
*Dr. CZIRÁKI Gábor – HACKL János* .....158

**ESG közzététel vizsgálata nemzetközi háttérű kereskedelmi bankok esetében  
Magyarországon**  
*SIKLÓSI Veronika* .....172

**4b. szekció (személyes): Pénzügyek, számvitel, fenntartható pénzügyek**  
Session 4b (personal): Finance, Accounting, Sustainable Finance

**A fenntarthatóság és az osztalékpolitika kapcsolata**  
*Dr. KUCSÉBER László Zoltán – Dr. CSOMA Róbert* .....180

**Pénzügyi és öngondoskodási ismeretek a magyar középiskolák  
végzős osztályaiban 2021-ben**  
*KOVÁCS Zoltán – TÖRÖNÉ Prof. Dr. DUNAY Anna* ..... 188

**A cégértékelés módszertani kihívásai**  
*FÁBIÁNNÉ JÁTÉKOS Judit Ilona* .....203

**5. szekció (személyes): Sustainable Economy, Management and Development**  
Session 5 (personal): Sustainable Economy, Management and Development  
(session in English)

**The Qualitative Characteristics of Accounting Information: A Literature Review**  
*Asma MECHTA – Prof. Dr. Zsuzsanna SZÉLES – Dr. Ágnes SIKLÓSI* .....219

**Tourism Development in Indonesia - Surakarta City Role Supporting  
National Tourism Planning**  
*Dr. Rizky Arif NUGROHO – Laura BAZSÓNÉ BERTALAN PhD –  
Judit PAPPNÉ VANCSÓ PhD* .....228

**Green Manufacturing Practices Towards Sustainable Development  
in the Ready-Made Garments (RMG) Industry of Bangladesh**  
*Dr. Md. Sadrul Islam SARKER – K. M. Faridul HASAN – Dr. István BARTÓK* .....241

<b>Drivers and Barriers of GSCM Practices Implementation: Literature Review</b> <i>Khouloud CHALLOUF – Dr. Nikoletta NÉMETH</i> .....	252
--	-----

**6. szekció (személyes): Tourism and Marketing, Sustainable Tourism**  
Session 6 (personal): Tourism and Marketing, Sustainable Tourism  
(session in English)

<b>Impact of COVID-19 Pandemic on Tourism Sector in Vietnam</b> <i>Thi Thuy Sinh TRAN – Dr. Nikoletta NÉMETH – Dr. Thai Thuy PHAM – Nhat Anh NGUYEN</i> .....	259
--	-----

<b>Tourism in Troubled Times: the Economic and Social Effects of Short- and Expected Long-Term Changes</b> <i>Dr. habil. Tamás SZEMLÉR</i> .....	276
---	-----

<b>Application Areas of Drones: Exploratory Research from Residential and Corporate Perspectives</b> <i>Bendegúz Richárd NYIKOS – Astrid IONESCU</i> .....	286
---	-----

**7. szekció (online): A fenntartható fejlődés globális és regionális vetületei**  
Session 7 (online): Global and Regional Aspects of Sustainable Development

<b>Németország elektromos személygépjármű exportja az Európai Unió tagállamaival</b> <i>Dr. KONKA Boglárka</i> .....	295
---	-----

<b>Fenntartható design - új megközelítések a terméktervezésben</b> <i>NÁDAS Gergely – Dr. habil. MOLNÁR László</i> .....	307
---	-----

<b>Challenges of the Adaptation Planning – Evolution of the Vulnerability Assessment Methodologies</b> <i>Pál SELMECZI</i> .....	322
---	-----

<b>Szisztematikus irodalmi áttekintés a személygépjárművekbe épülő elektromos hajtáslánc gyártásáról a fenntarthatóság szempontjából</b> <i>Dr. TÓTH Árpád – BEGE András</i> .....	329
---	-----

<b>Németország az európai labdarúgás térképén – jogi és sportföldrajzi megközelítés</b> <i>Dr. ENGELBERTH István – Dr. VIRÁGH Árpád</i> .....	344
--	-----

<b>A körforgásosság mérési lehetőségeinek vizsgálata a szállodaüzemeltetésben</b> <i>KARAKASNÉ Dr. MORVAY Klára</i> .....	360
--	-----

<b>Az állami nyugdíjrendszerek fenntarthatóságának kihívásai</b> <i>SZABÓ Zsolt Mihály</i> .....	377
---	-----

<b>Competencies for Sustainable Development</b> <i>Zsuzsanna NAGYNÉ HALÁSZ</i> .....	391
---	-----



**8. szekció (online): Turizmus és marketing, fenntartható turizmus**  
Session 8 (online): Tourism and Marketing, Sustainable Tourism

**Gyógynövényturizmus és az abban rejlő lehetőségek**  
– Az Észak-Magyarországi kínálati oldal primer vizsgálata  
*PÁSZK Norbert* .....400

**Fiatal külföldi turisták pozitív és negatív tapasztalatai Budapesten**  
*Dr. habil. GROTTE Judit – MAGYAR Tímea* .....408

**Mit ígér Bükkfűdő? A városmárka-kommunikáció lehetséges eszközei és csoportosításuk a POE-modell alapján**  
*HORVÁTH Kornélia Zsanett* .....417

**9. szekció (online): Fenntartható gazdálkodás, körforgásos gazdaság**  
Session 9 (online): Sustainable Economy, Circular Economy

**Erdei biomassa lehetőségei és korlátai Magyarország energiabiztonságában**  
*VARGOVICS Máté – Dr. NAGY Dániel* .....433

**A körforgásos gazdaság és a soproni hulladékfeldolgozó stratégiája**  
*KASZA Lajos – Dr. NÉMETH Patrícia* .....444

**10. szekció (online): Sustainable Economy, Management and Development**  
Session 10 (online): Sustainable Economy, Management and Development  
(session in English)

**Comparison of the Density of Physicians and General Practitioners in the Hungarian Csongrád-Csanád Country and in the Territorial Units of Vojvodina for the Period 2002-2020**  
*Dr. Ivana KOCSICSKA* .....453

**The Re-Consideration of Business Diplomacy and Corporate Social Responsibility for International Business in the Post-Covid-19 World**  
*Anh Tuan TRAN* .....463

**Examining the Process of Project Preparation**  
*Attila LEGOZA* .....474

**The Relativity between Sustainable Management and Turnaround Management: Evidences and Suggestions for the Hungarian Agricultural Sector**  
*Zsuzsanna VARGA – Dr. habil. Etelka KATITS – Dr. Éva SZALKA – Dr. Ildikó PALÁNYI – Katinka MAGYARI* .....484

**Developing countries and Sustainability**  
*Arjana KADIU – Dr. habil. Zoltán SZABÓ* .....504

**The Effect of Supply Chain Management in Achieving Sustainability in Supply Chain in Four Seasons Hotel in Syria**  
*Wael ALASFAR* .....519

**The Role of EGTCs and Euroregions in Economic Cooperation Across  
the Hungarian-Romanian Border Between the Period 2007-2020**

*Melinda BENCZI* ..... 531

**11. szekció (online): Poszter szekció**

Session 11 (online): Poster Session

**Procrastination and its Influencet on Retirement Saving Plann**

*Khaliunaa DASHDONDOG* .....540

**Színházi kommunikáció 2.0**

**Hazai kőszínházak jelenléte Facebookon és Instagramon a pandémia első évében**

*Dr. DÉR Cs. Dezső – Dr. habil. PAPP-VÁRY Árpád Ferenc – ZRINYI Ivett* .....554

**A felnőttképzésben résztvevő álláskeresők elhelyezkedési esélyei**

**Szabolcs-Szatmár-Bereg megyében**

*LE-DAI Barbara* .....575

**Cost Analysis of Sustainable Concrete Production Using Waste Nanoparticles**

*Omar ZINAD – Dr. habil. Csilla CSIHA – Prof. Dr. Alya'a Abas AL-ATTAR* .....585

## **The Effect of Supply Chain Management in Achieving Sustainability in Supply Chain in Four Seasons Hotel in Syria**

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### **Abstract**

The purpose of this paper is to investigate the effect of supply chain management in achieving sustainability in supply chain in four seasons hotel in Syria. In addition, it aims to assessing the level of awareness and understanding the concepts of supply chain management and sustainable supply chain in the Syrian context. The research methodology involved a survey as a research strategy and quantitative approach, utilized a self-administered questionnaire, to arrive at the major findings of the study. The type of research is a single cross-sectional design in which the collection of data from the respondents was carried out only once. Data was analyzed using the statistical package for social sciences (SPSS). The paper revealed that there is an effect of supply chain management in achieving sustainability in supply chain in four seasons hotel in Syria. It also revealed that there is a high level of awareness among the respondents about the concepts of supply chain management and sustainable supply chain. As far as the researcher is aware, this paper is the first to investigate the effect of supply chain management in achieving sustainability in supply chain in four seasons hotel in Syria.

*Keywords:* Supply Chain, sustainability, Supply Chain Management (SCM), Sustainable Supply Chain

*JEL Codes:* D80, Q01, Q56

### **1. Introduction**

In the last decade, many business organizations have tended to adopt the concept of sustainability, and there has become a great interest in the issue of supply chain management and focus on its sustainability, given that traditional supply chain management covers all activities related to the flow and securing of raw materials for the organization and then to the final consumer, while sustainability in supply chain seeks to take social, environmental and economic dimensions into account.

In view of the growing interest in sustainability issues from an environmental, economic and social perspective, and organizations adopting the philosophy of social responsibility of the organization and including it as one of the mechanisms for achieving the competitive advantage of the organization, the researches interested in sustainable supply chain management have grown, and many organizations have tended to integrate both supply chain management with sustainability to achieve cooperation between the organization and suppliers to preserve the environment and provide clean products with a limited negative impact on the environment while achieving reasonable profitability for the organization.

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## **2. Research problem & question**

The problem of the study goes back to the fact that hotels in Syria are affected by many challenges, and the great damage in the tourism sector, which has been affected by political and economic factors in Syria and the region. As most organizations operate in a work environment characterized by intensive competition, change in the needs and desires of customers and changing market conditions. Therefore the organization is required to build strong relationships with suppliers through efficient and effective supply chain management, and work to secure the best types of support to achieve the set goals.

Considering the above, the problem of research can be identified by the following main question: To what extent does supply chain management affect the achieving of a sustainable supply chain in four seasons hotel in Syria?

## **3. Literature review**

### ***3.1. Evolution of supply chain management***

In the 1950s and 1960s, most manufacturers emphasized mass production to minimize unit production cost as the primary operations strategy, with little product or process flexibility. New product development was slow and relied exclusively on in-house technology and capacity. Bottleneck operations were cushioned with inventory to maintain a balanced line flow, resulting in huge investment in work in process (WIP) inventory. Sharing technology and expertise with customers or suppliers was considered too risky and unacceptable and little emphasis appears to have been placed on cooperative and strategic buyer supplier partnership. The purchasing function was generally regarded as being a service to production, and managers paid limited attention to issues concerned with purchasing. In the 1970s, Manufacturing Resource Planning was introduced, and managers realized the impact of huge WIP on manufacturing cost, quality, and new product development and delivery lead-time. Manufacturers resorted to new materials management concepts to improve performance within the “four walls” of the company (Tan, 2001).

The evolution of supply chain management continued into the 1990s accompanied by increasing logistics and inventory costs and the trend toward market globalization, the challenges associated with improving quality, manufacturing efficiency, customer service, and new product design and development also increased. To deal with these challenges, manufacturers began purchasing from a selected number of certified, high- quality suppliers with excellent service reputations and involved these suppliers in their new product design and development activities as well as in cost, quality, and service improvement initiatives. This is done so by reducing the supply base as much as a single supplier and enter into a long term agreement as strategic alliance in doing their business. As companies began implementing supply chain management initiatives, they began to understand the necessity of integrating all key business processes among the supply chain participants enabling the supply chain to act and react as one entity (Ensermu, 2013).

### ***3.2. Supply chain management definitions***

The Council of Supply Chain Management Professionals (CSCMP) (2004), a leading professional organization promoting SCM practice, education, and development, defines SCM as:

“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers..” Thus, the supply chain

encompasses all activities involved in the production and delivery of a final product or service, from the supplier's supplier to the customer's customer." (CSCMP, 2013, p. 187.)

In essence, supply chain management integrates supply and demand management within and across companies, CSCMP emphasizes that SCM encompasses the management of supply and demand, sourcing of raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, and distribution and delivery to the customer.

Cooper et al. (2007) define SCM as the management and integration of the entire set of business processes that provides products, services and information that add value for customers.

Several authors have defined supply chain management, Christopher (2003), New and Payne (1995), and Simchi-Levi et al. (2000) define supply chain management as "the integration of key business processes among a network of interdependent suppliers, manufacturers, distribution centers, and retailers in order to improve the flow of goods, services, and information from original suppliers to final customers, with the objectives of reducing system-wide costs while maintaining required service levels" (Stapleton et al., 2006, p. 108.).

The Global Supply Chain Forum (GSCF) defines supply chain management as "the integration of key business processes from end user through original suppliers, that provides products, services, and information that adds value for customers and other stakeholders" (Lambert et al., 1998, p. 1.).

Green et al. (2008, p. 317.) stated that the APICS dictionary (1995) describes SCM as – "the processes from initial raw materials to the ultimate consumption of the finished product, linking across supplier-user companies".

A supply chain is a network of organizations performing various processes and activities to produce value in the form of products and services for the end customer (Christopher, 2003).

SCM concerns the integrated and process-oriented approach to the design, manage and control of the supply chain, with the aim of producing value for the end customer, by both improving customer service and lowering cost (Giannoccaro & Pontrandolfo, 2002).

Lummus and Vokurka (1999, p. 13.) summarize SCM as "all the activities involved in delivering a product from raw material through to the customer, including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities".

According to Li et al. (2006) the dual purpose of SCM is to improve the performance of an individual organization as well as that of the entire supply chain.

Council of Logistics Management (CLM) definitions clearly establish that SCM is more broadly conceived than merely "logistics outside the firm" (Lambert, 2004, p. 18.).

Recent research supports this conception, portraying SCM as a strategic level concept (Stank et al., 2005).

### ***3.3. Supply chain performance indicators***

Supply chain performance is a two-dimensional definition which consists of effectiveness & efficiency, Effectiveness is about "doing the right things" & efficiency is about "doing things right". Supply chain effectiveness relates to the preference of the end-consumer & the sole indicator is consumer satisfaction (Bowersox et al., 2006).

Conversely, supply chain efficiency relates to the objective performance of processes. Efficiency indicators measure an output level against an input level (Agus, 2011).

The supply chain operations reference (SCOR) model was introduced in 1996 by the Supply Chain Council, which is a global organization of firms interested in SCM. The SCOR

model advocates hundreds of performance metrics used in conjunction with five performance attributes: reliability, responsiveness, flexibility, cost, and asset metrics (Cousins et al, 2006).

Sabry (2015) states that in modern SCM, quality is taken as a given and that factors in quality management and improvement are somewhat separate from those in SCM development.

Supply Chain Council (2006) presents five attributes of SC performance as quoted by Sillanpää (2011):

1. *SC reliability*: The performance of the SC in delivering the correct product to the correct place, at the correct time, in the correct condition and packaging, in the correct quantity, with the correct documentation, to the correct customer.
2. *SC responsiveness*: The speed at which a SC provides products to the customer.
3. *SC flexibility*: The agility of a SC in responding to marketplace changes to gain or maintain competitive advantage.
4. *SC costs*: The costs associated with operating the SC.
5. *SC asset management*: The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of the both assets: fixed and working capital.

### **3.4. Sustainable Supply Chain Management**

Sustainable supply chain management (SSCM) is defined as “the strategic, transparent integration and achievement of an organization’s social, environmental and economic goals in the systematic coordination of key organizational business processes for improving the long-term economic performance of the individual and its supply chain”. This definition highlighted that specific sustainable strategies should apply to all partners in the supply network (Carter & Rogers, 2008).

Furthermore, it indicates that sustainability cannot be achieved without integrating sustainable supply chain management practices in both the upstream and downstream partners. (Age-ron, et al., 2011).

The sustainability concept has increasingly become important in business operations and supply chain management. Research shows that price is no longer the only guide for competition but ecological, health and welfare benefits are involved collectively (Penker, 2006).

In addition to the ongoing pressure from increased globalization and increased competition, the higher demands for safety and security, environmental protection, lack of scarce resources, social and ethical issues have induced immense pressure on supply chain managers (Cuthbertson et al., 2011).

Therefore, supply chain managers are now compelled to implement additional strategies and policies to meet sustainability challenges in their business operations and sustainable supply chain management has increasingly become important. The social and environmental aspects are associated with acquisition of raw materials and resources, producers and the product itself. For example, a company will achieve a high reputation if it uses fewer natural resources, production processes are less environmental damaging, and comply with ethical social and environmental policies (Van der Vorst et al., 2005).

These characteristics would increase the competitive advantage for such a company with increasing the long-term sustainability.

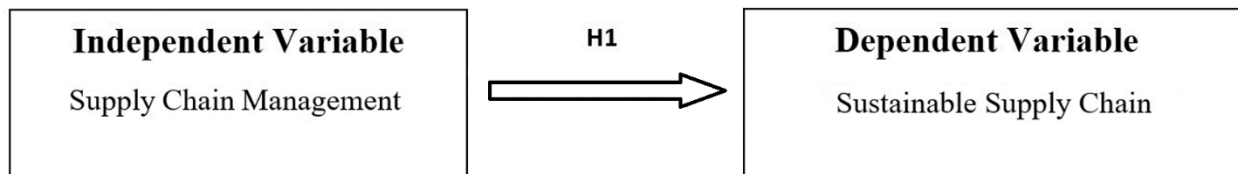
#### 4. Research hypothesis, variables & model

Considering the research problem and its question, the hypothesis is formulated as follows:

**Hypothesis H1:** "There is a statistically significant effect of supply chain management in achieving sustainability in supply chain at the level of significance ( $\alpha \leq 0.05$ )".

The present study relied on supply chain management as an independent variable (X), and on achieving sustainability in supply chain as a dependent variable (Y).

Considering the above, the model of the study will be as follows:



**Figure 1: Research Model**  
Source: Prepared by the researcher

#### 5. Research methodology

##### 5.1. Study Population and Sample

The population of this study are hotels in Syria, four seasons hotel as a case study. The volume of the sample was determined by using the form of Krejcie and Morgan (1970, p. 607.) as the following:

$$n = \frac{p(1-p)}{\frac{p(1-p)}{N} + \frac{E^2}{SD^2}}$$

where n: sample volume; N: community volume; p: 0.5; E: 5% and SD: 1.96. Since N=93 which is the total number of the workers in four seasons hotel, so by using the above formula we find that n=75. The questionnaire had been administrated personally, (90) questionnaires were distributed, (75) returned and analyzed with a (84%) response rate.

##### 5.2. Instrument validity and reliability

**Validity:** The questionnaire was reviewed by four experts from the Faculty of Economics at Damascus University, whose knowledge and experiences were sufficient in this scope and to make sure that each item is measuring exactly what is intended to be measured. Furthermore, a pilot study was conducted on 30 respondents to test the research instrument before distributing it to the whole sample. Upon the feedback of the experts and the pilot study the questionnaire had been amended taking into consideration their suggestions, comments, and directions to achieve the validity of the instrument. **Reliability:** Reliability is the extent to which a variable (or set of variables) is persistent in what is intended to measure (Sekaran, 2003). The Cronbach's Alpha value used to test the reliability of the items measuring each variable. A reliability measure coefficient reflects how well items in a set are positively correlated to one another. Accordingly, the internal consistency method was used in this study to examine the reliability of each variable.

Table 1 below shows that all the values of alpha are above 0.60, which are considered to be acceptable.

**Table 1: Summary of Reliability Analysis**

Components	Cronbach's Alpha	Number of Items
<i>Supply Chain Management</i>	0.807	4
<i>Sustainable Supply Chain</i>	0.728	4
<b>Total</b>	<b>0.835</b>	<b>8</b>

Source: SPSS outputs

### 5.3. Internal consistency validity

#### 5.3.1. For Supply chain Management

**Table 2: Pearson Correlation for Supply Chain Management**

Sentences	Pearson Correlation	Sig. (2-tailed)
Our hotel seeks to build long relationships with its suppliers	.808**	.001
Our hotel involves its suppliers in planning and development	.859**	.001
The relationship with the suppliers is based on trust, commitment and mutual benefits	.881**	.001
Our hotel continuously measures and evaluates the supplier's satisfaction	.882**	.001

Source: SPSS outputs

The Pearson Correlation value for all sentences is more than 0.5, which can be considered moderately correlated.

#### 5.3.2. For Sustainable Supply Chain

**Table 3: Pearson Correlation for Sustainable Supply Chain**

Sentences	Pearson Correlation	Sig. (2-tailed)
The SCM in our hotel try to minimize damage to environment & comply with legislations.	.829**	.001
The SCM in our hotel considers the social & economic impact in buying choices.	.809**	.001
The SCM in our hotel considers what the procured products are made of & how they are transported.	.781**	.001
The SCM in our hotel considers how the procured products eventually are disposed of.	.865**	.001

Source: SPSS outputs

The Pearson Correlation value for all sentences is more than 0.5, which can be considered moderately correlated.

### 5.4. Correlation analysis

As indicated in the table (4) the Pearson correlation test was conducted between supply chain management and sustainability in supply chain, the results shows that supply chain management is positively and significantly correlated with sustainability in supply chain. In other words, supply chain management and sustainability in supply chain have a genuine, strong, and positive relationship with correlation coefficient of 0.630 ( $r=0.630$ ) and significance value less



than 0.01. This implies that supply chain management is positively contributing to sustainability in supply chain and there is a genuine positive relationship between supply chain management and sustainability in supply chain.

**Table 4: Correlation analysis between Supply Chain Management and Sustainability in supply chain**

Correlations			
Construct		Supply Chain Management	Sustainability in supply chain
<i>Supply Chain Management</i>	Pearson Correlation	1	.630**
	Sig. (2-tailed)		.000
	N	75	75
<i>Sustainability in supply chain</i>	Pearson Correlation	.630**	1
	Sig. (2-tailed)	.000	
	N	75	75

\*\**. Correlation is significant at the 0.01 level (2-tailed).*

Source: SPSS outputs

### 5.5. Test of normality

Based on table 5 we find that **Sig** for all variables is more than (0.05), so all data are subject to normal distribution.

**Table 5: Test of Normality for the variables**

Statistics		Supply chain management	Sustainable supply chain
N	Valid	75	75
	Missing	0	0
Mean		3.8533	3.7289
Std. Deviation		.95741	1.08039
Skewness		-1.389	-.845
Std. Error of Skewness		.277	.277
Kurtosis		1.732	-.048
Std. Error of Kurtosis		.548	.548

Source: SPSS outputs

### 5.6. Descriptive statistics of the data

#### 5.6.1. Supply Chain Management

Table 6 below depicts the Mean and Standard Deviation for supply chain management, the values were calculated based on the answers from the respondents.

**Table 6: Descriptive Statistics of the Data for Supply chain Management**

Supply Chain Management	N	Mean	Std. Deviation	Test Value = 3		
				t	df	Sig. (2-tailed)
Our hotel seeks to build long relationships with its suppliers	75	3.8400	1.12754	6.452	74	0.000
Our hotel involves its suppliers in planning and development	75	3.8267	1.10739	6.465	74	0.000
The relationship with the suppliers is based on trust, commitment and mutual benefits	75	3.8233	1.10659	6.452	74	0.000
Our hotel continuously measures and evaluates the supplier's satisfaction	75	3.899	1.10521	6.219	74	0.000
<b>Supply Chain Management</b>	75	3.8533	0.95741	7.719	74	0.000

Source: SPSS outputs

Based on the data collected from the respondents the mean of the data after the calculation was 3.8533, which is more than 3.4 and less than 4.2, and Sig is 0.000 less than 0.05, so the workers agree to the content of the sentences. This means the respondents demonstrate optimal level of attitude towards supply chain management. In other words, the respondents show positive attitude towards supply chain management.

### 5.6.2. Sustainable Supply Chain

Table 7 depicts the Mean and Standard Deviation for sustainable supply chain, the values were calculated based on the answers from the respondents.

**Table 7: Descriptive Statistics of the Data for Sustainable Supply Chain**

Supply Chain Management	N	Mean	Std. Deviation	Test Value = 3		
				t	df	Sig. (2-tailed)
The SCM in our hotel try to minimize damage to environment & comply with legislations.	75	3.7333	1.25562	5.058	74	0.000
The SCM in our hotel considers the social & economic impact in buying choices.	75	3.7733	1.36137	4.919	74	0.000
The SCM in our hotel considers what the procured products are made of & how they are transported.	75	3.6800	1.40616	4.188	74	0.000
The SCM in our hotel considers how the procured products eventually are disposed of.	75	3.5432	1.42154	4.195	74	0.000
<b>Sustainable Supply Chain</b>	75	3.7289	1.08039	5.843	74	0.000

Source: SPSS outputs

Based on the data collected from the respondents the mean of the data after the calculation was 3.7289, which is more than 3.4 and less than 4.2, and Sig is 0.000 less than 0.05, so the workers agree to the content of the sentences. This means the respondents demonstrate optimal level of attitude towards sustainable supply chain. In other words, the respondents show positive attitude towards sustainable supply chain.

## 6. Hypotheses tests

**Main Hypothesis H1:** "There is a statistically significant effect of supply chain management in achieving sustainability in supply chain at the level of significance ( $\alpha \leq 0.05$ )".

In order to test the impact of supply chain management in achieving sustainability in supply chain, a simple linear regression method was used, between the supply chain management as independent variable, and sustainability in supply chain as dependent variable, as shown in the following tables:

As shown in Table 8 below, there is a causal relationship between supply chain management and sustainability in supply chain, the correlation coefficient (R) is 0.453, which is greater than zero, that indicates to a positive relationship between supply chain management and sustainability in supply chain.

The square of the correlation (R Square value) is 0.205, which indicates that (20.5%) of the volatility and variability in sustainability in supply chain is explained by supply chain management. In other words, the (R Square) value of 0.205 implies (20.5%) relative contribution of supply chain management in interpreting sustainability in supply chain, the remaining (79.5%) of the changes in the change can be attributed to other factors.

The adjusted R Square is 0.194, which implies that supply chain management can account for (19.4%) of the variation in sustainability in supply chain. Although there might be many factors that can explain the variable in achieving sustainability in supply chain, nearly (19.4%) of it is explained by supply chain management. This means that the remaining (80.6%) of the variation in sustainability in supply chain cannot be explained by supply chain management.

**Table 8: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.453	.205	.194	.96621

Source: SPSS outputs

Table 9 shows the ANOVA results of the regression analysis. The significance value of 0.000, which is less than 0.05, indicates that the regression relationship is significant in predicting the effects of supply chain management in achieving sustainability in supply chain, that implies that there is a significant impact of supply chain management in achieving sustainability in supply chain. The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data, the F-ratio shows a value of 18.828 which is greater than the F critical, and P-value is 0.000, that indicates that the model used for the study is well fitted, as well as it implies that the model is appropriate and significant.

**Table 9: ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	17.577	1	17.577	18.828	.000
Residual	68.150	74	.934		
Total	85.727	75			

Source: SPSS outputs

Table 10 describes that supply chain management with significance of 0.000 which is less than 0.05 has a positive effect in achieving sustainability in supply chain. The positive B-value of 0.531 at tolerance level (4.339) implies that supply chain management has a positive influence

in achieving sustainability in supply chain, meaning that any increase in supply chain management will cause an increase in sustainability in supply chain multiplied by 0.531.

The Regression model can be formulated as the following: Sustainability in supply chain = 1.750 + 0.531 (Supply Chain Management).

**Table 10: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.750	.477		3.667	.000
1 Supply chain management	.531	.122	.453	4.339	.000

Source: SPSS outputs

Based on the above tables, we accept the null hypothesis, which means there is a statistically significant effect of supply chain management in achieving sustainability in supply chain at the level of significance ( $\alpha \leq 0.05$ ).

## 7. Summary of Major Findings

According to the data analysis in the previous sections, summary of the findings presented as follows:

- The majority responses on supply chain management scores a mean greater than 3.4, which implies the fact the concerned hotels implement the concepts and practices of supply chain management.
- The majority responses on sustainable supply chain scores a mean greater than 3.4 which implies the fact the concerned hotels implement the concepts and practices of sustainable supply chain.
- The result from the study shows that there is significantly strong correlation between supply chain management and sustainable supply chain, with correlation coefficient of 0.630 ( $r=0.630$ ) and significance value less than 0.01. This implies that supply chain management is positively contributing to sustainable supply chain and there is a genuine positive relationship between supply chain management and sustainable supply chain.
- The finding from simple linear regression analysis between supply chain management and sustainable supply chain shows the correlation coefficient (R) is 0.453, which is greater than zero, that indicates to a positive relationship between supply chain management and sustainable supply chain, which means there is a statistically significant impact of supply chain management in sustainable supply chain at the level of significance ( $\alpha \leq 0.05$ ).

## 8. Conclusion

The correlation analysis and regression analysis show a significant positive correlation between supply chain management and sustainable supply chain, meaning that there is a statistically significant effect of supply chain management in achieving sustainability in supply chain at the level of significance ( $\alpha \leq 0.05$ ). The workers of four seasons hotel demonstrate optimal level of attitude (positive) towards supply chain management and sustainability. However, additional tests and data collections will be needed to come to a more conclusive result as to whether supply chain management is an important factor in analyzing sustainable supply chain.

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