Fostering sustainable innovation: insurtech challenges and barriers for farmers in India

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Abstract- Investigating the impact of Insurtech on farmers' livelihoods in India, this study delves into how innovative practices can foster sustainability in agriculture. The research explores the role of Insurtech in promoting sustainable farming by providing improved insurance solutions tailored to the needs of farmers. By harnessing technology, Insurtech aims to enhance risk management, increase access to insurance services, and bolster financial resilience among farmers. The study examines how these innovations can contribute to long-term sustainability, mitigating the adverse effects of climate change and economic challenges. By understanding the potential of Insurtech in the agricultural sector, policymakers and stakeholders can develop targeted strategies to support farmers and foster sustainable practices that ensure the well-being of rural communities and the environment.

Keywords- Insurance, farmers, financial inclusion, technology, sustainable agriculture

I. INTRODUCTION

The vulnerability of Indian farmers due to limited access to insurance is a pressing concern. Shockingly, only about 25% of the total cropped area in India is covered by insurance schemes, leaving a significant majority of farmers without financial protection (National Sample Survey Office, 70th round; Tiwari, Chand, & Anjum, 2020). This exposes them to substantial risks from unpredictable weather events, pests, and crop failures. Additionally, a staggering 60% of small and marginal Indian farmers rely on informal sources of credit (Chatterjee & Krishnamurthy, 2020), highlighting the lack of formal financial services that could offer insurance coverage. This absence of insurance exacerbates the vulnerability of farmers, pushing them deeper into debt (Luc Christiaensen et al., 2022) when faced with unforeseen losses. Bridging this insurance gap and providing accessible insurance solutions is crucial to safeguarding the livelihoods of Indian farmers and enhancing their resilience in the face of agricultural uncertainties.

Traditional Indian insurance plans fail to cover the majority of farmers (Jha et al., 2021) due to several reasons. Traditional insurers struggle to reach farmers in rural areas as their distribution channels are primarily urban-focused (Shrey, 2022), with minimal rural outreach and physical presence. Small-scale farmers with limited financial resources cannot afford standard insurance plans. Moreover, the high premiums and rigorous underwriting of traditional insurance make it challenging for farmers to obtain coverage (Ghosh et al., 2020). Insurance product illiteracy, especially among vulnerable farming populations, further reduces adoption rates (Visser, Jumare, & Brick, 2020).

However, the limitations of traditional insurance can be overcome with new technologies like insurtech (Venkatesh, 2020). Insurtech leverages digital platforms, data analytics, and novel underwriting procedures to provide personalized and affordable insurance solutions (Saeed &Arshed, 2022; GSMA, 2020). By utilizing mobile technology, insurtech can reach remote rural areas where traditional insurers struggle to establish a presence (Sarkar, 2021), removing geographical constraints. Insurtech solutions offer more flexible payment options, lower premiums, and simplified claim processes, making insurance more reasonable and user-friendly for farmers (Saeed &Arshed, 2022). The use of satellite photography and weather data in insurtech allows for more accurate risk assessment and tailored insurance coverage for farmers (Benami et al., 2021).

The introduction of new insurance technologies presents a significant opportunity to bridge the gap and provide farmers with essential financial inclusivity and security (McIntosh &Mansini, 2018). Insurtech has the potential to revolutionize the insurance landscape for Indian farmers, offering them the protection they need to navigate the uncertainties of agricultural life successfully.

II. INSURTECH FOR AGRICULTURE

Insurtech, a blend of "insurance" and "technology," refers to the use of modern digital technologies and data analytics in the insurance sector, signaling a shift from traditional practices to technology-driven innovations. According to PWC (2017), insurtech encompasses various technological advancements like artificial intelligence, machine learning, the Internet of Things (IoT), and blockchain. These technologies enable insurers to enhance risk assessment, streamline processes, improve customer experiences, and create personalized insurance solutions (Sharma et al., 2022). Insurtech aims to make insurance more accessible, cost-effective, and tailored to individual

consumer needs through digital platforms (Venkatesh, 2020). The integration of technology in the insurance industry is transforming the landscape and presenting new possibilities for insurers, policyholders, and other stakeholders.

Challenges to adopt insurtech

III. TECHNOLOGY

The application of insurtech faces significant challenges due to the digital divide among farmers and technological limitations. Limited access to technology, particularly smartphones and internet connectivity, hampers farmers' engagement in insurtech projects (Duncombe, 2015). The digital gap further bars marginalized or resource-constrained farmers from benefiting from insurtech (Fisher et al., 2019). Additionally, low levels of digital literacy and technical proficiency present obstacles to adopting and using insurtech solutions (Bahn et al., 2021). To address these issues, interventions such as training programs, capacity-building projects, and awareness campaigns are necessary to enhance farmers' digital literacy and bridge the digital divide (McCampbell et al., 2021). Developing user-friendly interfaces and localized content can facilitate farmers' acceptance and utilization of insurtech platforms. To be truly inclusive and tailored to diverse farming communities, technology-based solutions must be accessible and adaptable (Anthony & Ferroni, 2012). Removing technology barriers and addressing the digital divide is crucial to ensuring that all farmers can benefit from insurtech, regardless of their technological capabilities and resources.

IV. DATA SECURITY

The implementation of insurtech has raised concerns about data security and privacy, particularly among stakeholders such as farmers (Spixii, 2021). The gathering and storage of private and sensitive data by insurtech systems have sparked privacy issues. To safeguard individuals' privacy rights and ensure secure data processing, it is crucial to establish strong data protection frameworks and regulations (OECD, 2017). The sharing and interchange of data among various participants in the insurtech ecosystem, including insurance providers, technology companies, and governmental organizations, also raise questions about data ownership, permission, and control (Office of the Privacy Commissioner of Canada, 2015). Transparent data governance and data sharing mechanisms are necessary to address these concerns and uphold the security and integrity of sensitive information (OECD, 2017). Additionally, robust cybersecurity measures are essential to protect the digital infrastructure and systems of insurtech platforms from potential data breaches and cyber threats (Cortis et al., 2018). To ensure responsible data usage and preservation, stringent privacy rules, data protection measures, and proactive cybersecurity strategies are vital components of any insurtech deployment (OECD, 2017).

V. INCLUSIVITY AND ACCESSIBILITY

Impoverished farmers face challenges in accessing insurtech projects due to financial constraints, limited digital literacy, and lack of awareness about insurtech (McCampbell et al., 2021). The digital divide further exacerbates the exclusion of marginalized farming communities who lack access to technology and the internet. Addressing these issues requires improving internet infrastructure in rural areas, providing digital literacy training, and educating marginalized farmers about insurtech. Localized and vernacular information can also enhance the accessibility of insurtech platforms for farmers from diverse linguistic backgrounds. Collaborations with grassroots organizations, community-based institutions, and local government are crucial forreaching marginalized farmers and meeting their specific needs. Proactive efforts to ensure inclusion and accessibility in insurtech initiatives can help marginalized farmers gain fair access to insurance and financial protection.

VI. CROP AND WHETHER VARIABILITY

The implementation of insurtech faces challenges due to crop and weather variability. The unpredictable nature of crop yields and weather patterns makes it difficult to calculate risk models and insurance prices (Abdi et al., 2022; Kogut, 2022). While insurtech solutions use data analytics and historical trends for risk analysis and pricing, the variability in crops and weather poses significant challenges (Lanfranchi & Grassi, 2021). Factors such as rainfall, temperature, pests, and diseases impact risk assessment and claim settlements (Kogut, 2022).

To address these issues, the integration of satellite imaging, remote sensing, and machine learning can improve risk assessment and expedite claims processing (Zheng et al., 2021). Collaborating with agricultural research organizations, meteorological agencies, and insurtech enterprises can enhance understanding and management of crop and weather variability (Schwarze&Sushchenko, 2022).

Insurtech projects have the potential to help farmers manage crop and weather variability by offering more comprehensive insurance coverage. By leveraging advanced technologies and partnerships with relevant stakeholders, insurtech can better address the challenges posed by crop and weather unpredictability, ensuring more effective risk management and support for farmers.

VII. CONCLUSION

In conclusion, this paper sheds light on the significant challenges and barriers faced by farmers in India regarding the adoption and implementation of insurtech. The digital divide, limited access to technology and internet connectivity, financial constraints, and low digital literacy have hindered the inclusion of impoverished and marginalized farming communities in insurtech projects. Moreover, the unpredictability of crop yields and weather patterns poses complexities for risk assessment and pricing in insurtech solutions. However, despite these obstacles, there is hope for overcoming these challenges. By focusing on improving internet infrastructure, providing digital literacy training, and enhancing insurtech education for farmers, the industry can work towards greater financial inclusion and resilience for the farming community. Collaborative efforts with agricultural research organizations, meteorological agencies, and insurtech enterprises can lead to better risk management strategies and improved understanding of crop and weather variability. Ultimately, by addressing these challenges head-on and working together, insurtech can play a transformative role in empowering farmers, providing them with comprehensive insurance coverage, and bolstering their financial security and prosperity in the face of uncertainties in the agricultural landscape.

VIII. REFERENCES

[1].Abdi, M. J., Raffar, N., Zulkafli, Z., Nurulhuda, K., Rehan, B. M., Muharam, F. M., … Tangang, F. (2022). Index-Based Insurance and hydroclimatic risk management in agriculture: A systematic review of index selection and yield-index modelling methods. International Journal of Disaster Risk Reduction, 67, 102653. doi:10.1016/j.ijdrr.2021.102653

[2].Anthony, V. M., & Ferroni, M. (2012). Agricultural Biotechnology and smallholder farmers in developing countries. Current Opinion in Biotechnology, 23(2), 278–285. doi:10.1016/j.copbio.2011.11.020

[3].Bahn, R. A., Yehya, A. A., &Zurayk, R. (2021). Digitalization for Sustainable Agri-Food Systems: Potential, status, and risks for the MENA region. Sustainability, 13(6), 3223. doi:10.3390/su13063223

[4].Benami, E., Jin, Z., Carter, M. R., Ghosh, A., Hijmans, R. J., Hobbs, A., … Lobell, D. B. (2021). Uniting Remote Sensing, crop modelling and Economics for Agricultural Risk Management. Nature Reviews Earth & Environment, 2(2), 140–159. doi:10.1038/s43017-020-00122-y

[5].Chatterjee , S., & Krishnamurthy22, M. (2020). Most small farmers outside formal credit system. Sitharaman's announcements won't help them Retrieved from https://theprint.in/opinion/most-small-farmers-outside-formal-credit-system-sitharamans-announcements-wont-help-them/422551/

[6].Cortis, D., Debattista, J., Debono, J., & Farrell, M. (2018). InsurTech. Palgrave Studies in Digital Business & Enabling Technologies, 71–84. doi:10.1007/978-3-030-02330-0_5

[7].Duncombe, R. (2015). Mobile phones for agricultural and Rural Development: A literature review and suggestions for future research. The European Journal of Development Research, 28(2), 213–235. doi:10.1057/ejdr.2014.60

[8].Fisher, E., Hellin, J., Greatrex, H., & Jensen, N. (2019). Index insurance and climate risk management: Addressing social equity. Development Policy Review, 37(5), 581–602. doi:10.1111/dpr.12387

[9].Ghosh, R. K., Gupta, S., Singh, V., & Ward, P. S. (2020). Demand for crop insurance in developing countries: New evidence from India. Journal of Agricultural Economics, 72(1), 293–320. doi:10.1111/1477-9552.12403

[10].GSMA. (2020). Agricultural insurance for smallholder farmers Digital innovations for scale. https://www.gsma.com/mobilefordevelopment/wpcontent/uploads/2020/05/Agricultural_Insurance_for_Smallholder_Farmers_Digital_Innovations_for_Scale.pdf

[11].Jha, N., Prashar, D., Khalaf, O. I., Alotaibi, Y., Alsufyani, A., & Alghamdi, S. (2021). Blockchain based Crop Insurance: A decentralized insurance system for modernization of Indian farmers. Sustainability, 13(16), 8921. doi:10.3390/su13168921

[12].Kogut, K. (2022). InsurTech for Risk Management. https://www.pwc.com/us/en/industries/financial-services/library/building-a-modernized-future-for-risk-management.html

[13].Lanfranchi, D., & Grassi, L. (2021). Examining insurance companies' use of Technology for Innovation. The Geneva Papers on Risk and Insurance - Issues and Practice, 47(3), 520–537. doi:10.1057/s41288-021-00258-y

[14].Luc Christiaensen, Z. R., Louise Fox, T. S. J., Blanke, J., Bogolo J. Kenewendo, A. U. O., Mulugetta, Y., &CemKarayalcin, H. O. (2022

[15].McCampbell, M., Schumann, C., & Klerkx, L. (2021). Good intentions in complex realities: Challenges for designing responsibly in digital agriculture in low-income countries. SociologiaRuralis, 62(2), 279–304. doi:10.1111/soru.12359

[16].McIntosh, C. (2018). The use of financial technology in the agriculture sector https://www.adb.org/publications/use-financial-technology-agriculture-sector

[17].OECD. (2017). Technology and innovation in the insurance sector -OECD. https://www.oecd.org/pensions/Technology-and-innovation-in-the-insurance-sector.pdf

[18].Office of the Privacy Commissioner of Canada. (2015). Privacy and cyber security. https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2014/cs_201412/
[19].PWC. (2017). Will insurers seize the opportunities of InsurTech?. https://www.pwc.com/us/en/industries/financial-services/library/insurtech-innovation.html
[20].Saeed, M., &Arshed, N. (2022). Big Data Analytics adoption in the Indian insurance industry: Challenges and Solutions. Big Data Analytics in the Insurance Market, 81–102. doi:10.1108/978-1-80262-637-720221005
[21].Sarkar, S. (2021). The evolving role of Insurtech in India: Trends, challenges and The road ahead. The Management Accountant Journal, 56(12), 30. doi:10.33516/maj.v56i12.30-37p
[22].Schwarze, R., &Sushchenko, O. (2022). Climate Insurance for Agriculture in Europe: On the merits of smart contracts and distributed Ledger Technologies. Journal of Risk and Financial Management, 15(5), 211. doi:10.3390/jrfm15050211
[23].Sharma, S., Srivastav, S., Gupta, A., &Manglick, A. (2022). Application of technology and innovation in Fintech and it's adaptability in India. 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM). doi:10.1109/iciptm54933.2022.9753933
[24].Shrey, A. (2022). The unexploited insurance market of rural India. https://timesofindia.indiatimes.com/blogs/voices/the-unexploited-insurance-market-of-rural-india/
[25].Spixii , S. (2021). The 3 key features any safe insurtech must have. https://www.spixii.com/blog/features-to-safeguard-your-data
[26].Venkatesh, G. (2020). Transformation of the insurance business model using Block Chain Technologies. SAMVAD, 20(0), 43. doi:10.53739/samvad/2020/v20/153419
[27].Venkatesh, G. (2020). Transformation of the insurance business model using Block Chain Technologies. SAMVAD, 20(0), 43. doi:10.53739/samvad/2020/v20/153419
[28].Visser, M., Jumare, H., & Brick, K. (2020). Risk preferences and poverty traps in the uptake of credit and insurance amongst small-scale farmers in South Africa. Journal of Economic Behavior & Organization, 180, 826–836. doi:10.1016/j.jebo.2019.05.007
[29].Zheng, C., Abd-Elrahman, A., & Whitaker, V. (2021). Remote Sensing and machine learning in crop phenotyping and management, with an emphasis on applications in strawberry farming. Remote Sensing, 13(3), 531. doi:10.3390/rs13030531