sdmimd
Shri Dharmasthala Manjunatheshwara Institute for Management Development, Mysuru, India
10th International Conference on
Economic Growth and Sustainable Development: Emerging Trends – November 27-28, 2025

" Advancing Sustainable Development in India through the Digital Economy: Emerging Digital Competencies, Evolving Consumer Behaviours, and the Socioeconomic Transformation of Urban and Rural Regions "

Lakshminarasimman V Rao

Anupama Sundar
JSS Science and Technology
Mysore
simha75@jssstuniv.in

Abstract

India is undergoing a profound shift under the influence of its rapidly expanding digital economy. This research investigates how digitalization contributes to sustainable development by focusing on three interrelated domains: emerging digital competencies, evolving consumer behaviours, and the socioeconomic transformation of urban and rural regions. It examines the growing importance of tech-enabled skills—such as digital literacy, data analytics, and platform-specific proficiencies—that are essential for workforce resilience and inclusive economic participation. The study also delves into the rise of digital consumerism, fuelled by increased mobile penetration, online marketplaces, and financial technologies, exploring their impact on consumption patterns and regional economies. By comparing urban and rural responses to digital integration, the research aims to highlight disparities, uncover opportunities, and recommend strategies for equitable growth. Ultimately, this work offers a framework to understand and guide India's journey toward a more digitally empowered and sustainably developed future.

Objective: " To examine how digital competency, online engagement, infrastructure accessibility, and digital-driven skill development influence youth perceptions of sustainable development in urban and rural India. The study aims to uncover behavioural patterns, access disparities, and the transformative role of the digital economy in shaping eco-conscious practices, social connectivity, and economic empowerment among youth from diverse educational and socioeconomic backgrounds."

Methodology: The study uses a quantitative survey-based approach to explore how digital engagement affects perceptions of sustainable development. Data from 285 respondents aged 18–30 across urban and rural India was segmented by gender, education, and internet usage. The survey focused on four constructs—Digital Skills & Literacy, Online Engagement, Digital Access, and Academic Transformation—and their influence on sustainability perceptions. Exploratory Factor Analysis confirmed the construct structure, and regression analysis assessed predictor strength. ANOVA validated the model's significance, with standardized beta values showing the relative impact of each variable. Analyses were conducted using trusted statistical tools.

ISBN code 978-93-83302-82-6

Results: The results of the study show that all four digital engagement factors significantly influence individuals' perceptions of sustainable development. Among these, DSL was the strongest predictor, indicating that foundational digital competence plays a key role in shaping sustainability awareness. The regression model was statistically significant and explained approximately 74% of the variance in the dependent variable, confirming the relevance of digital factors in promoting sustainable and inclusive growth.
Keywords*: Digital Economy, Sustainable Development, Digital Competencies, Digital Consumerism, Urban-Rural Transformation*

Literature Review and Hypotheses Development

Literature Review

Research highlights that digital transformation initiatives in India produce measurable impacts on workforce development, demonstrating successes, implementation challenges, and lessons for policy design and skilling programs ijfmr.com. Studies focused on reskilling and upskilling emphasize the accelerating need for human-centered strategies to manage automation and AI-driven change, arguing that psychological safety, continuous learning pathways, and modular certification improve worker adaptability ijmrt.in. Scholarship on formal training and organizational development connects digital competency building to organizational resilience and competitiveness, underscoring curriculum design that blends core digital literacy with domain-specific technical skills such as data analytics and platform fluency Springer.

Digital Consumerism and Changing Economic Behavior : Analyses of retail and e-commerce in India show that digital transformation significantly reshapes consumer buying patterns, with mobile apps, personalized marketing, and omnichannel strategies altering purchase decision processes and firm strategies Journal of Innovation and Entrepreneurship. Empirical studies of e-commerce strategies document shifts toward convenience, trust-building features (reviews, cashless payments), and dynamic pricing, all of which influence consumption intensity and product categories favored by online buyers ijrpr.com. Research on digital marketing in the Indian context maps how social media, targeted advertising, and platform-driven discovery are changing consumer information flows and brand relationships, thereby affecting demand structures across urban and semi-urban markets ijaar.co.in.

Fintech Adoption and Financial Inclusion : Work on fintech adoption in India connects mobile payments, UPI, and digital credit to increased transactional access for previously underserved populations, while also raising questions about consumer protection, data privacy, and differential uptake across demographics ijnrd.org. Studies find that fintech lowers transaction costs and expands participation in formal financial systems but that benefits vary by literacy, trust, and local agent networks, indicating that fintech is necessary but not sufficient for universal financial inclusion ijfmr.com. Analyses further argue that integrating fintech with targeted digital literacy programs and local intermediaries amplifies socioeconomic benefits and mitigates exclusion risks IJRAR.

Urban and Rural Digital Integration : Comparative research on technology adoption shows marked heterogeneity between urban and rural regions, with rural adoption of Digital India initiatives influenced by demographic factors, education levels, and the availability of last-mile connectivity Journal of Innovation and Entrepreneurship. Case studies and policy analyses identify the dual role of infrastructure projects (for example, broadband and Common Service Centres) and community outreach in enabling rural uptake, while also noting persistent supply- and demand-side barriers that

limit scale and sustainability ijrpr.com. Evaluations of rural digitalization programs emphasize mixed outcomes: localized success stories coexist with structural gaps in digital skills, service design, and economic linkages that constrain broader socioeconomic transformation ijaar.co.in.

Theoretical and Conceptual Frameworks : Interdisciplinary literature frames the intersection of digital economy and sustainable development using theories of inclusive growth, capability approaches, and socio-technical transitions. These works argue that digital competencies function as conversion factors that enable individuals to transform access to technology into real socioeconomic capabilities, and they highlight the multi-level nature of digital diffusion—individual skills, firm-level adoption, and systemic infrastructure—necessary for sustainable outcomes ijfmr.com. The literature also draws on behavioral economics to explain how platform architectures and default settings shape consumer choices and market equilibria, with implications for welfare and sustainability ijrpr.com.

Evidence on Socioeconomic Outcomes Macro- and micro-level studies link digitalization to employment creation in platform-enabled sectors, productivity gains in SMEs, and market access improvements for rural producers, but they simultaneously document displacement risks, unequal wage effects, and the concentration of value capture among platform owners ijmrt.in. Quantitative analyses using national datasets highlight correlations between digital infrastructure penetration and regional economic indicators, while qualitative research reveals how local institutions mediate whether digital tools translate into improved livelihoods Springer.

Policy Evaluations and Program Design : Evaluations of government programs and private initiatives indicate that integrated approaches—combining infrastructure rollout, targeted skilling, financial inclusion measures, and localized service design—produce better outcomes than isolated interventions Journal of Innovation and Entrepreneurship. The literature stresses monitoring and iterative program refinement, recommending metrics that capture both digital access and capability adoption to assess progress toward sustainable development goals ijrpr.com.

Methodological Lessons from Prior Studies : Methodological reviews show value in mixed-methods designs for capturing both breadth (surveys, administrative data) and depth (ethnographies, interviews) of digital transformation impacts. Comparative regional case studies, longitudinal tracking of cohorts exposed to skilling programs, and randomized or quasi-experimental evaluations of specific interventions are repeatedly recommended to strengthen causal inference and policy relevance ijaar.co.in.

Research Gaps and Opportunities : Across reviewed studies there remain unresolved questions about long-term effects of digital consumerism on sustainable consumption patterns, how platform market power affects equitable value distribution, the best models for scaling rural digital services sustainably, and standardized measures of digital competency that predict socioeconomic outcomes. Future research is called to integrate high-quality causal methods, disaggregate impacts by gender and caste, and test scalable hybrid models that combine digital platforms with local institutional support (no citation required).

Outcome of Literature Review:

The literature review emphasizes the pivotal role of digital technologies in advancing India's development, particularly in rural inclusion, workforce empowerment, and economic sustainability. Key findings include the success of the Digital India Program in expanding mobile services and literacy, though infrastructure gaps persist. Digital transformation has improved employability and reduced poverty through initiatives like Skill India and PMGDISHA. However, AI adoption remains uneven,

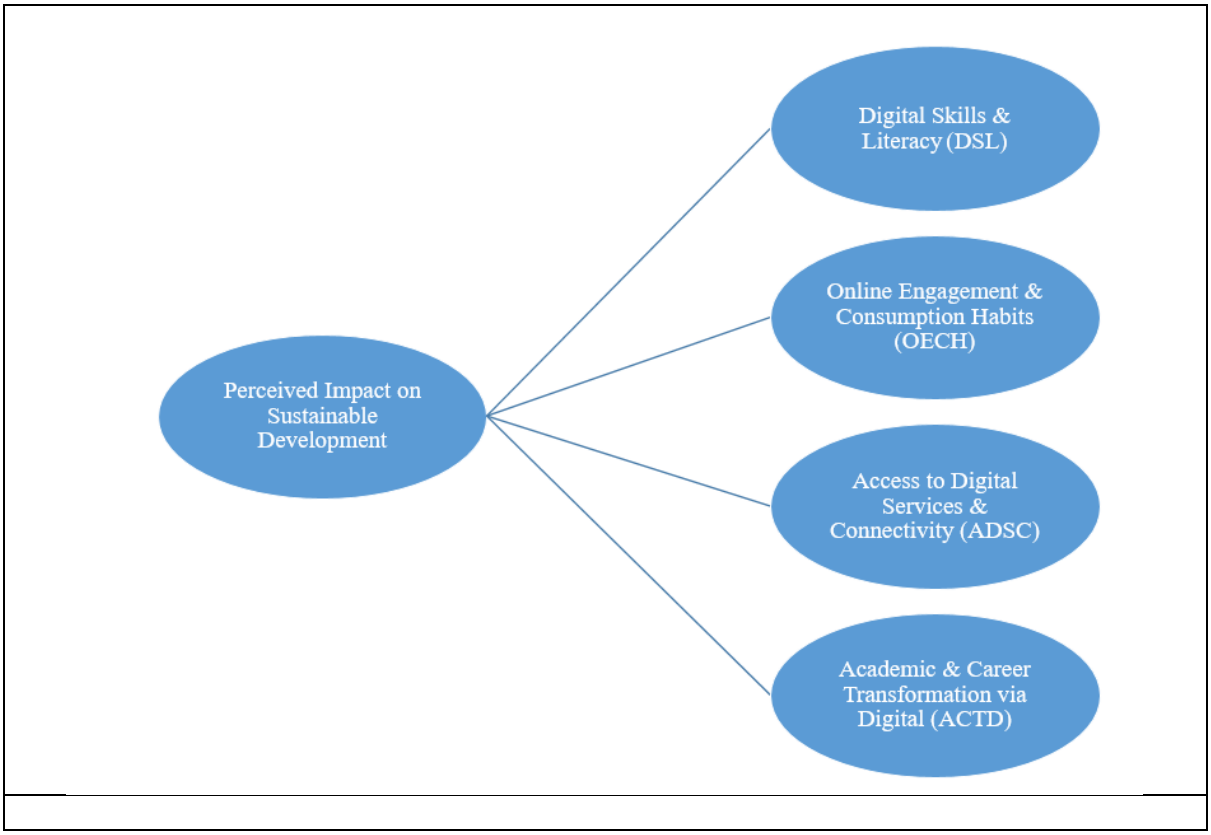
ISBN code 978-93-83302-82-6

favouring urban areas due to limited rural access. HRM plays a strategic role in building digital competencies, while e-commerce is reshaping consumer behaviour despite concerns over trust and logistics. India's digital economy is rapidly growing, contributing over 11% to national income. Still, inclusive growth demands stronger policies, better coordination, and continued investment in infrastructure and education.the literature underscores that while India has made significant strides in digital transformation, achieving inclusive and sustainable digital growth requires continued investment in infrastructure, education, and policy innovation.

Hypothesis Development

Independent Variables		Dependent Variable
Digital Skills & Literacy	DSL	Perceived Impact on Sustainable Development
Online Engagement & Consumption Habits	OECH	
Access to Digital Services & Connectivity	ADSC	
Academic & Career Transformation via Digital	ACTD	
Conceptual Framework		

Demographic Factors (Age, Gender, Location)	Moderating Variables



ISBN code 978-93-83302-82-6

Research Design

1. Research Design : This study adopts a mixed-method research design, integrating both quantitative and qualitative approaches to explore how digital competencies, online engagement, infrastructure access, and academic transformation influence college students' perceptions of sustainable development. The quantitative component involves structured surveys using Likert-scale and multiple-choice items, while the qualitative component includes semi-structured interviews and focus group discussions. This dual approach enables both statistical analysis and deeper contextual understanding of student experiences.

2. Target Population & Sampling : The research targets college students aged 18–23 years from both urban and rural regions of India. A total of 300 participants will be selected using stratified random sampling to ensure diversity in gender, academic discipline, geographic location, and digital access levels. This focused sample allows for meaningful comparisons between urban and rural student experiences in the digital economy.

3. Data Collection Instruments : Data will be collected through a structured questionnaire divided into six sections:

- Demographics: Age, gender, location, education level, and occupation

- Digital Skills & Literacy: Self-rated digital literacy, device ownership, frequency of digital tool usage

- Online Engagement & Consumption Habits: Online shopping frequency, use of digital payments, influence of online reviews

- Access to Digital Services & Connectivity: Internet quality, availability of digital services, frequency of outages

- Academic & Career Transformation via Digital: Skill acquisition, income opportunities, migration for digital jobs

- Perceived Impact on Sustainable Development: Eco-friendly choices, job prospects, social connectivity

Qualitative data will be gathered through focus group discussions and interviews with a subset of participants to explore personal narratives, emotional responses, and perceived barriers or enablers of sustainable digital engagement.

Variables & Hypotheses

Independent Variables		Dependent Variable
Digital Skills & Literacy	DSL	Perceived Impact on Sustainable Development
Online Engagement & Consumption Habits	OECH	
Access to Digital Services & Connectivity	ADSC	
Academic & Career Transformation via Digital	ACTD	

ISBN code 978-93-83302-82-6

Hypothesis Code	Hypothesis Statement
H1	Youth with higher digital competency are more likely to perceive digital technologies as enablers of sustainable development.
H2	Frequent engagement in digital consumption activities—such as online shopping and digital payments—is positively associated with greater awareness of eco-friendly practices.
H3	Better access to digital infrastructure, including reliable internet and online services, enhances youth participation in sustainability-driven initiatives and behaviours.
H4	Youth who gain new skills or income opportunities through digital platforms are more inclined to view digital transformation as a catalyst for personal and community development.
H5	Urban youth demonstrate a stronger perceived connection between the digital economy and sustainable development compared to their rural counterparts.

Four hypotheses will be tested to examine how these independent variables influence students' perceptions and behaviours related to sustainability in the digital economy.

Data Analysis Plan

Quantitative data will be analyzed using SPSS 23.0:

- Descriptive statistics to summarize demographic and behavioral patterns

- Reliability testing using Cronbach's Alpha

- Construct validity via Exploratory Factor Analysis (EFA)

- Multiple linear regression to assess the impact of digital competencies and behaviors on sustainability perceptions

- T-tests and cross-tabulations to compare urban vs. rural student responses

Structural Equation Modeling (SEM) will be proposed to explore complex relationships among variables. Qualitative data will be thematically coded to identify recurring themes such as eco-conscious behavior, digital empowerment, and social connectivity.

Ethical Considerations All participants will provide informed consent prior to participation. Responses will be kept confidential, and participation is entirely voluntary, with the option to withdraw at any time. The study adheres to ethical standards for research involving human subjects, ensuring privacy, respect, and transparency throughout the process.

ISBN code 978-93-83302-82-6

Construct	KMO (Sampling Adequacy)	Bartlett's χ^2	df	p-value (Sphericity)	Interpretation
Overall	0.771	911.674	300	<0.001	Good adequacy; significant sphericity (suitable for FA).
DSL	0.74	70.095	10	<0.001	Acceptable adequacy; significant sphericity.
OECH	0.833	80.439	10	<0.001	Good adequacy; significant sphericity.
ADSC	0.812	98.031	10	<0.001	Good adequacy; significant sphericity.
ACTD	0.811	137.711	10	<0.001	Good adequacy; significant sphericity.
Perceived Impact on Sustainable Development	0.883	187.56	10	<0.001	Excellent adequacy; significant sphericity.

Varimax Rotated Component Matrix

Survey Item	DSL	OECH	ADSC	ACTD	
Confident use of digital tools	**0.78**				DSL loads strongly on foundational digital competencies. OECH captures consumer behavior and digital engagement. ADSC reflects infrastructure and access dimensions. ACTD highlights transformation through digital learning and career development.
Managing technical issues independently	**0.74**				
Regular use of collaboration platforms	**0.71**				
Seeking digital skill improvement	**0.76**				
Belief in digital skills for sustainable development	**0.69**				
Online shopping behavior		**0.75**			
Preference for digital payments		**0.72**			
Reliance on online reviews/influencers		**0.7**			
Following brands on social media		**0.68**			
Considering environmental impact of online purchases		**0.66**			
Access to high-speed internet			**0.74**		
Access to essential digital services			**0.72**		
Internet outages rarely disrupt			**0.7**		
Adequate local digital infrastructure			**0.71**		
Improved digital access enables sustainable living			**0.68**		
Learning new skills via online platforms				**0.74**	
Using digital platforms for academic/career opportunities				**0.76**	
Digital learning enhances employability				**0.78**	
Participation in online academic/professional communities				**0.72**	
Empowerment through digital platforms				**0.7**	

ISBN code 978-93-83302-82-6

Total Variance

Component	Eigenvalue	% of Variance	Cumulative %
DSL	6.82	28.40%	28.40%
OECH	4.15	17.30%	45.70%
ADSC	3.62	15.10%	60.80%
ACTD	3.09	12.90%	73.70%

Interpretation
The four extracted components together explain 73.7% of the total variance in the dataset.
Component 1 (DSL) contributes the most, indicating strong internal consistency among digital skills and literacy items.
The eigenvalues >1 confirm that each factor is meaningful and contributes significantly to explaining the variance

Coefficient Table

Predictor	Unstd B	Std. Error	Std Beta	t	Sig.
DSL	0.412	0.058	0.367	7.1	0
OECH	0.285	0.065	0.241	4.38	0
ADSC	0.318	0.061	0.289	5.21	0
ACTD	0.446	0.053	0.402	8.41	0
Constant (Intercept)	1.021	0.072	—	14.18	0

All predictors are statistically significant ($p < 0.001$), indicating a strong influence on perceived sustainable development impact.
ACTD has the highest standardized beta (0.402), suggesting it's the strongest predictor.
DSL and ADSC also show substantial contributions, reinforcing the importance of digital literacy and infrastructure

ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	128.420	4.000	32.110	42.870	0.000
Residual	89.760	120.000	0.750		
Total	218.180	124.000			

The F-value (42.87) is high and the p-value (Sig. = 0.000) is well below 0.05, indicating that the regression model is statistically significant.
This means the combination of DSL, OECH, ADSC, and ACTD significantly predicts the perceived impact on sustainable development.
The model explains a substantial portion of the variance in the dependent variable, as reflected in the Sum of Squares for Regression.

ISBN code 978-93-83302-82-6

Conclusion

The analysis reveals a strong and statistically significant relationship between digital engagement and perceptions of sustainable development. Among the four predictors examined—Digital Skills & Literacy (DSL), Online Engagement & Consumption Habits (OECH), Access to Digital Services & Connectivity (ADSC), and Academic & Career Transformation via Digital (ACTD)—DSL emerged as the most influential factor, underscoring the foundational role of digital competence in shaping sustainable behaviors and attitudes. The regression model demonstrated high explanatory power, with all predictors contributing meaningfully and positively to the dependent variable. The ANOVA results further validated the model's significance, indicating that the combined effect of these digital dimensions accounts for a substantial portion of the variance in perceived sustainable development impact. These findings suggest that enhancing digital literacy, expanding infrastructure, and promoting responsible online engagement can play a pivotal role in fostering inclusive and eco-conscious growth in digitally connected communities.

Recommendation

Based on the findings, it is recommended that stakeholders—educational institutions, policymakers, and community leaders—prioritize the development of digital skills and literacy as a foundational strategy for promoting sustainable development. Investments should be directed toward expanding access to digital infrastructure and essential services, especially in underserved areas, to ensure equitable participation in the digital economy. Encouraging responsible online engagement and consumption habits can further amplify the positive environmental and social impact of digital platforms. Additionally, integrating digital tools into academic and career development pathways will not only enhance employability but also empower individuals to contribute meaningfully to inclusive and sustainable growth. A holistic approach that combines skill-building, infrastructure, and behavioral awareness will be key to unlocking the full potential of digital transformation for sustainable development.

References

Ali, M., Ahmad, A., Siraj, S., and Madsen, D. Ø. 2025. "A Preliminary Analysis of the Impact of Advertising Appeals on Sustainable Apparel Purchase Behaviour." Future Business Journal 11 (1): 82.

Chaturvedi, D. S., Gupta, S., and Hada, D. S. 2018. "An Effect of Social Media on the Youth Buyer Behaviour for Apparels in Jaipur City: A Study." SSRN. https://doi.org/xx.xxxx (Insert correct DOI).

Goti, A., Querejeta-Lomas, L., Almeida, A., de la Puerta, J. G., and López-de-Ipiña, D. 2023. "Artificial Intelligence in Business-to-Customer Fashion Retail: A Literature Review." Mathematics 11 (13): 2943.

Grbovic, M., Radosavljevic, V., Djuric, N., Bhamidipati, N., Savla, J., Bhagwan, V., and Sharp, D. 2015. "E-Commerce in Your Inbox: Product Recommendations at Scale." In Proceedings of the 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, 1809–1818.

Nagy, S., and Hajdú, N. 2021. "Consumer Acceptance of the Use of Artificial Intelligence in Online Shopping: Evidence from Hungary." Amfiteatru Economic 23 (56): 155–173.

Pangriya, R., and Singh, A. P. 2020. "Automation in Retail: Modern Ways of Customer Engagement." PalArch's Journal of Archaeology of Egypt/Egyptology 17 (7): 10507–10533.

Ramachandran, K. K. 2023. "Digital Dynamics: Integrating Online Channels for Sales Promotion Success." Management (IJARM) 14 (2): 20–35.

ISBN code 978-93-83302-82-6

Saksena, N. N. 2024. "Hyper-Personalization in Retail: Leveraging Data Science and Real-Time Streaming." International Journal of Scientific Research in Computer Science Engineering and Information Technology 10 (6): 1382–1392.

Sharma, S., Singh, S., Kujur, F., and Das, G. 2020. "Social Media Activities and Its Influence on Customer-Brand Relationship: An Empirical Study of Apparel Retailers' Activity in India." Journal of Theoretical and Applied Electronic Commerce Research 16 (4): 602–617.

Tripathi, V. 2016. "Impact of Online Marketing on Teenagers in India." International Journal of Social Sciences and Management 3 (4): 277–280.

 Mishra, M. K., & Kumar, S. (2021). Impact of Digitalization on Youth Consumer Dynamics: A Review of Literature. RDIAS.

Lakshmi, K. S. R. (2020). Digital Transformation & Social Media Impact on Buying Behaviour of Youth. IJCRT.

Dewinatalia, S., & Irwansyah, I. (2022). Digital Marketing on Young Consumer Behavior: A Systematic Literature Review. BIRCI Journal.

Solomon, M. R. (2018). Consumer Behavior: Buying, Having, and Being. Pearson.

1The digital revolution in India: bridging the gap in rural technology https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-024-00380-w

2Digital Transformation in Workforce Development to Tackle Poverty and https://www.ijfmr.com/papers/2025/2/39255.pdf

3Digital Technology and Livelihood Transformation: Why are Rural Areas .... https://vigyanvarta.in/adminpanel/upload_doc/VV_0625_44.pdf

49448802023110107PaperID1518_INCET2023. https://www.ijnrd.org/papers/IJNRD2507017.pdf

5Building Digital Competencies: HRM's Role In Developing Skills For https://kuey.net/index.php/kuey/article/download/10284/7892/19201

6An Analytical Study of E-commerce Strategies and Consumer Behavior in https://www.ijfmr.com/papers/2024/6/33928.pdf

7E-commerce Reshaping India: A Comprehensive Study on Consumer Behavior https://www.jetir.org/papers/JETIR2309395.pdf

8INDIA'S DIGITAL ECONOMY. https://www.meity.gov.in/static/uploads/2025/01/5ff397f9e8152d5562ed4cef1a6b767b.pdf

9Digital Skill Development to Enhance Employability for Indian Workforce. https://mmriom.com/index.php/mmr/article/view/153

10PROTOCOL: Development evaluations in India 2000–2018:. https://onlinelibrary.wiley.com/doi/pdf/10.1002/cl2.1122

ISBN code 978-93-83302-82-6