

# THE IMPORTANCE OF FINANCIAL INCLUSION FOR WOMEN'S EMPOWERMENT IN SEAWEED INDUSTRY AS A POTENTIAL RESOURCE FOR BLUE ECONOMY DEVELOPMENT

Lerissa Daniella<sup>a\*)</sup>, Tasya Zahwa Prayoga<sup>b)</sup>, R. S. Bayu Mangkurat<sup>c)</sup>,  
Jonathan Lampatar Siregar<sup>a)</sup>, Filda Rahmiati<sup>b)</sup>

<sup>a)</sup> Jakarta International University, Central Cikarang, Indonesia

<sup>b)</sup> President University, Cikarang Baru, Indonesia

<sup>c)</sup> International Women University, Bandung, Indonesia

<sup>\*)</sup>Corresponding Author: [lerissa.daniela@jiu.ac](mailto:lerissa.daniela@jiu.ac)

**Article history:** received 13 August 2024; revised 21 September 2024; accepted 21 October 2024

**DOI:** <https://doi.org/10.33751/jhss.v8i3.10776>

**Abstract.** This study focuses on the seaweed sector and women's economic empowerment while providing an outline of the Blue Economy idea and its current situation in Lancang island, Kepulauan Seribu, Indonesia. The Blue Economy is gaining popularity as a way to protect marine ecosystems while assuring nation's economic success and encourages the sustainable use of ocean resources. Indonesia, the biggest archipelago in the world, has a considerable blue economy potential. This research underlines the significance of striking a balance between economic expansion, the preservation of marine biodiversity, and the welfare of coastal communities. It emphasizes the responsibilities played by women in the seaweed sector and their restricted access to financial institutions. Furthermore, the study underlines the importance of additional research to improve long-term economic resilience by empowering women in the seaweed sector, contribute to long-term community development, and promoting financial inclusion. Though vital, seaweed women face several obstacles, including inadequate financial services and decision-making power. These constraints must be overcome to maximize the blue economy development. To conclude, financial inclusion, especially through cooperatives and digital financial services, is key to closing this gap. Indonesia and other nations can maximize the blue economy's potential while promoting sustainable development and empowerment by prioritizing financial inclusion.

**Keywords:** blue economy; coastal community; financial inclusion; seaweed industry; women empowerment; lancang island

## I. INTRODUCTION

The idea of the "Blue Economy (BE)" is becoming more and more well-liked as a plan of action for protecting the seas and water resources of the world [1]. The 2012 United Nations Convention on Sustainable Development (UNCSD), often known as the Rio+20 summit, is where the term "Blue Economy" first appeared. By highlighting the development prospects from the sustainable use of ocean resources, the idea tries to build on conceptions of a Green Economy that are rooted on land [2]. It emphasizes how the marine ecology; the ocean and coastal zone economic system have been planned and developed in concert. The term "Blue Economy" was first used by Gunter Pauli in 2010 to describe an idea of economic growth that takes into account the prudent local management of natural resources through fostering innovation, creativity, efficiency, and effectiveness without producing waste [3], [4]. Wenhai et al., (2019) also define the blue economy as sustainable productive, service, and all other connected activities using and safeguarding coastal and marine resources based on the characteristics. In addition, the guiding principles of the blue economy are those of natural

efficiency, and the backbone of national development and may sustainably include land- and sea-based socioeconomic growth [1], [6].

The basis of the blue economy is an approach to creating long-term prosperity by a nation or region that is suitable for the welfare of all its residents and the preservation of the environment, particularly the sea. The Sustainable Development Goals (SDGs) of the United Nations (UN) are meant to promote equitable society thus emphasize the need to balance the economic, social, and environmental aspects of sustainable development in regard to ocean resources. In addition, the World Bank highlight "balancing the triple bottom lines of sustainable development" as a crucial element of the BE in respect to oceans [7], while the concept of Blue Economy directly addresses "Life Below Water" [1]. Given that human and industrial activities have significantly damaged ocean conditions and frequently conflicting aims, such as pollution, unsustainable fishing, and ecological deterioration, it is challenging to achieve a balance in practice

### Study area and background information

Indonesia was the second-largest aquaculture production in 2020, with a volume of 14.8 million tons; 5.2

million tons of fish and 9.6 million tons of seaweed [8], [9]. Indonesia led the blue economy value added among ASEAN countries and was the world's second-largest seafood producer, following China, approximately 3.76 million households depends on this industry as their primary source of income [10]. Women have an important role across the seaweed value chain, from farming and harvesting to processing and marketing [11]. Women are the major seaweed producers in many Indonesian coastal villages, caring for the crops and assuring their development and quality, employed in post-harvest professions, and as the salesperson. This notion entails a dynamic strategy that incorporates ecological, economic, and environmental sustainability concepts. By accepting this comprehensive paradigm, Indonesia may aim for sustainable development that balances economic requirements, coastal community well-being, and gender equality.

Reported by Global Findex Database maintained by the World Bank, there are still over 1.7 billion women throughout the globe who do not have access to formal financial services because they do not have bank accounts [7]. This demonstrates a considerable gender difference in terms of access to financial services, which is a barrier to the economic empowerment of women. Women's empowerment via seaweed farming in Indonesia, is hampered by a lack of technical expertise and financial means to build a coastal agricultural system [12]. Furthermore, the lack of recognition of the important role that women play in the fisheries industry limits more women from participating and getting government economic support [13]. Despite their major contributions to the seaweed value chain, women in Indonesia encounter several obstacles in terms of financial inclusion which are; (1) inequitable compensation, (2) lack of representation in decision-making processes, and (3) limited access to essential assets and markets. Addressing these concerns is critical for establishing gender equality and promoting women's full economic participation in the seaweed sector.

## II. RESEARCH METHOD

As of this study, we sought coastal location in Pulau Lancang, Indonesia, that have an account seaweed production, with the majority of women involved. This research was conducted on August 2024, employs a qualitative method with field-based observation, interview and desk research method. Desk research, also known as secondary research, is a research process that entails acquiring and evaluating existing information from a variety of sources without undertaking direct primary data collection. Desk research entails gathering data from available resources by reviewing current literature, reports and data to investigate the importance of financial inclusion for women's empowerment in the context of seaweed industries. Hence, it is frequently seen as a cost-effective approach [14]. This study intends to provide insight on the possible advantages and obstacles related with financial inclusion of women in seaweed sectors

by performing a comprehensive evaluation of relevant literature [15]–[17]. This research will investigate how economically empowered women in this industry might help their overall empowerment as well as the broader socioeconomic development of coastal communities.

## III. RESULT AND DISCUSSION

In recent years, there has been an important rise in the number of coastline households engaged in seaweed cultivation in Indonesia, the production is done through community-based farming practices. The data indicates that mariculture is the aquaculture activity that contributes most to annual aquaculture production from 2015 to 2020, based on the type of aquaculture that is carried out. This is because seaweed is being produced at an increasing rate. The production of seaweed aquaculture shrinks by 3.10 percent in 2020 over 2015, still the largest commodity producer.

Table I. The Production Of Seaweed Aquaculture Shrinks

Species	Year						Increasing Average (%)	
	2015	2016	2017	2018	2019	2020	2015-2020	2019-2020
<b>Total</b>	<b>15,634,093</b>	<b>16,002,319</b>	<b>16,114,991</b>	<b>15,688,734</b>	<b>15,452,625</b>	<b>14,845,015</b>	<b>-1.01</b>	<b>-3.76</b>
Seaweed	11,269,342	11,050,301	10,456,043	10,320,202	9,775,986	9,618,421	-3.10	-1.61
Shrimp	615,871	692,568	1,150,405	911,857	863,119	881,599	10.92	2.14
Grouper	14,140	11,504	70,294	16,414	13,829	9,478	73.71	-31.46
Giant Seaperch	6,558	7,890	8,431	9,583	7,228	5,418	-1.76	-25.04
Milk Fish	625,341	747,445	636,825	875,592	824,239	811,883	6.97	-1.50
Common Carp	461,107	497,208	312,954	534,215	620,831	560,669	9.60	-9.69
Nile Tilapia	1,084,281	1,114,156	1,265,201	1,171,254	1,317,561	1,172,633	2.08	-11.00
Catfish	719,619	764,797	1,095,969	944,779	1,088,945	993,768	8.46	-8.74
Catfish	339,069	392,918	319,966	373,262	380,130	327,146	0.37	-13.94
Giant Gouramy	113,407	132,334	220,126	179,430	190,389	152,669	10.17	-19.81
Others	385,539	591,197	578,776	352,146	343,368	311,331	0.07	-9.33

Source: Kementerian Kelautan dan Perikanan (2022)

In South Sulawesi Province emerged as the primary hub for seaweed agriculture, while Nusa Tenggara surfaced as an escalating producer (Figure 1). The export value of Indonesian fresh seaweed is USD 1,168 per ton. Conversely, if the dye content is extracted, the commercial value escalates to around USD 13,372 per ton, representing an increase of approximately 13 times. Carrageenan, a hydrocolloid derived from seaweed, represents 87 percent of the overall national output, despite only 12 percent being attributed to jelly-producing varieties and a small quantity of other red seaweed types.

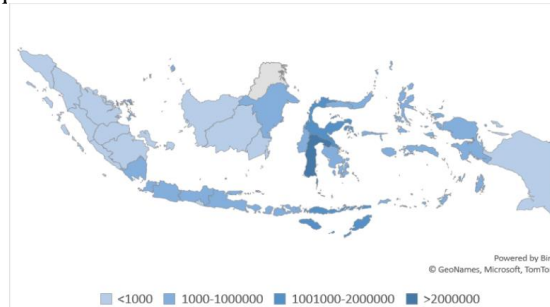


Figure. 1 Seaweed Production Base by Province in 2020  
Source: Badan Pembangunan Nasional (*Bappenas*) (2021)

Nevertheless, seaweed production faces some obstacles that must be addressed. The genetic quality of materials for the seaweed business requires enhancement, as seaweed cultivation is conducted genetically by cuttings due to a short season of growth and the reuse of the parent plants. The effects of climate change and the effectiveness of environmental conservation management also affect the quality of seaweed production [19].

#### **Study Area: Lancang Island, Kepulauan Seribu, Indonesia**

In our study area farming practices, men are mostly involved in on-farm work such as setting up seaweed lines, cleaning seaweed and marketing work such as putting seaweed into sacks and selling it. Women have actively participated in this rising trend, becoming vital contributors to the cultivation by tying seaweed and drying processes. Traditionally marginalized groups, they have grabbed this chance to produce revenue, contribute to the financial security of their family, and economically empower themselves.



Fig. 2 Women smallholder seaweed farmers in Lancang Island



Fig. 3 Field-based observation, Lancang Island seaweed production by community

One of the key factors affecting farmers' capacity to adapt to production and marketing challenges is their scale of production. This distribution of production is important because it means that only a small number of farmers produce the majority of seaweed. These large farmers typically rely heavily on hired labor, such as women, to support seaweed farming activities for tying seaweed seedlings to longlines. These large farmers benefit from access to large marine areas that they have claimed since seaweed farming began in the region. On the challenging aspects, seaweed farmers require financing for essential expenditures for procuring seeds. The current situation, financing primarily relies on personal savings and informal loans from traders, which can be returned under various and easy conditions, including at reduced seaweed prices. This situation caused women to fear obtaining loans from banks due to the complicated processes involved, reinforced by the absence of bank branches on the island. Farmers did not report seed production as a major issue, they focus more on the adverse and regular impacts of pests and heavy rainfall on the health of their seaweed. The aforementioned circumstance demonstrates that it continues to face numerous challenges regarding the financial inclusion of women in Indonesia and seaweed market expansion. Removing these obstacles able to unlock the potential that is hidden and allow women to play a more significant role in the growth of the blue economy [20].

#### **Blue Economy and financial inclusion; benchmarking**

Increase financial inclusion leads to better health outcomes, educational opportunities for children, and a reduction susceptibility to adverse monetary events among women and the families they support. The success stories of nations like Barbados, which implemented policy at different countries level; Norway, have implemented inter-institution collaboration at the state and regional government levels; the blue economy depends significantly on robust collaboration among enterprises, research and development organizations, personnel, and governmental bodies [21]. In Karunaratna study [22], it is believed, the low-income portion of society prefers obtaining financing from informal sources rather than conventional financial services. The gender gap in bank account access is highlighted in multiple prior studies, including Woldie [23], which indicate that lack of collateral, complex procedures, elevated interest rates, and an unfavorable business environment hinder SMEs from obtaining financing from official external sources. Adesua & Lincoln [24], recognized socio-cultural variables, the subordinate status of women, and gender discrimination stemming from tribal practices as elements that adversely affect women's financial inclusion. Added, Adetiloye et al., [25] identified loan conditions and education as critical factors that enhance female entrepreneurs' reliability and foster trust, hence facilitating sustainable access to credit. In order to reduce pressure on marine ecosystems and boost the economics of small rural coastal communities, the most recent Indonesian policy framework for coastal and marine policy interventions should call for adaptable approaches and the provision of alternative livelihood options [26], [27].

During a side event of the Commission on the Status of Women's 66th Session 2022, Sri Mulyani, a minister of Finance Republic Indonesia, stated that financial inclusion is identified as a critical aspect in achieving economic inclusivity, particularly for women. Promoting women's potential can have substantial economic ramifications, with far-reaching implications for the global economy, because women could create more jobs. This is especially important given that women own and operate many small and medium-sized businesses. Thus, emphasizes the necessity of ensuring women's financial inclusion by allowing them to create bank accounts and receive government transfers. Economic opportunities can be expanded by tackling this issue, resulting in improved economic stability and growth [28]. Financial inclusion mentions to the accessibility of individuals and businesses to affordable and relevant financial products and services that cater to their needs, such as transactions, payments, savings, credit, and insurance, all provided in a responsible and sustainable manner [29]. These cooperative organizations must provide financial services to underserved communities and empower them economically and socially [30], specifically in this context is women empowerment and blue economy. The benefits of cooperatives in financial inclusion comprises of the democratic ideals give all members equal voting rights in decision-making [31]. Inclusive method ensures involvement from those without mainstream financial access. Second, cooperatives offer savings, loans, insurance, financial education and skills training to their members. Cooperatives help members save, invest, and protect their assets by improving financial knowledge and management [32]. Increased access to financial services paves the way for women to launch enterprises, make investments in areas like as education and healthcare, and produce income, all of which contribute to the alleviation of poverty and the expansion of the economy.

In addition, cooperatives encourage community solidarity and collaboration will address economic issues. Should the standards be satisfied, the blue economy-financial development will promote local economic growth and reduce social inequality by focusing on agriculture, fishery, creative industries, and social services [33]. Products of cooperative offers underserved members low-interest microloans, competitive savings programs, and entrepreneurial skills training. It is believed cooperative members have secured and affordable access to capital and a robust network of collaboration that develops economic synergies and boosts market competitiveness. This program has improved cooperative members' finances and quality of life. According to Indonesia's 2045 Vision, the economic transformation aims to shift from a natural resource-dependent blue economy to a modern, competitive economy focused on manufacturing and services, enhancing value addition to guarantee prosperity and social justice for all Indonesians [21].

As financial inclusion awareness grows, cooperatives must play a larger role in developing financially equitable communities. Governments and stakeholders should promote and implement cooperative growth initiatives. Financial inclusion may provide wealth to everybody through

collaboration and active participation [34], [35]. To achieve this objective, capacity training for women must encompass enhancements in marine technology, production techniques to enhance product-derived from seaweed, financial and marketing management abilities. Subsequently the digitization of financial cooperatives, a critical component of the region's financial sector, is accelerating. Financial assistance conditions must be sufficiently flexible and correctly constructed for financial cooperatives to fully benefit. Access to professionals who can provide training, guidance, advice, and assistance is also more vital than financial resources.

#### IV. CONCLUSION

To conclude, this article highlights the significance of women's role in sustainable development and the potential benefits of gender equality in seaweed industry. While challenges and barriers exist for women smallholder farmers, they have shown resilience and implemented various adaptation strategies. Moving forward, future research should continue to view women as capable agents and maintain a gender perspective in examining these issues. There are numerous avenues for further exploration, including comparative studies between men and women, different countries, specific time periods, alternative associations of women beyond smallholder farmers, or different industries. It is crucial to recognize that women are not solely vulnerable victims but possess agency and should be empowered as active participants in sustainable development. By understanding and addressing their needs and capabilities, we can create more inclusive and equitable societies. As a result of financial inclusion programs such as cooperatives, the digitization of financial cooperatives, a crucial component of the region's financial industry. This research can assist guide future investigations and policymaking efforts by identifying existing knowledge gaps. It may highlight areas where more study is needed to improve knowledge and guide policies that increase women's financial inclusion in the seaweed sector. Furthermore, the findings can help decision-makers, such as government bodies and blue economy development organizations, devise targeted interventions and policies to optimize the beneficial impact of financial inclusion on women's empowerment and long-term economic growth. Subsequently, this qualitative-desk research is a first step in investigating the significance of financial inclusion for women's empowerment in seaweed industry. It offers several previous research benchmarking for future research and decision-making processes to harness the potential of seaweed as a significant resource for blue economy growth while maintaining gender equality and women's empowerment by reviewing current knowledge and identifying gaps in the literature.

#### REFERENCES.

- [1] K. H. Lee, J. Noh, and J. S. Khim, "The Blue Economy and the United Nations' sustainable

- development goals: Challenges and opportunities,” *Environ. Int.*, vol. 137, no. October 2019, p. 105528, 2020, doi: 10.1016/j.envint.2020.105528.
- [2] M. Voyer and J. van Leeuwen, “‘Social license to operate’ in the Blue Economy,” *Resour. Policy*, vol. 62, no. January, pp. 102–113, 2019, doi: 10.1016/j.resourpol.2019.02.020.
- [3] S. Mahardianingtyas, D. Adhetya Safitra, and A. Agustio, “A Blue Economy for Better Economic Development: A Case Study of East Nusa Tenggara, Indonesia,” vol. 89, no. Apbec 2018, pp. 165–173, 2019, doi: 10.2991/apbec-18.2019.22.
- [4] G. A. Pauli, *The blue economy: 10 years, 100 innovations, 100 million jobs*. Paradigm publications, 2010.
- [5] L. Wenhai *et al.*, “Successful blue economy examples with an emphasis on international perspectives,” *Front. Mar. Sci.*, vol. 6, no. JUN, pp. 1–14, 2019, doi: 10.3389/fmars.2019.00261.
- [6] N. Kathijotes, “Keynote: Blue Economy - Environmental and Behavioural Aspects Towards Sustainable Coastal Development,” *Procedia - Soc. Behav. Sci.*, vol. 101, pp. 7–13, 2013, doi: 10.1016/j.sbspro.2013.07.173.
- [7] World Bank, “The Potential of the Blue Economy,” *Potential Blue Econ.*, 2017, doi: 10.1596/26843.
- [8] T. B. H. Rahayu, “THE FUTURE OF SEAWEED IN INDONESIA Director General of Aquaculture Indonesia ’ s Position In Global Aquaculture Producer,” no. August, pp. 1–17, 2022.
- [9] FAO, *The State of Food and Agriculture: Overcoming Water Challenges in Agriculture*. 2020.
- [10] Ministry of National Development Planning, “Indonesia Blue Economy Roadmap,” 2023.
- [11] M. A. Rimmer, S. Larson, I. Lapong, A. H. Purnomo, L. Pong-Masak, P. R. Swanepoel, and N. A. Paul, “Seaweed aquaculture in Indonesia contributes to social and economic aspects of livelihoods and community wellbeing,” *Sustainability*, vol. 13, no. 19, p. 10946, 2021.
- [12] F. Sultana, I. Wahab, M. A. Nahiduzzaman, M. Mohiuddin, M., and M. M. Z., Shakil, A. Asaduzzaman, “Seaweed farming for food and nutritional security, climate change mitigation and adaptation, and women empowerment: A review,” *Aquac. Fish.*, vol. 8, no. 5, pp. 463–480, 2022, doi: <https://doi.org/10.1016/j.aaf.2022.09.001>.
- [13] L. Napitupulu *et al.*, “Trends in Marine Resources and Fisheries Management in Indonesia,” Jakarta, 2022. doi: [doi: 10.46830/wriipt.20.00064](https://doi.org/10.46830/wriipt.20.00064).
- [14] A. Turoń, K., & Kubik, “Business innovations in the new mobility market during the COVID-19 with the possibility of open business model innovation,” *J. Open Innov. Technol. Mark. Complex.*, vol. 7, no. 3, p. 195, 2021.
- [15] S. Larson *et al.*, “Women’s well-being and household benefits from seaweed farming in Indonesia,” *Aquaculture*, vol. 530, p. 735711, 2021, doi: 10.1016/j.aquaculture.2020.735711.
- [16] S. Larson, N. Stoeckl, M. A. Rimmer, and N. A. Paul, “Understanding feedback relationships between resources, functionings and well-being: A case study of seaweed farming and artisanal processing in Indonesia,” *Ambio*, vol. 51, no. 4, pp. 914–925, 2021, doi: 10.1007/s13280-021-01581-3.
- [17] P. G. M. Van Der Heijden *et al.*, “Seaweed in Indonesia: farming, utilization and research,” 2022.
- [18] Kementerian Kelautan dan Perikanan, “Marine and Fisheries in Figures,” 2022.
- [19] Badan Pembangunan Nasional (Bappenas), *Blue Economy Framework of Indonesia*. 2021.
- [20] I. Sualia and B. Julianto, “Women’s leadership in Indonesia’s modern seaweed processing industry,” 2023.
- [21] M. of N. D. P. D. P. Agency, “Indonesia Blue Economy Roadmap,” 2023.
- [22] T. J. C. Karunaratna and D. M. D. N. Dissanayake, “Financial inclusion on microfinance credits for poverty alleviation in Sri Lanka during the post-liberalization era. A desk exploration,” *Sri Lanka J. Co-op. Stud.*, vol. 02, no. 02, p. 2022, 2022.
- [23] A. Woldie, B. M. Laurence, and B. Thomas, “Challenges of finance accessibility by SMEs in the democratic republic of Congo: is gender a constraint?,” *Invest. Manag. Financ. Innov.*, no. 15, Iss. 2, pp. 40–50, 2018.
- [24] A. Adesua-Lincoln, “Assessing Nigerian female entrepreneur’s access to finance for business start-up and growth,” *African J. Bus. Manag.*, vol. 5, no. 13, p. 5348, 2011.
- [25] K. A. Adetiloye, F. B. Adegboye, and V. A. Akinjare, “Sustainable financial access for female entrepreneurs in the micro, small and medium enterprises sector in Nigeria,” *Cogent Soc. Sci.*, vol. 6, no. 1, p. 1823600, 2020.
- [26] D. Ferrol-Schulte, P. Gorris, W. Baitoningsih, D. S. Adhuri, and S. C. A. Ferse, “Coastal livelihood vulnerability to marine resource degradation: A review of the Indonesian national coastal and marine policy framework,” *Mar. policy*, vol. 52, pp. 163–171, 2015.
- [27] A. Phelan, L. Ruhanen, and J. Mair, “Ecosystem services approach for community-based ecotourism: towards an equitable and sustainable blue economy,” *J. Sustain. Tour.*, vol. 28, no. 10, pp. 1665–1685, 2020, doi: 10.1080/09669582.2020.1747475.
- [28] E. Sutrisno, “G20 Promotes Financial Inclusion for Women: Financial inclusion is a critical component in achieving economic inclusion, particularly for women,” *Indonesia.go.id*, 2022. .
- [29] World Bank, “ID4D-G2Px Annual Report,” *World Bank Gr.*, 2021.
- [30] T. W. Sutanto and T. Widiyastuti, “Peran Inklusi Keuangan Berkaitan dengan Produktifitas UMKM yang Menjadi Agen46 PT Bank Negara Indonesia (Persero) Tbk Kantor Cabang Blitar,” *J. Penelit.*

- Manaj. Terap.*, vol. 5, no. 2, pp. 116–127, 2020.
- [31] A. Périlleux, “The development of cooperative finance in southern countries; are cooperatives and banks complements or substitutes?,” 2011.
- [32] R. Wijaya and F. M. Hartini, “The Role of Financial Inclusion in Improving Community Welfare: A Study on Cooperative Business,” in *LePALISSHE 2021: Proceedings of the First Lekantara Annual Conference on Public Administration, Literature, Social Sciences, Humanities, and Education, LePALISSHE 2021, August 3, 2021, Malang, Indonesia*, 2022, p. 224.
- [33] R. K. Nayak, “Financial inclusion through cooperative banks: a feasible option for inclusive growth,” *Indore Manag. J.*, vol. 4, no. 3, pp. 9–17, 2012.
- [34] P. Lakshmi and S. Visalakshmi, “Impact of cooperatives in financial inclusion & comprehensive development,” *J. Financ. Econ.*, vol. 1, no. 3, pp. 49–53, 2013.
- [35] T. Lal, “Exploring the role of cooperatives in enhancing the social empowerment of rural households through financial inclusion,” *T INDIAN J. HE Commer.*, vol. 70, no. 2, 2017.