

**A SYSTEMATIC REVIEW ON ‘ADOPTING ICT FOR FINANCIAL
INCLUSION: CHALLENGES AND OPPORTUNITIES IN INDIAN
CONTEXT**

Satish Malik¹ and Dr. Sumita Dave²

¹Research Scholar, Management, Amity Business School, Raipur, Chattisgarh, India

²Dean- Faculty of Management & Commerce, Director- Amity Business School, Raipur,
India

Abstract

Technology is the key point of differentiation (PoD) between the developed and developing economies of the world. It has introduced the major revolutionary developments in the form of automation, scalability, feasibility, governance, public welfare and social equity. The world economy has witnessed digital disruption and role of information and communication technology in coping with volatility, uncertainty, complexity and ambiguity factors. In addition, COVID-19 pandemic outbreak restricts the growth due to series of phases and lockdown. ICT enables the governments, institutions, businesses to minimize the existing challenges and maximize the opportunities in terms of financial inclusion, innovation and digital infrastructure for India. ICT tools empower the stakeholders of society in raising the awareness, improving financial literacy, better and faster access to financial services and reaching to large population in less time with better accuracy, transparency, accountability etc. (Sharma & Kukreja, 2013). This article reviews the emerging trends in ICT, identifies the major challenges for financial inclusion, analyzes role and contribution of ICT in achieving the goal of financial inclusion for sustainable development in India.

Keywords: *Financial Inclusion, Information and Communication Technology (ICT), Sustainable Development, Financial Literacy, Systematic Review, VUCA*

1. Introduction:

The digitalization has been proving as one of strategic moves towards sustainable development for any national economy. ‘Digital India’ is one such initiative taken by Government of India. The United Nations Organizations has prepared Sustainable Development Vision 2030 in which 17 Sustainable Development Goals (SDGs) are identified. The governments of respective countries are encouraged to align their policies accordingly. Financial inclusion is one of the prime important goals considered (Abel, Mutandwa & Roux, 2018). The world economy has witnessed digital disruption and role of information and communication technology in coping with volatility, uncertainty, complexity and ambiguity factors. In addition, COVID-19 pandemic outbreak restricts the growth due to series of phases and lockdown. In such global turmoil, a developing economy like India can concentrate on making an effective use of ICT for survival, growth and sustainable development. It enables the governments, institutions, businesses to minimize the existing challenges and maximize the opportunities in terms of financial inclusion, innovation and digital infrastructure for India. ICT tools empower the stakeholders of society in raisin the awareness, improving financial literacy, better and faster access to financial services and reaching to large population in less time with better accuracy, transparency, accountability etc. (Sharma & Kukreja, 2013). The present paper aims to explore the emerging trends of ICT and its scope of application for financial inclusion within the context of COVID-19 pandemic in India from sustainable development point of view.

2. Review of Literature:

The technology works like an invisible hand for sustainable development and financial inclusion in India. Empirical evidence suggests financial literacy’s positive impact on financial behaviour and financial status in a number of behavioural domains. Financially-literate individuals do better at budgeting, saving money, and controlling spending; handling mortgage and other debt; planning for retirement; and ultimately, successfully accumulating wealth (Cabeza-García, Del Brio & Oscanoa-Victorio, 2019).

The apex banking body, Reserve Bank of India (2021) prepared ‘National Policy for Financial Education: 2020-2025.’ It is observed that one of the biggest components of financial inclusion is financial literacy. The smartphone technology and social media enable

people to develop the skills, knowledge or get information about financial instruments. In spite of keeping a top priority, the financial inclusion has become a challenge for the government, policy makers, economists and organizations. A number of factors influence the financial inclusion. The last mile connectivity, absence of reliable infrastructure, poor governance, the large size of unbanked population, loan defaulters, lack of accountability, corruption are some of the major challenges in India (Sil, 2020). The information and communication technology can identify risks, minimize them and maximize inclusive growth by bridging demand-supply gap in India.

World Bank (2017) defines “Financial Inclusion as individual and businesses having access to useful and affordable financial products and services that meet their needs for transactions, payments, savings, credit and insurance, delivered in a responsible and sustainable way.” The concept of financial inclusion gained the momentum when the world realized and understood its importance for poverty reduction, social equity and regional balance. The prime objective of financial inclusion is to deliver banking and other financial services in an affordable, accurate, transparent and timely manner to the vast section of vulnerable groups of society who are disadvantaged and low-income classes (Abubakar, Daneji, Muhammed & Chekene, 2020).

The information and communication technology revolutionized the marketplaces, business world, communities through various tools (UNO, 2011). The emerging trends in the finance world are visible in the new forms such as ‘Digital-First InsurTech’, ‘Neo Banking’ etc. The contact less, cash-free, autonomous finances have increased market penetration in India. It gained the momentum during COVID-19 pandemic.

The government of India has already initiative several campaigns such as Digital India, Skill India, Start-Up India to transform India as a manufacturing hub, knowledge hub, pool of talented workforce capitalizing the global opportunities (Sahyaja & Rao, 2018). However, it would remain dream without digital infrastructure, women empowerment, quality and skill-based education. The central government already introduced the ‘New Education Policy 2020’ in India. Massive Open Online Courses, Moodle, NPTEL, Google Classrooms/Meet, Zoom enable the institutions to continue teaching-learning during the pandemic as well. A

primary school teacher, Mr. Ranjitsinh Disale from Maharashtra bagged ‘The Global Teacher Award’ worth US\$ 1 Million for effective application of embedding QR Code in NCERT textbooks (India Today, 2020). It is an epitome how ICT can be used in education and integrated with Right To Education (RTE) brining thousands of drop-out students in the mainstream of society.

3. Rationale of Study:

In the present context of COVID-19 global pandemic, the individuals, societies, organizations, governments and economies have suffered badly since April 2019. It has long-term and severe impact. The growth of Indian economy has become standstill in the global turmoil. Lockdown series have almost stopped the lives of people, shut down businesses, school/colleges etc. In addition, growing population increases the stress on existing resources. Meeting the diverse needs become challenging for governments (Lechman & Marszk, 2019).

4. Problem Statement:

It is observed that approximately 1.1 billion of the 2 billion unbanked individuals around the world are women. In developing countries like India, the vulnerable groups have to face many challenges while getting access to financial services (Sil, 2020). The present paper identifies the major challenges for financial inclusion in India and analyzes how various ICT tools such as websites, mobile applications and social media (WhatsApp and Facebook) can contribute in achieving the goal of financial inclusion towards sustainable development taking care of people, planet and profits. In addition, it explores how ICT has performed during pandemic outbreak to overcome the challenges.

5. Objectives of Study:

- To study the major areas of concern regarding financial inclusion in India
- To explore the evolving trends in ICT in India
- To analyze the influence of ICT on various sectors in India during COVID-19 pandemic
- To examine the implications while adopting ICT towards financial inclusion in India

6. Research Methodology:

The research method applied for the present study is the Systematic Literature Reviews (SLR). It is a method used to identify, evaluate, analyze and construe the relevant existing literature. The keywords such as “Financial Inclusion”, “Digital Finance”, “FinTech”, “Information and Communication Technology (ICT)”, “Sustainable Development”, “Inclusive Growth” etc. are used to collect data in the form of research articles, working papers, industry reports, case studies etc. from reputable databases like Reserve Bank of India, IBEF, Scopus, Science Direct, Research Gate, India Today, Google Scholar and other resources which are relevant and latest with respect to the topic of present study. There were thirty-three articles, working papers and case studies collected. However, after shortlisting, twenty research studies (twelve research papers, one book, one case study, three international reports, one international survey, one Bulletin and one working paper) were reviewed in-depth relevant to topic and publications from 2005 to 2022.

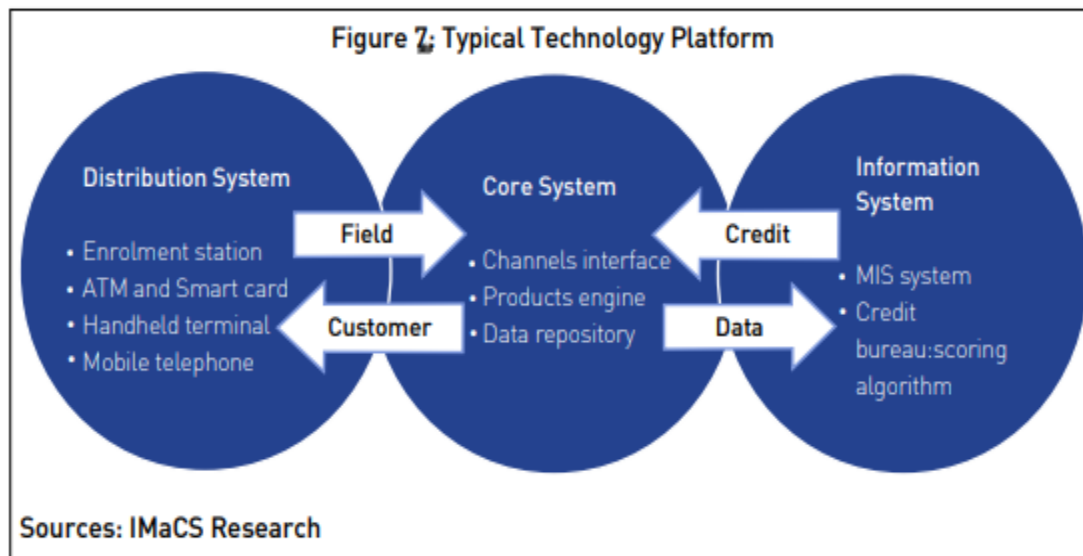
7. Discussion and Analysis:

The term ‘financial inclusion’ is used within the world of finance providing better facilities to the needy and poor strata of society. The Rangrajan Committee presented an exclusive report on Financial Inclusion in 2008. The below figure indicates the list of facilities covered under financial inclusion.



The various facilities include products (bank accounts), entrepreneurial credit, loans, insurance, mortgage, payments, remittance services, financial advices etc. It was reinstated in

Pittsburg Summit held in September, 2009 of G20 Summit. It is expected that the financial inclusion prepares the ground for banking, non-banking and insurance players in India with healthy competition.



The information and communication technology can contribute towards financial literacy, quality education, affordable and effective banking services minimizing the rural-urban, rich-poor, literate-illiterate, male-female differences leading to societal balance. Hence, the present study analyzes the contribution of ICT towards financial inclusion in India. The finance is core element for people, profitability, stability and sustainable development.

Table 1: Thematic Analysis: ICT, Financial Inclusion and Inclusive Growth

Sr. No.	Author & Year of Publication	Title	Research Study	Topic Covered
1	María-Jesús Gallego-LosadaAntonio Montero-NavarroElisa García-	Digital financial inclusion. Visualizing the academic literature	Article	Financial Inclusion- Affordable, adequate and widespread access to a sufficient range of financial products and services; Contributing towards poverty eradication;

	AbajoRocío Gallego- Losada (2023)			Developing economies facing inequality and macroeconomic growth challenges restricting FI
2	Costa, T. P. D., Gillespie, J., Pelc, K., Shenker, N., Weaver, G., Ramanathan, R., & Murphy, F. (2023).	An Organisational- Life Cycle Assessment Approach for Internet of Things Technologies Implementatio n in a Human Milk Bank.	MDPI Article	Digital Technologies used for preserving milk products for sustainable business (screening, cold storage, quality control, supply chain, e-vehicles and life cycle assessment
3	Mhalanga David (2021)	Financial Inclusion in Emerging Economies: The Application of Machine Learning and Artificial Intelligence in Credit Risk Assessment	Research Paper	Credit risk- a focused area for sustainable banking; AI and ML proving as a risk mitigation tools for credit appraisals for loan approvals and disbursements as well; Risk prediction model- 95% accuracy maintained in Europe
4	Gopi, J. & Williams, R. (2021)	Emergence of Artificial Intelligence	Research Paper	Artificial intelligence- outshining human performances, product innovation, service excellence;

		and Its Role in Promoting New Products and Services		Applications- Gaming, Natural Language Processing, Image Processing, Virtual Personal Assistant, Fraud Detection, Security Surveillance, Handwriting Recognition
5	Verma, M. & Naveen, B. R. (2020)	COVID-19 Impact on Buying Behaviour	Research Paper	COVID-19 as disruption in lifestyle and consumer buying behaviour; technology causing impulse buying; Economic nationalism
6	Sil, N.(2020)	Research Perspectives on Financial Inclusion for Inclusive Growth in Indi	Research Paper	A positive relationship amongst availability of banking services, savings, digital payments, health, employment, inclusive growth in India
7	India Brand Equity Organization (IBEF) 2020	Technology Application for Financial Inclusion	International Report	Branchless banking, mobile banking, Bank on Wheels; Integrated ITeS, Wireless Application Protocol (WAP), Near Field Communication (NFC), GPRS
8	Lechman, E. & Marszk, A. (2019).	ICT-Driven Economic and Financial Development	Book	The effects of ICT diffusion on economic and financial development; shifts observed in labour markets, international trade activities productivity factors, education and use of innovative financial products; Technology in

				Society; 5th Technological Revolution
9	Hendriks, S. (2019).	The role of financial inclusion in driving women's economic empowerment	Case Study	A significant relationship between financial inclusion and women empowerment; micro finance, family finance, help in decision-making of saving, investment, emergency fund, government scheme benefits
10	Sahyaja & Rao, K. S. (2018)	The Role of Information and Communication Technology (ICT) in Financial Inclusion	Research Paper	A survey of 150 rural households in Krishna District, Andhra Pradesh; ICT useful for Banking without discrimination, Branchless Banking, Mobile Banking, Biometric ATM, Agent/Correspondent Banking, and Kisan Credit Cards). 50% respondents opined they had no information about financial services, 60.07% didn't access financial services because they didn't know documentation process.
11	Chatterjee, A. & Das, A. (2018)	Information and Communication Technology Diffusion and Financial Inclusion: An Interstate	Working Paper	Increased % of rural and women amongst unbanking population; mobile and internet- key players in ICT revolution in India; role of ICT in poverty alleviation, economic growth, employment opportunities

		Analysis for India		
12	Singla, A. & A. (2017)	“Financial literacy in India- an Appraisal	Research Paper	Financial literacy- a major concern in social equity, restricting the scope of financial inclusion and sustainable development
13	Sahay & Others. (2015)	Financial inclusion: Can It Meet Multiple Macro-economic Goals?	Research Paper	Challenges- Lack of financial literacy, poor infrastructure, digital divide, absence of digitalization
14	International Monetary Fund (2015a)	Financing for development – revisiting the Monterrey Consensus	International Report	Finance for all-inclusive growth; social equity, infrastructure, optimum utilization of resources
15	Standard and Poor's & Gallup (2014)	S&P Global FinLit Survey	International Survey	More than 75% Indians were found financially illiterate. 73% men and 80% women - financially illiterate (gender gap)
16	World Bank (2014)	Global Financial Development Report 2014	International Report	Use of technology for better efficiency of resources, government reforms, internet banking, e-governance, product innovation and value chain system

17	Kumar, N. (2013)	Financial inclusion and its determinants: evidence from India	Research Paper	Bank branch network, employee base, industrial development, infrastructure and technology as determinant factors of financial inclusion
18	Ghosh, J. (2013)	Microfinance and the challenge of financial inclusion for development	Research Paper	Lack of awareness, least financial literacy, social inequality, poor quality of education, no community acceptance, demand-supply mismatch, regional imbalance
19	Basant, S. (2011)	Profitable Models for Financial Inclusion	Review Paper	Public Private Partnerships (PPIs); Digitalization; E-Governance
20	Manij, A. (2010)	Eliminating poverty? 'Financial inclusion'	Research Paper	Financial Inclusion for poverty eradication, land resource management & gender equality
21	Akhter, S. H. (2007)	Globalization, expectations model of economic nationalism, and consumer behaviour	Research Paper	Globalization influencing world and Indian economy; technology ruling the business world; Digital disruption changes market dynamics
22	Leeladhar, V. (2006)	Taking Banking Services to the	RBI Bulletin	ICT- Bridging demand-supply gap, integrating the products and services with customization,

		Common Man –Financial Inclusion		network of network
23	Dewan S. & K. L. Kraemer (2000)	Information Technology and Productivity: Preliminary Evidence from Country-level Data	Research Paper	Outsourcing, Automation, Customization, Integration and Accessibility through IT

Table 2: ICT Contribution towards Financial Inclusion

Challenges	ICT Tools	ICT Contribution in Financial Inclusion
Lack of Financial Literacy	Web-based / mobile learning/ online workshops	Mobilization, resource integration, counselling, training
Women Empowerment	Bank on Wheels; Online Workshops/Courses	Community development programs; Counseling, financial education
Vulnerable Factors (Volatility, Uncertainty, Complexity and Ambiguity)	Integrated ICT System	Network of Network system, integration with multiple departments, cells etc.
Lack of communication	Satellites, Smartphone technology, Social media	Satellite/Wireless Communication; group messages
Increasing Population & Demand of Financial Services	Branchless banking, mobile banking, Neo-Banking	Financial education programs for vulnerable groups, backward classes

Raising awareness	Social Media (Facebook, WhatsApp etc.)	Creating Community Pages, Groups, Taskforce groups, Quiz etc.
Capacity Building	Mobile Apps, Websites, e-learning platforms	E-Learning, E-Training to NGOs, Self-Help Groups Communities, Officers
Poor infrastructure/ project management	Digital Infrastructure	e-Governance, Single Window System
Lack of funding	Cloud-computing, FinTech, Automation, Outsourcing to ITeS	Corporate Social Responsibility, ICT for Insurance, Micro-finance
Outdated Technology	Artificial Intelligence, Machine Learning, Internet of Things	Customized module design and development
Poor Decision-making, lack of accountability	Decision Support Systems Methods; Just-In-Time Tools	Tracking real-time progress with turn-around-time (TAT) with high level transparency and accountability at all levels
Reports & Documentation	Cloud Computing, Central Databases, Shared Services	Dashboards generate & store automated reports
Lack of Innovation and Research	Gamification, Machine Learning, Internet of Everything	Simulation, Collaborative research, online market surveys
Coordination gap amongst various government department	Central Database Management System, Servers, Routers	Development of phase-wise modules
Limited/Unskilled Workforce	Virtual Personal Assistants	Contribution towards data collection, query resolution, customer care

Malpractices & Non-Compliance	QR Coding, Use of Software, Embedded and Encrypted Systems, Biometric ATMs	Fraud Detection, Security Surveillance, Handwriting Recognition, Image Processing,
-------------------------------	--	--

8. Findings of Study:

The present study has the following findings:

1. Technology not only helps in mobilizing the resources but also in optimizing them from automation, outsourcing etc.
2. ICT has great potential to overcome many challenges faced by developing economies like India and provide better, affordable access to maximum people of economy.
3. Lack of financial literacy, widening gap between rural and urban, gender and social inequalities, poor infrastructure, lack of awareness and education, faulty government policies, large number of unbanked population, increasing number of population, outdated technology, changing market dynamics, government reforms and globalization are the major challenges of financial inclusion in India. In addition, COVID-19 global pandemic outbreak has created many barriers for the same.
4. The Information and Communication Technology has different forms and functions. Depending on the purpose, expertise, budget and expected outcomes, it can be designed, developed and used to achieve the goal of financial inclusion. It can offer competitive advantages such as connectivity, accessibility, transparency, affordability, mass awareness, optimization of resources etc.
5. India can capitalize the smartphone and web-based technologies for raising the awareness, education, counselling, and training of financial inclusion for weaker sections of society. The rising number of FinTech firms in India is a sign of the same.
6. The financial institutions can make an effective use for product innovation, service excellence (m-banking, m-payment, neo-banking, contactless banking, bank on wheel etc.) for sustainable development.

7. The websites, mobile applications, online portals, software, social media platforms can be used to the great extent for financial inclusion in India.

9. Conclusion:

The information and communication technology has both merits and demerits too. However, if we use it for constructive and noble cause, it can enlarge the scope and provide better and wider range of services making our life comfortable. The effective use of ICT is beneficial for the individuals, communities, societies, governments, organizations and economies too. A developing and populated country like India can consider it and implement for better financial inclusion minimizing the demand-supply gap and maximizing inclusive growth opportunities in future. ICT can be considered as a game changer for financial inclusion. Human and artificial intelligence can create win-win situations for sustainable development of people, planet and profits as well.

References

- Abel, S., Mutandwa, L., & Le Roux, P. (2018). A Review of Determinants of Financial Inclusion. *International Journal of Economic and Financial Issues*, 8(3), 1–8.
- Abubakar, A. M., Daneji, B. A., Muhammed, A. I., & Chekene, I. A. B. (2020). Driving Faster Financial Inclusion in Developing Nations. *Technology Audit and Production Reserves*, 2/4(52), 35–40.
- Akhter, S. H. (2007). Globalization, Expectations Model of Economic Nationalism, and Consumer Behaviour. *Journal of Consumer Marketing*, 24(3), 142–150.
- Asteriou, D., & Hall, S. G. (2015). *Applied Econometrics*. Macmillan International Higher Education.
- Avais, M. (2014). Financial Innovation and Poverty Reduction. *International Journal of Scientific and Research Publications*, 4(1), 2250–3153.
- Bassant, S. (2011), "Profitable Models for Financial Inclusion", *Compendium II; Layout 1, BANCON Review Papers*.

- Cabeza-García, L., Del Brio, E. B., & Oscanoa-Victorio, M. L. (2019). Female financial inclusion and its impacts on inclusive economic development. In *Women's Studies International Forum* (Vol. 77, p. 102300). Pergamon.
- Cetindamar, D., Gupta, V. K., Karadeniz, E. E., & Egrican, N. (2012). What the numbers tell: The impact of human, family and financial capital on women and men's entry into entrepreneurship in Turkey. *Entrepreneurship & Regional Development*, 24(1–2), 29–51.
- Costa, T. P. D., Gillespie, J., Pelc, K., Shenker, N., Weaver, G., Ramanathan, R., & Murphy, F. (2023). An Organisational-Life Cycle Assessment Approach for Internet of Things Technologies Implementation in a Human Milk Bank. *Sustainability*, 15(2), 1137.
- Demirgüç-Kunt, A., & Klapper, L. (2012). Financial inclusion in Africa: an overview. The World Bank. Working paper- 6088.
- Dewan S. and K. L. Kraemer (2000). Information Technology and Productivity: Preliminary Evidence from Country-level Data. *Management Science*, 46(4), 548–562.
- Ghosh, J. (2013). Microfinance and the challenge of financial inclusion for development. *Cambridge journal of economics*, 37(6), 1203–1219.
- Hendriks, S. (2019). The Role of Financial Inclusion in Driving women's Economic Empowerment. *Development in Practice*, 29(8), 1029–1038.
- India Today. (December 4, 2020). "Govt. School Teacher Ranjitsinh Disale wins Global Teacher Prize, Makes History by haring half with other finalists." Accessible on <https://www.indiatoday.in/education-today/news/story/govt-school-teacher-ranjitsinh-disale-wins-1-million-usd-global-teacher-prize-1746709-2020-12-04>
- International Monetary Fund (2015). Financing for development – revisiting the Monterrey Consensus. Washington: IMF Policy Paper. Available at: <http://www.imf.org/external/np/pp/eng/2015/061515.pdf>
- Kim, D. W., Yu, J. S., & Hassan, M. K. (2018). The influence of religion and social inequality on financial inclusion. *The Singapore Economic Review*, 1746003.
- Kumar, N. (2013). Financial Inclusion and Its Determinants: Evidence from India, *Journal of Financial Economic Policy*, Vol. 5 No. 1, pp. 4-19. <https://doi.org/10.1108/17576381311317754>

- Lechman, E. & Marszk, A. (2019). ICT-Driven Economic and Financial Development. Elsevier & Academic Press. DOI: <https://doi.org/10.1016/C2017-0-00344-0>
- Leeladhar, V. (2006), “Taking Banking Services to the Common Man – Financial Inclusion”, Reserve Bank of India Bulletin, Mumbai.
- Loukoianova, M. E., Yang, Y., Guo, M. S., Hunter, M. L., Jahan, M. S., Jamaludin, M. F., & Schauer, J. (2018). Financial Inclusion in Asia-Pacific. International Monetary Fund.
- María-Jesús Gallego-Losada Antonio Montero-NavarroElisa García-AbajoRocío Gallego-Losada (2023). Digital financial inclusion. Visualizing the academic literature. Research in International Business and Finance, 64-101862.
- Manij, A. (2010). Eliminating Poverty? ‘Financial inclusion’, Access to Land, and Gender Equality in International Development. The Modern Law Review, 73(6), 985–1004.
- Sahay, R., Čihák, M., N'Diaye, P. M. B. P., Barajas, A., Mitra, S., Kyobe, A., & Yousefi, S. R. (2015). Financial inclusion: Can It Meet Multiple Macroeconomic Goals?
- Sharma, A., & Kukreja, S. (2013). An Analytical Study: Relevance of Financial Inclusion for Developing Nations. International Journal of Engineering and Science, 2(6), 15–20.
- Standard & Poor’s & Gallup Inc. (2014). S&P Global FinLit Survey. Available at: <https://gflec.org/initiatives/sp-global-finlit-survey>
- Sil, N. (2020). Research Perspectives on Financial Inclusion for Inclusive Growth in India, Asian Journal of Economics, Finance and Management, Vol. (4): 140-161.
- World Bank (2014). Global Financial Development Report 2014: financial inclusion. Washington: World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/16238>